

PROJECT MANUAL

Contract Documents Specifications

VIRGINIAN RAILWAY PASSENGER STATION PHASE II – RESTORATION ROANOKE, VIRGINIA

**STATE PROJECT # EN05-128-325, C502
TEA-5128(319)
VDOT UPC# 103592
Tax Map # 4039003
Project Sponsor: City of Roanoke, Virginia**



10 CHURCH AVENUE, PLAZA SUITE 1 ROANOKE, VA 24011-2104
540.342.6001 (PH) 540.342.6055 (FAX)
WWW.SPECTRUMPC.COM

Project No. 12138

May 31, 2015

TABLE OF CONTENTS

BIDDING DOCUMENTS

- Notice of Invitation to Bid
- Invitation to Bid
- Instructions to Bidders
- Plan for Participation in Procurement Transactions of Small Businesses and Businesses Owned by Women and Minorities
- Bidder Checklist
- Bid Form
- Employment Projection Form
- Bid Bond

CONTRACT FORMS

- Contract
- Contractor's Performance Bond
- Contractor's Labor and Material Payment Bond
- Contractor's Certification as to Licensure of Subcontractors
- Certificate of Substantial Completion
- Affidavit of Payment of Claims
- Minority and Women-Owned Business Enterprise and Small Business Usage Status Form
- Certificate of Final Acceptance
- Mechanics Liens – Waiver Release

GENERAL REQUIREMENTS

- General Conditions
- Supplemental General Conditions

DIVISION 1 – PROJECT REQUIREMENTS:

- 01000 Special Conditions
- 01026 Schedule of Values
- 01027 Application for Payment
- 01110 Summary of Work
- 01200 Measurement and Payment
- 01310 Project Meetings
- 01350 Submittals
- 01400 Quality Requirements
- 01420 Reference Standards
- 01500 Temporary Facilities
- 01520 Field Offices and Sheds
- 01560 Barriers
- 01600 Material and Equipment
- 01770 Project Closeout
- 01785 Operation and Maintenance Data
- 01815 System Demonstration and Training

DIVISION 2 – EXISTING CONDITIONS:

02231 DEMOLITION
02300 EXCAVATION
02370 EROSION AND SEDIMENT CONTROL

DIVISION 4 – MASONRY:

04501 MASONRY RESTORATION

DIVISION 6 – WOODS AND PLASTICS:

06000 WOOD REHABILITATION WORK
06100 ROUGH CARPENTRY
06200 FINISH CARPENTRY

DIVISION 7 - THERMAL AND MOISTURE PROTECTION:

07605 SHEET METAL
07901 JOINT SEALANTS

DIVISION 8 – DOORS AND WINDOWS:

08212 STILE AND RAIL WOOD DOORS
08610 WOOD WINDOWS
08711 DOOR HARDWARE
08800 GLAZING

DIVISION 9 – FINISHES:

09200 LATH AND PLASTER
09255 GYPSUM BOARD ASSEMBLIES
09310 CERAMIC TILE
09900 PAINTING

DIVISION 10 – SPECIALTIES:

10 14 00 SIGNS
10 14 10 SPECIALTY SIGNAGE
10522 FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

DIVISION 12 – FURNISHINGS

12 93 00 SITE FURNISHINGS

DIVISION 15 – MECHANICAL:

15010 BASIC MECHANICAL REQUIREMENTS
15060 HANGERS AND SUPPORTS
15075 MECHANICAL IDENTIFICATION
15080 MECHANICAL INSULATION
15180 HEATING AND COOLING PIPING
15739 SPLIT SYSTEM AIR CONDITIONING UNITS
15810 DUCTS
15820 DUCT ACCESSORIES
15830 FANS
15850 AIR OUTLETS AND INLETS
15950 TESTING, ADJUSTING AND BALANCING

DIVISION 31 – EARTHWORK:

31 05 13 SOIL MATERIALS
31 05 16 AGGREGATE MATERIALS
31 09 00 GEOTECHNICAL ENGINEERING, INSPECTION AND TESTING
31 10 00 SITE PREPARATION AND CLEARING
31 22 13 ROUGH GRADING
31 23 16 EXCAVATING
31 23 17 UTILITY TRENCHING AND BACKFILLING
31 23 23 BACKFILLING
31 25 13 EROSION AND SEDIMENT CONTROL
31 31 16 TERMITIC CONTROL

DIVISION 32 – EXTERIOR IMPROVEMENTS:

32 12 16 ASPHALT PAVEMENT
32 13 13 PORTLAND CEMENT CONCRETE PAVEMENT
32 14 00 UNIT PAVING
32 17 13 PARKING BUMPERS
32 17 23 PAVEMENT MARKING AND SIGNAGE
32 31 19 DECORATIVE METAL FENCING
32 32 19 STONE MASONRY ASSEMBLY
32 91 19 LANDSCAPE GRADING
32 91 19.13 TOPSOIL
32 92 19 PERMANENT SEEDING
32 93 00 PLANTING

DIVISION 33 – UTILITIES:

33 05 13 PRECAST TRENCH DRAINS
33 11 16 WATER MAINS AND SERVICES
33 13 00 DISINFECTION OF WATER DISTRIBUTION SYSTEM
33 31 00 SITE SANITARY GRAVITY SEWER SYSTEM
33 41 00 SITE STORM DRAINAGE SYSTEM

APPENDIX A: Project Sign

APPENDIX B: Shop Drawing Submittal Transmittal

APPENDIX C: RFI

APPENDIX D: VDOT FORMS

APPENDIX E: NS Letter Agreement dated 05/21/2014 and the Entry Agreement for the period 8/1/14 to 12/31/15

APPENDIX F: Instructions Regarding Use of Disadvantaged Business Enterprises (DBE)

NOTICE OF INVITATION TO BID

ROANOKE CHAPTER, NATIONAL RAILWAY HISTORICAL SOCIETY
(NRHS or Roanoke Chapter)

Sealed Bids for:

**VIRGINIAN RAILWAY PASSENGER STATION
PHASE II – RESTORATION**

ROANOKE, VIRGINIA

The work of this contract consists of the general construction to complete the interior, exterior (including windows, soffits, gables and brickwork) landscaping and parking lot of the Virginian Railway passenger station.

**VDOT UPC# 103592
STATE PROJ # EN05-128-325, C502**

Sealed bids will be received by the Roanoke Chapter, NRHS by James Cosby, Renovation Committee Chair, c/o Spectrum Design, PC, 10 Church Avenue SE, Plaza Suite 1, Roanoke, Virginia 24011, at or before 2:00 p.m., local time, on **June 24, 2015**. Bids received after 2:00 p.m. will not be accepted or considered.

Copies of the documents may be downloaded from the Roanoke Chapter, NRHS's website at <http://www.roanokenrhs.org/vgncontractors.html>

A non-mandatory pre-bid conference will be conducted on **June 4, 2015**, at 10:00 a.m., local time, at Spectrum Design, 10 Church Ave SE, Roanoke, Virginia. A site visit will follow.

The Project and the work, services, and materials for such Project are subject to a Virginia Department of Transportation (VDOT or Department) Standard Project Administration Agreement dated March 18, 2008, between VDOT and the City of Roanoke (VDOT Agreement or Department Agreement), and various VDOT, local, State, and/or Federal terms and provisions as set forth therein or referred to therein and in the bid documents and/or any resultant contract documents.

Each entity submitting a bid must have and be able to demonstrate that such entity or its predecessor has a minimum of three (3) years experience in doing renovation work on historic masonry buildings, administered and inspected by Virginia state and/or local authorities, of similar size and value as the work requested in this Invitation to Bid (ITB).

Claims for withdrawal of bids shall only be made within two (2) business days after the opening of bids as set forth in Part (1) of Section 2.2 - 4330 (B), Code of Virginia (1950), as amended.

The Roanoke Chapter expressly reserves the right to cancel this ITB and/or reject any or all bids, to waive any informality or irregularity in the bids received, and to accept a bid which is deemed to be in the best interest of the Roanoke Chapter.

INVITATION TO BID

ROANOKE CHAPTER, NATIONAL RAILWAY HISTORICAL SOCIETY
(NRHS or Roanoke Chapter)

Sealed Bids for:

**VIRGINIAN RAILWAY PASSENGER STATION
PHASE II – RESTORATION**

ROANOKE, VIRGINIA

The work of this contract consists of the general construction to complete the interior, exterior (including windows, soffits, gables and brickwork) and site development improvements including utilities, walks, parking areas and landscaping of the Virginian Railway passenger station.

**VDOT UPC# 103592
STATE PROJ # EN05-128-325, C502**

Sealed bids will be received by the Roanoke Chapter, NRHS by James Cosby, Renovation Committee Chair c/o Spectrum Design, PC, 10 Church Avenue SE, Plaza Suite 1, Roanoke, Virginia 24011, at or before 2:00 p.m., local time, on June 24, 2015, at which time all bids received will be publicly opened and read. Bids received after 2:00 p.m. Bids received after 2:00 p.m. will not be accepted or considered. This project is generally described as set forth above.

Copies of the documents may be downloaded from the Roanoke Chapter's website at <http://www.roanokenrhs.org/vgncontractors.html>

All Contract Documents prepared and/or furnished by the Roanoke Chapter shall be the exclusive property of the Roanoke Chapter and shall not be used for any other project(s).

A non-mandatory pre-bid conference will be conducted on **June 4, 2015** at 10:00 p.m., local time, at Spectrum Design, 10 Church Ave S.E., Roanoke, Virginia. A site visit will follow. It is strongly recommended that all bidders attend this conference.

The Project and the work, services, and materials for such Project are subject to a Virginia Department of Transportation (VDOT or Department) Standard Project Administration Agreement dated March 18, 2008, between VDOT and the City of Roanoke (VDOT Agreement or Department Agreement), and various VDOT, local, State, and/or Federal terms and provisions as set forth therein or referred to therein and in the bid documents and/or any resultant contract documents.

All work, services, materials, and other items required for this Project shall be provided and performed in accordance with such VDOT Agreements, VDOT, local, State, and/or Federal documents included or referred to in the bid documents and/or any resultant contract, and in this ITB. Notwithstanding anything else in the ITB and/or the resultant contract, the Successful Bidder (Contractor) is hereby advised, and by submitting a bid for this Project agrees to comply with the VDOT and all the terms, provisions, and requirements of any VDOT, local, State, and/or Federal documents, rules, regulations, and procedures as may be set forth and/or referred to in the ITB and/or the resultant contract documents as well as any other applicable local, State, and/or Federal requirements that are now in existence or may hereafter be required for this Project.

Each Bidder is solely responsible for making sure that such Bidder has completely reviewed the bid documents as well as all referenced items and documents, including but not limited to the various terms and provisions set forth in the Supplemental General Conditions of the ITB.

Each entity submitting a bid must have and be able to demonstrate that such entity or its predecessor has a minimum of three (3) years experience in renovation work, on historic masonry buildings administered and inspected by Virginia state and/or local authorities, of similar size and value as the work requested in this ITB.

Bidders and all subcontractors are required to comply with all applicable city, state, and federal laws, ordinances, and regulations; and are required to be properly licensed under Sections 54.1-1100, et seq., Code of Virginia (1950), as amended. Bidders shall deposit with their bid a Bid Security executed in the amount and form stipulated in the Instructions to Bidders.

The Roanoke Chapter expressly reserves the right to cancel this ITB and/or reject any or all bids, to waive any informality or irregularity in the bids received, and to accept a bid which is deemed to be in the best interest of the Roanoke Chapter from the lowest responsive and responsible Bidder.

If an award of a contract is made, notice of the award, or the announcement of the decision to award, will be made by posting a notice of such award or announcement on the Roanoke Chapter website at <http://www.roanokenrhs.org/vgncontractors.html>

To determine the lowest responsive and responsible bidder who may be awarded a Contract for the Work, the criteria set forth in or requested pursuant to the Instructions to Bidders or in the Bid Documents may be considered.

By submitting a bid, each bidder agrees that this is a solicitation of bids and each bidder agrees to be solely responsible for the cost or expense of its bid and the Roanoke Chapter shall have no responsibility for such costs or expenses.

If a certain brand, make, item or manufacturer is specifically and exclusively required or called for in the plans, specifications, or other contract documents, then that brand, make, item, or manufacturer shall be used unless otherwise agreed to by the Roanoke Chapter, in its sole discretion.

Bids may not be withdrawn for a period of sixty (60) calendar days after the opening of bids unless the bid is substantially lower than the other bids because of a clerical error as defined in Section 2.2 - 4330, of the Code of Virginia (1950), as amended. Pursuant to Section 2.2 - 4330 (B)(1), the bidder shall give notice in writing and shall submit the original work papers with such notice to the Roanoke Chapter of its claim of right to withdraw the bid within two (2) business days after the opening of bids.

The successful bidder shall comply with the Code of Virginia nondiscrimination provisions of Section 2.2-4311 and the Drug-free workplace provisions of Section 2.2-4312.

Pursuant to Code of Virginia, Section 2.2 - 4343.1, be advised that the Roanoke Chapter does not discriminate against faith-based organizations.

Each bidder is solely responsible for ensuring that such bidder has the current complete version of the Bid Documents prepared for the matter, including any addenda issued by the Roanoke Chapter, NRHS, before submitting a bid.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

ROANOKE CHAPTER, NRHS
INSTRUCTIONS TO BIDDERS
TABLE OF CONTENTS

SECTION 1.	DEFINITIONS
SECTION 2.	EXAMINATION OF SITE AND CONTRACT DOCUMENTS
SECTION 3.	CLARIFICATION AND ADDENDA
SECTION 4.	TIME FOR COMPLETION
SECTION 5.	CONTRACTORS' LICENSES, PERMITS, FEES, AND TAXES
SECTION 6.	PREPARATION AND SUBMISSION OF BIDS
SECTION 7.	RECEIPT AND OPENING OF BIDS
SECTION 8.	BID SECURITY
SECTION 9.	INTENT
SECTION 10.	MATERIAL AND WORKMANSHIP
SECTION 11.	STATEMENT OF QUALIFICATIONS
SECTION 12.	ERRORS IN BIDS
SECTION 13.	REJECTION OF BIDS
SECTION 14.	ACCEPTANCE OF BIDS, EVALUATION OF BIDS, AWARD OF CONTRACT, AND SECURITY REQUIREMENTS
SECTION 15.	ETHICS IN PUBLIC CONTRACTING
SECTION 16.	BID PACKAGE CHECKLIST
SECTION 17.	PROTESTS
SECTION 18.	MISCELLANEOUS
SECTION 19.	SUPPLEMENTAL INSTRUCTIONS AND/OR ADDITIONAL INFORMATION FOR BIDDERS

ROANOKE CHAPTER, NRHS

INSTRUCTIONS TO BIDDERS

SECTION 1. DEFINITIONS

Definitions contained in Section 1 of the General Conditions are incorporated herein by reference. The bidder should refer to the General Conditions for definitions used in the Contract Documents. "Successful bidder" is defined as the bidder to whom the Roanoke Chapter, NRHS makes an award.

SECTION 2. EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- 2.1 Each bidder is responsible for examining carefully the site of the Work and the Contract and Bid Documents relating to the Work. By submitting a bid, the bidder acknowledges and agrees that it has examined and considered the conditions to be encountered at and adjacent to the site, the character, quality, and quantities of work to be performed, the material to be furnished, other requirements of the Contract Documents, and to have waived any claim or objection based thereon. Claims as a result of failure to have done such examination will not be considered by the Roanoke Chapter. See Section 8 of the General Conditions entitled "Conditions at Site."
- 2.2 Each bidder shall promptly notify, in writing, the Architect of any ambiguity, inconsistency, or error which may be discovered upon examination of the Invitation to Bid, any Bid Documents, and/or any related documents.

SECTION 3. CLARIFICATION AND ADDENDA

- 3.1 **Questions on Contract Documents:** All questions about the meaning or intent of the Contract Documents shall be directed to the Architect. Questions received less than seven (7) calendar days prior to the date for opening bids may not be answered. Bidders may only rely upon written addenda issued by the Architect and no other communication or interpretation, whether oral or written, shall have any effect or efficacy.
- 3.2 **Addenda:** Any changes, interpretations, or clarifications that may be made to the Contract Documents will be in the form of an addendum. Receipt by the bidder of such addendum shall be acknowledged on the Bid Form. **However, all Bidders are solely responsible for making sure that they have received and reviewed any and all addenda that may have been issued for this ITB.**
- 3.3 **Interpretation:** All decisions made in good faith by the Architect on the meaning or interpretation of the Contract Documents shall be final.

- 3.4 Bidders Responsibility:** All bidders are responsible for ensuring that they have received and examined all addenda that may have been issued before submitting their bid.

If you download this Invitation to Bid from the Roanoke Chapter, NRHS website and intend to submit a bid, you must notify the Architect that you should be added to the list of entities having received a copy of the Invitation to Bid and want to receive any addenda issued. The Roanoke Chapter, NRHS is not responsible for any Invitation to Bid obtained from any source other than the Roanoke Chapter, NRHS and may not accept bids from those who fail to notify the Roanoke Chapter, NRHS of their intent to submit a bid. Contact Chris Venable at Spectrum Design, P.C. 540.342.6001 cvenable@spectrumpc.com

- 3.5 Quantities:** Where the bid documents stipulate a unit price, the quantities of the work and material set forth in the proposal form or on the plans approximately represent the work to be performed and material to be furnished and are for the purpose of comparing the bids on a uniform basis. Payment shall be made to the Contractor only for the actual quantities of work performed or material furnished in accordance with the plans and specifications and it is understood that the quantities may be increased or decreased as provided in the General Conditions without in any way invalidating the bid prices.

SECTION 4. TIME FOR COMPLETION

- 4.1 Time for Completion:** Unless otherwise stated or a specific time period is set forth on the Bid Form, each bidder shall indicate in the appropriate blank the number of consecutive calendar days required by such bidder to complete the specified Work. However, no such time period may exceed the number of consecutive calendar days set forth in the Bid Form.
- 4.2 Weather:** The bidder, in preparing and submitting its bid, is required to take into consideration normal weather conditions. Normal weather means a range of weather conditions which might be anticipated, based on weather data for the past ten years. Unusual weather is weather which could not be anticipated based on such data. Normal weather conditions shall be determined from the public historical records available from the National Weather Service. The data sheets to be used shall be for the locality or localities closest to the site of the Work. No additional compensation will be paid to the Contractor because of unusual weather conditions; however, an extension of time for unusual weather may be considered by the Roanoke Chapter, NRHS as indicated in the General Conditions.
- 4.3 Liquidated Damages:** The amounts indicated on the Bid Form as step one and step two liquidated damages as described in the General Conditions (Section 21) shall be due from and paid by the Contractor to the Roanoke Chapter, NRHS for each consecutive calendar day of delay in excess of the stated time required to complete the Work, unless modified by Change Order.

SECTION 5. CONTRACTORS' LICENSES, PERMITS, FEES, AND TAXES

- 5.1 State License:** Bidders and all subcontractors are required to comply with all applicable city, state, and federal laws, ordinances, and regulations; and are required to be properly licensed in accordance with Sections 54.1-1100, *et seq.*, of the Code of Virginia, which presently requires one to be licensed as a "Class A Contractor" before submitting a bid of One Hundred Twenty Thousand Dollars (\$120,000) or more; or to be licensed as a "Class B Contractor" before submitting a bid of Seventy-five Hundred Dollars to One Hundred Twenty Thousand Dollars (\$7,500 to \$120,000); or to be licensed as a "Class C Contractor" before submitting a bid of One Thousand to Seventy-five Hundred Dollars (\$1,000 to \$7,500). There are also cumulative total amounts which can require a certain class of license and Bidders should check these requirements as well. Bidders shall show evidence of being properly licensed and supply the documents required in Section 14.4 of these Instructions to Bidders. (See also Section 7 of the General Conditions.)
- 5.2 Other Licenses, Permits, Fees, and Taxes:** Successful bidder is responsible for paying for all licenses, permits, fees, and taxes applicable to the project. Such charges and fees include, but are not limited to the applicable building permits, mechanical and electrical permits, hauling and dumping of material, and if work performed in the City of Roanoke during a calendar year exceeds Twenty-five Thousand Dollars (\$25,000), such bidder will have to possess a City business license and be responsible for paying City of Roanoke business license taxes. See Section 3 of the General Conditions.
- 5.3 Virginia State Corporation Commission:** Each Bidder/Offeror who is a stock or nonstock corporation, limited liability company, business trust, or a limited partnership or other business entity shall be authorized to transact business in the Commonwealth of Virginia as a domestic or foreign business entity if required by law. Each such Bidder/Offeror shall include in its bid response/proposal response the Identification Number issued to it by the Virginia State Corporation Commission (SCC) and should list its business entity name as it is listed with the SCC. Any Bidder/Offeror that is not required to be authorized to transact business in the Commonwealth as a domestic or foreign business entity as required by law shall include in its bid response/proposal response a statement describing why the Bidder/Offeror is not required to be so authorized. (See Va. Code Section 2.2-4311.2)

SECTION 6. PREPARATION AND SUBMISSION OF BIDS

- 6.1 Bid Form:** Bids shall be submitted on the Bid Form furnished, or copy thereof, and shall be completed and signed in ink. A copy of the Bid Form is bound in these specifications for the information of bidders only. A separate unbound copy of the Bid Form will be furnished to bidders for the purpose of submitting bids. Except as may be otherwise stated, all blank spaces in the Bid Form should be filled in and under no conditions shall any changes be made in the phraseology of the Bid Form. Erasures or other changes in a bid amount must be explained or noted over the initials of the bidder. Bids containing any conditions, omissions, unexplained erasures, alterations or items not called for in the bid documents, or irregularities of any kind, may be rejected by the Roanoke Chapter, NRHS as being incomplete and/or non-responsive. NO CHANGES MADE TO THE BID

FIGURES BY NOTATIONS ON THE OUTSIDE OF THE ENVELOPE WILL BE CONSIDERED IN THE REVIEW AND TABULATION OF BIDS OR FOR ANY OTHER PURPOSE.

- 6.2 Escrow:** In accordance with Section 2.2 - 4334, of the Code of Virginia, for bids of \$200,000 or more for construction of highways, roads, streets, bridges, parking lots, demolition, clearing, grading, excavating, paving, pile driving, miscellaneous drainage structures, and the installation of water, gas, sewer lines and pumping stations, the Bid Form will include a space for the bidder to indicate an option to use the escrow account procedure in order to have retained funds paid to an escrow agent. Otherwise, unless stated in the Supplementary General Conditions, no escrow will be provided.
- 6.3 Signatures:** Each bid must give the full business address of the bidder and be signed by bidder with its usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership or an authorized representative, followed by the signature and designation of the person signing. Bids by corporations must be signed with the legal name of the corporation followed by the name of the state in which they are incorporated and by the signature and designation of the president or other person authorized to bind it in the matter. The name of each person signing shall also be typed or printed below each signature. A bid by a person who affixes to his signature the word "President," "Authorized Agent," or other designation without disclosing such principal firm or employer, may be held to be the bid of the individual signing. Satisfactory evidence of the authority of the president or authorized agent signing on behalf of the corporation shall be furnished upon request by the Roanoke Chapter, NRHS.
- 6.4 Bid Amounts:** Bidders shall indicate in the appropriate blank spaces on the Bid Form the amounts for the base bid and any alternates, written with ink or typed, in both words and figures. In the event of a discrepancy between the words and figures expressed in the base bid or alternates, the word amount shall govern. Any unit prices for separate items as called for on the Bid Form shall be written with ink or typed in figures in the appropriate blanks.
- 6.5 Minority & Women-Owned Business Enterprise and Small Business Certification:** The bidder shall complete and submit the "Minority & Women-Owned Business Enterprise and Small Business Certification" form in the bid proposal. Failure to complete and sign this statement may result in rejection of the bid.
- 6.6 Bid Package Checklist:** Bidders shall deposit with their bid the documents or information set forth in the Bid Package Checklist. See Section 16.

SECTION 7. RECEIPT AND OPENING OF BIDS

- 7.1 Delivery of Bid:** It is the responsibility of the bidder to assure that its bid is delivered to the place designated for receipt of bids and prior to the time set for receipt of bids. No bids received after the time designated for receipt of bids will be considered.

- 7.2 Receipt of Bid:** The Bid Form, the Bid Security, and all other documents required to be submitted with the bid shall be enclosed in a sealed opaque envelope and addressed as follows:

James Cosby
Roanoke Chapter, NRHS
c/o Spectrum Design, PC
10 Church Avenue, SE
Plaza Suite 1
Roanoke, Virginia 24011

Place in front lower left-hand corner of envelope the project title as indicated at the top of the Invitation to Bid. Place in the upper left-hand corner of the envelope the bidder's name, mailing address, and Virginia Contractor number.

- 7.3 Opening of Bid:** Bids will be opened and read at the time and place stated in the Invitation to Bid. The contents may be made public in accordance with Section 2.2-4342 of the Code of Virginia. The officer or agent of the Roanoke Chapter, NRHS whose duty it is to open them, will decide when the specified time has arrived. No responsibility will be attached to any officer or agent for the premature opening of a bid not properly addressed and identified.
- 7.4 Withdrawing Bid:** After the date of opening of bids, no bid may be withdrawn for at least sixty (60) calendar days after such opening date, except as provided in Section 12 of these Instructions to Bidders.

SECTION 8. BID SECURITY

Each bid of \$100,000 or more must be accompanied by a Bid Security in an amount equal to five (5%) percent of the maximum possible bid price in accordance with Sections 2.2-4336 and 4338 of the Code of Virginia. The Bid Security shall be furnished in one of the following forms:

- a.** Bid Bond, in a form substantially as provided in the Contract Documents, made payable to the Roanoke Chapter, NRHS and properly executed by the bidder as Principal and a Corporate Surety authorized to transact business in the Commonwealth of Virginia. Attorneys-in-fact who execute Bid Bonds must file with the bond a certified copy of their Power of Attorney.
- b.** Certified Check or cash deposited with the Roanoke Chapter, NRHS in the face amount required for the Bid Security and made payable to the Roanoke Chapter, NRHS.
- c.** Personal Bond or Letter of Credit issued by an authorized financial institution in the face amount required for the Bid Security, made payable to the Roanoke Chapter, NRHS. These forms of security shall be submitted for review and must be approved by the Roanoke Chapter, in its sole discretion, at least three (3) working days prior to receipt of bids. Approval will be based upon a determination that the form of security offered will adequately protect the interests of the Roanoke Chapter, NRHS as equivalent to a corporate surety's bond.
- d.** For return of Bid Security, see Sections 13 and 14 of these Instructions to Bidders.

SECTION 9. INTENT

- 9.1 Work Required:** The Roanoke Chapter, NRHS requires that the successful bidder perform a complete and satisfactory job in accordance with the Contract Documents.
- 9.2 Conflicts in Contract Documents:** Anything called for by one of the Contract Documents and not called for by the others shall be of like effect as if required or called for by all Contract Documents. In the case of conflict between the Contract Documents, the Contract Documents shall take precedence in the following order: The Contract; addenda starting with the last issued addendum; the Supplementary General Conditions; the General Conditions; the Special Conditions; the specifications with attachments; and the drawings.
- 9.3 Work Not Described:** All work not specifically described in the Contract Documents, yet required to produce a fully functional and properly operating project shall be provided even though every item or minor detail for the proper installation or successful operation of the entire Work is not mentioned in the Contract Documents.
- 9.4 Completion of Work:** The successful bidder acknowledges and agrees that it has taken into account in its bid the requirements of the bid and Contract Documents, local conditions, availability of material, equipment, labor, and any other factors which may affect the performance of the Work. The successful bidder agrees and warrants that it will complete the Work not later than the time period or date indicated for completion.

SECTION 10. MATERIAL AND WORKMANSHIP

- 10.1 "Or Equal" Clause:** The particular brand, make of material, device, or equipment described in the Contract Documents establishes a standard of required function, economy of operation, dimension, appearance, and quality to be met by any proposed substitution. No substitution will be considered unless a written request for approval has been submitted by the bidder and has been received by the Architect at least ten (10) calendar days prior to the date for receipt of bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data, and any other information necessary or required by the Architect for an evaluation. A statement setting forth any changes in other material, equipment, or work that incorporation of the substitute would require shall be included. The burden of proof of merit of the proposed substitute is upon the bidder.
- 10.2 Approval of Substitution:** The Architect's decision of approval or disapproval of a proposed substitution shall be in his sole discretion and shall be final. If the Architect approves any proposed substitution, such approval will be set forth in an addendum issued to all recorded bidders. Bidders shall not rely on approvals made in any other manner.
- 10.3 Adaptation Due to Substitution:** The successful bidder shall be responsible for making all changes in the Work necessary to adapt and accommodate any equivalent product or item which it uses. The necessary changes shall be made at the successful bidder's sole expense.

SECTION 11. STATEMENT OF QUALIFICATIONS

Each bidder shall be prepared to submit evidence of qualifications, experience, and financial ability to perform the Work set forth in the Contract Documents, should such be required by the Contract Documents or requested by the Architect. Furthermore, each bidder must notify the Roanoke Chapter, NRHS if bidder has been terminated from any contract or job in the last three (3) years and/or if bidder has been during the last three (3) years debarred from bidding on or performing any federal, state or local procurement or job. If so, bidder must supply details of such matters by separate written statements included with bidder's response. Any bidder who is currently debarred will not be eligible to bid on this project.

SECTION 12. ERRORS IN BIDS

- 12.1 Withdrawal of Bid:** A bidder may withdraw its bid from consideration if the price bid was substantially lower than the other bids due solely to a mistake therein, provided the bid was submitted in good faith, and the mistake was a clerical mistake as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor, or material made directly in the compilation of a bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents, and material used in the preparation of the bid sought to be withdrawn.
- 12.2 Withdrawal Procedure:** The bidder shall give notice in writing and shall submit the original work papers with such notice to the Roanoke Chapter, NRHS of its claim of right to withdraw its bid within two (2) business days after the conclusion of the opening of bids as set forth in part (1) of Section 2.2 - 4330 (B), of the Code of Virginia.
- 12.3 Withdrawal Requirements:** Other applicable provisions of Section 2.2 - 4330, of the Code of Virginia shall apply to any errors in bids or any requested withdrawal due to errors in bids.

SECTION 13. REJECTION OF BIDS

- 13.1 Rejection of Bids:** The Roanoke Chapter, NRHS reserves the right to cancel the Invitation to Bid, to reject any or all bids, to reject the bid of a bidder who is not in a position to perform the contract, or to waive any informalities in any bid.
- 13.2 Bid Security Return for Rejected Bids:** The Bid Security will be returned to all rejected bidders after the Roanoke Chapter, NRHS and the successful bidder have executed the Contract.
- 13.3 Bid Security Return for Unsuccessful Bids:** Should a bid not be accepted by the Roanoke Chapter, NRHS within sixty (60) consecutive calendar days after the opening of bids, or within such other time specified in the Bid Documents, each bidder may obtain its Bid Security.

SECTION 14. ACCEPTANCE OF BIDS, EVALUATION OF BIDS, AWARD OF CONTRACT, AND SECURITY REQUIREMENTS

- 14.1 Acceptance of Bids:** Each bidder should submit with its bid documentation of bidder's legal name and indicate the type of business entity bidder is operating under; i.e., if a corporation, bidder should enclose a copy of the Certificate of Incorporation issued by the State Corporation Commission; if a partnership, bidder should enclose a copy of the relevant portions of the Partnership Agreement; if a limited liability company, bidder should enclose a copy of the Certificate of Organization.
- 14.2 Evaluation and Award to Lowest Responsive and Responsible Bidder:** To determine the lowest responsive and responsible bidder with respect to this bid, the following items may be considered so as to protect the interest of the Roanoke Chapter, NRHS:
- a. The total base bid price, plus the price of any alternates (additives) the Roanoke Chapter, NRHS elects to accept, if any. (This is where a lump sum amount is required.)
 - b. If a unit price contract is requested, the total amount based on the estimated quantities as set forth in the Bid Form will be considered. (The listed unit prices for each item will control and any multiplication errors may be adjusted by the Roanoke Chapter, NRHS using the proper estimated quantities.)
 - c. The ability, capacity and skill of the bidder to perform the contract or provide the services and/or items required.
 - d. Whether the bidder can perform the contract promptly and within the time specified, without delay or interference.
 - e. The character, integrity, reputation, judgment, experience and efficiency of the bidder.
 - f. The quality of performance of previous contracts or services.
 - g. The previous and existing compliance by the bidder with laws and ordinances relating to the contract, purchase or service.
 - h. The equipment and facilities available to the bidder to perform the contract or provide the services and/or items.
 - i. The sufficiency of the financial resources and ability of the bidder to perform the contract or provide the services and/or items.
 - j. The quality, availability and adaptability of the supplies, materials, equipment or services to the particular use required.
 - k. The ability of the bidder to provide future maintenance, parts and service for the use of the subject of the purchase or contract, if required.

- I. Bids shall be evaluated based on the requirements set forth in this Invitation to Bid, and other criteria to determine acceptability such as inspection, testing, quality, workmanship, delivery, suitability for a particular purpose and life cycle cost. The Roanoke Chapter, NRHS, in its sole discretion, may elect to waive informality in any bid.

Should a Contract be awarded to a bidder, it will be awarded to the lowest responsive and responsible bidder. If an award of a contract is made, notice of the award, or the announcement of the decision to award, will be made by posting a notice of such award or announcement on the Roanoke Chapter, NRHS website at <http://www.roanokenrhs.org/vgncontractors>

14.3 NOT USED

- 14.4 Contract Execution:** The successful bidder shall be required, within ten (10) consecutive calendar days after receipt of the Contract, to return the signed Contract, and furnish to the Roanoke Chapter, NRHS all other documents as enumerated hereinafter:

- a. Performance Security (if applicable)
- b. Labor and Material Payment Security (if applicable)
- c. Certificate of Insurance
- d. Escrow Agreement (if applicable)
- e. Contractor's Certification as to Licensure of Subcontractors Form
- f. Employment Projection Form (if applicable):

The successful bidder for a project requiring at least thirty (30) calendar days work will be required to submit a completed Employment Projection Form along with the signed Contract. A copy of this form is included in these bid documents. Completion of the form does not create an obligation on the part of the bidder to hire any referred applicant.

- 14.5 Security:** A Performance Security and a Labor and Material Payment Security each in the amount of one hundred percent (100%) of the contract amount for all contracts in excess of One Hundred Thousand Dollars (\$100,000) in accordance with Sections 2.2-4337 and 4338 of the Code of Virginia, shall be furnished by the successful bidder in one of the following forms:

- a. A Performance Bond and a Labor and Material Payment Bond, on forms as provided in the Contract Documents, made payable to the Roanoke Chapter, NRHS properly executed by the successful bidder as Principal and a Corporate Surety authorized to transact business in the Commonwealth of Virginia. Attorneys-in-fact who execute the bonds must file with each bond a certified copy of their Power of Attorney.

- b. Certified Checks or Cash Escrow in the face amount required for the Performance Security and the Labor and Material Payment Security each made payable to the Roanoke Chapter, NRHS.
- c. Personal Bond or Letter of Credit issued by an authorized financial institution in the face amount required for the Performance Security and the Labor and Material Payment Security, made payable to the Roanoke Chapter, NRHS. These forms of security must be approved by the Roanoke Chapter, NRHS, in his/her sole discretion. Approval will be based upon a determination that the form of security offered will adequately protect the interests of the Roanoke Chapter, NRHS as equivalent to a corporate surety's bond.

- 14.6 Escrow Agreement Form:** In the event the Contract meets the requirements as stipulated in Section 6.2 of these Instructions to Bidders and the successful bidder elects to use the escrow account procedure, the Escrow Agreement Form, as provided in the Contract Documents, shall be executed and submitted to the Roanoke Chapter, NRHS within fifteen (15) calendar days after receipt of written notification of bid acceptance. If the executed Escrow Agreement Form is not submitted within the fifteen-day period, the successful bidder shall forfeit and waive the rights to the use of the escrow account procedure.
- 14.7 Bid Security Return for Successful Bid:** Upon the execution of the Contract and approval of the Performance and Payment Securities, the Bid Security shall be returned to the successful bidder. Should the successful bidder fail or refuse to execute the Contract or furnish the required Performance and Payment Securities within the stipulated time, the Bid Security shall be due and paid to the Roanoke Chapter, NTHS and the Roanoke Chapter, NRHS shall be entitled to collect the Bid Security. In addition, the Roanoke Chapter, NRHS may pursue any and all other remedies available to it at law or in equity against said bidder.

SECTION 15. ETHICS IN PUBLIC CONTRACTING

The provisions, requirements, and prohibitions as contained in Sections 2.2 - 4367 through 2.2-4377, of the Code of Virginia, pertaining to bidders, offerors, contractors, and subcontractors are applicable to this project.

SECTION 16. BID PACKAGE CHECKLIST

The following items must be completed and included in your bid package. Failure to include all required forms may result in rejection of the bid.

- a. Completed Bid Form (all pages)
- b. Minority & Women-Owned Business Enterprise and Small Business Certification
- c. Properly Executed Bid Security (Bid Bond, Certified or Cashier's Check, etc., if applicable)
- d. In addition to the above items, bidder should submit documentation verifying bidder's proper legal name.
- e. Any other items that may be required by VDOT and any local, State, and/or Federal laws, rules, regulations, and/or agencies. The Bidder is solely responsible for submitting any such items.

SECTION 17. PROTESTS

Any bidder who wishes to protest or object to any award made or other decisions made pursuant to the Invitation to Bid may do so only in accordance with the provisions of Sections 2.2-4357, 4358, 4359, 4360, 4363, and 4364 of the Code of Virginia, and only if such is provided for in such Code section.

SECTION 18. MISCELLANEOUS

- a. No bidder shall confer on any public employee or Roanoke Chapter, NRHS Renovation Committee member having official responsibility for a purchasing transaction any payment, loan, subscription, advance, deposit or money, service, or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value is exchanged.
- b. The Roanoke Chapter, NRHS may make investigations to determine the ability of the bidder to perform or supply the services or items as described in this Invitation to Bid. The Roanoke Chapter, NRHS reserves the right to reject any bid if the bidder fails to satisfy the Roanoke Chapter, NRHS that it is qualified to carry out the obligations of the proposed contract.
- c. The successful bidder must comply with the nondiscrimination provisions of Section 2.2-4311 of the Code of Virginia, which are incorporated herein by reference.
- d. The successful bidder must comply with the drug-free workplace provisions of Section 2.2-4312 of the Code of Virginia, which are incorporated herein by reference.

- e. It is the policy of the Roanoke Chapter, NRHS to maximize participation by minority and women owned business enterprises and small businesses in all aspects of Roanoke Chapter, NRHS contracting opportunities.
- f. The successful bidder shall comply with all applicable City, State, and Federal laws, codes, provisions, and regulations.
- g. Providers of any outside services shall be subject to the same conditions and requirements as the successful bidder in regards to law, code or regulation compliance. The Roanoke Chapter, NRHS reserves the right of approval for any subcontract work, including costs thereof.
- h. This Invitation to Bid and all responses are subject to Section 2.2-4342 of the Code of Virginia regarding public inspection of records and the procedures a bidder must follow to protect trade secrets and proprietary information.
- i. Conflict of Interests Act. The provisions, requirements and prohibitions as contained in Sections 2.2-3100, et. seq. of the Code of Virginia are applicable to this Invitation to Bid.
- j. The procurement provisions of the Code of the City of Roanoke (1979), as amended, Sections 23.2-1, et. seq., as well as the City Procurement Manual, apply to this Invitation to Bid, unless specifically modified herein.
- k. Insurance. Successful bidder, and any of its subcontractors, shall, at its or their sole expense, obtain and maintain during the life of the resulting contract the insurance policies and bonds required. Any required insurance policies and bonds shall be effective prior to the beginning of any work or other performance by successful bidder, or any of its subcontractors, under any resultant contract. The policies and coverages required are those as may be referred to in the sample contract and/or the general conditions or other documents of this Invitation to Bid.
- l. Each bidder is to notify the Roanoke Chapter, NRHS if any of bidder's owners, officers, employees, or agents, or their immediate family members, is currently, or has been in the past year, an employee of the City of Roanoke or has any responsibility or authority with the City that might affect the procurement transaction or any claim resulting therefrom. If so, please provide the Roanoke Chapter, NRHS with the complete name and address of each such person and their connection to the City of Roanoke. Each bidder is advised that the Ethics in Public Contracting and Conflict of Interests Act of the Code of Virginia, as set forth in this Invitation to Bid, apply to this Invitation to Bid. Such information should be provided in writing before the bid opening date or may also be provided with the bid response.

SECTION 19. SUPPLEMENTAL INSTRUCTIONS AND/OR ADDITIONAL INFORMATION FOR BIDDERS

- a. VDOT requires that certain forms and documents be included in the ITB and any resultant contract for this Project. Therefore, these items together with any documents or items provided by the Roanoke Chapter, NRHS or referred to in any of the documents are intended to be and should be construed to be consistent with each other whenever possible. If a court or agency of competent jurisdiction determines that a conflict should exist between them, and to the extent of any such conflict, the VDOT documents shall take precedence unless any Federal and/or State rules, regulations, terms, and/or provisions shall require otherwise, in which case they will take precedence. Furthermore, each Bidder, as well as the Successful Bidder, shall notify the Architect, in writing, if any such conflict(s) should arise among the ITB and/or resultant contract documents and identify such conflict(s) to the Architect. References in any VDOT documents to State, VDOT, Department, and/or Department Engineer or similar terms shall also be deemed to include the Roanoke Chapter, NRHS and/or Architect where applicable and the Successful Bidder hereby acknowledges and agrees that the Roanoke Chapter, NRHS can enforce all such items against the Successful Bidder for this Project. Bidders are advised to refer to the other parts of the ITB, especially the Supplemental General Conditions, for further information on the above items.
- b. Bidders are advised that this ITB and any information or documents provided pursuant to this ITB are subject to the Virginia Freedom of Information Act and the Federal Freedom of Information Act and the Bidder must comply with the provisions of those Acts to protect any documents the Bidder may want protected from disclosure pursuant to the provisions of those Acts.

CITY OF ROANOKE, VIRGINIA

**Plan for Participation in Procurement
Transactions of Small Businesses and
Businesses Owned by Women and Minorities**

1. POLICY STATEMENT

It is the policy of the City of Roanoke to encourage participation by small businesses and minority-owned and women-owned business enterprises in all aspects of City contracting opportunities. In order to demonstrate its commitment to this policy, the procedures set forth in this document shall be followed whenever possible.

2. DEFINITIONS

A minority business enterprise (“MBE” or “MBES” in the plural form) is a business that is both owned and controlled by minorities. This means that minorities must own fifty-one percent of the business, and that they must control the management and daily operations of the business.

A women business enterprise (“WBE” or “WBES” in the plural form) is a business that is both owned and controlled by women. This means that women must own fifty-one percent of the business, and that they must control the management and daily operations of the business.

A small business (“SB” or “SBS” in the plural form) is a United States business that does not exceed fifty employees, is independently owned and operated, and is not dominant in its field or operation or an affiliate or subsidiary of a business dominant in its field of operation.

A minority is an individual who is a citizen or lawful resident of the United States and is Black, Hispanic, Asian American, American Indian, Alaskan Native or a member of another group who the Small Business Administration has determined is economically and socially disadvantaged under Section 8 (a) of the Small Business Act.

3. EMPLOYMENT DISCRIMINATION PROHIBITED

Every contract of over ten thousand dollars (\$10,000.00) to which the City is a party shall contain the provisions in subparagraphs (a) and (b) herein:

- (a) During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 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, advertisement and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
- (b) The contractor will include the provisions of the foregoing subparagraphs (a)(1), (2) and (3) in every subcontract or purchase order of over ten thousand dollars (\$10,000), with regard to the contract with the City, so that the provisions will be binding upon each subcontractor or vendor.

4. LIST OF MBES, WBES AND SBS

The City's Purchasing Division will establish and maintain a list of minority-owned and women-owned business enterprises. As appropriate, this list may include vendors at regional, state and national levels. A separate list of local MBES and WBES shall be established and, when established, be made available or the master list shall be searchable for local vendors. The local area shall consist of the Roanoke Valley, which shall include those areas included in the metropolitan statistical area as defined by the United States Office of Management and Budget for Census Bureau data purposes. The regional area shall include all cities, counties and towns, within the Commonwealth of Virginia, any part of which fall within a 50 mile radius of the City of Roanoke.

The City's Purchasing Division will establish and maintain a list of small businesses at the regional level.

The Purchasing Division shall serve as the primary contact for businesses to request to be added to the MBE/WBE list or the small business list and for businesses, organizations or individuals desiring access to the lists.

In maintaining these lists, the City's Purchasing Division will cooperate with the Virginia Department of Minority Business Enterprise, the United States Small Business Administration and other public or private agencies.

The Purchasing Division will maintain a list of agencies and organizations that provide assistance and/or education to MBES, WBES and SBS and inform such businesses of the resources available to them. The list will contain the types of services offered and contact information. The Purchasing Division will assist other organizations in publicizing training opportunities for MBES, WBES and SBS.

5. ALL CONTRACTS

In procuring goods and services for the City, all City employees shall follow the guidelines and mandates contained in the Purchasing Division's Procurement Manual with regard to solicitation of MBES and WBES.

When bids or proposals are solicited directly from potential contractors, solicitations shall include, when possible, appropriate businesses from the lists maintained by and/or available to the Purchasing Division, including but not limited to the list from the Virginia Department of Minority Business Enterprise.

All solicitation, addenda and award actions over \$30,000 shall be posted on the City of Roanoke's web site <http://www.roanokeva.gov>

Invitation to Bid solicitation notices over \$50,000 and Requests for Proposals estimated to be over \$30,000 shall be advertised in both The Roanoke Times and The Roanoke Tribune whenever possible. Such Invitation to Bid solicitation notices and Requests for Proposals shall also be advertised on RVTV.

6. CONSTRUCTION CONTRACTS

This paragraph shall apply to all construction contracts whenever advertising of the Invitation to Bid is required.

The bid documents will contain a list of, or a reference to a list of, MBES, WBES and SBS. The list will be provided to assist and encourage the general contractors' use of the listed businesses as subcontractors.

The City will provide a copy of the plans and specifications for all construction projects to the Southwest Virginia Community Development Fund, F. W. Dodge of Roanoke, and Valley Construction News plan room(s) so that MBES, WBES and SBS can review the documents. The documents will also be available for review, at no charge, at the Office of the City Engineer.

The City Engineer, the Purchasing Manager and the Project Engineer will require that general contractors make a "best or good faith effort" to seek the participation of and utilize MBES, WBES and SBS as suppliers and subcontractors. General contractors will be required to show that they have made efforts to recruit MBES, WBES and SBS by incorporating into the bid or proposal form:

- a. Statements indicating efforts to negotiate with MBES, WBES and SBS and the results of such efforts. Bidders will be required to list those MBES, WBES and SBS from whom quotations for labor, materials, and/or services have been solicited, and state which MBES, WBES and SBS, if any, the contractor will use on the project if awarded the bid; and
- b. A certification that the contractor has made a good faith effort to utilize MBES, WBES and SBS whenever possible.

A bid response that does not contain such statements and certification will be deemed non-responsive and will be rejected.

If the contractor listed MBES, WBES and/or SBS that it would use on the project if awarded the bid and the contractor is awarded the bid, the contractor will be required to use his or her best efforts to utilize the MBES, WBES and SBS identified by the contractor unless the contractor can demonstrate a nondiscriminatory, sound, business reason for not using the MBE, WBE or SB. The City Engineer, in his or her sole discretion, will determine whether or not the contractor has demonstrated a nondiscriminatory, sound, business reason.

The contractor, in every monthly request for payment, shall submit a status report of MBE, WBE, and SB participation in the project to date. Payment shall not be issued to the contractor until such status report is submitted.

The Purchasing Manager will closely monitor the requirements of this section.

7. RACIAL DISCRIMINATION IN CONSTRUCTION CONTRACT BONDING AND INSURANCE

In construction contracting, if any person is found by the City Manager or a designee to have engaged in discrimination on the basis of race or gender in the granting of bonds or insurance to persons who contract with or desire to contract with the City, or to persons who receive subcontracts or desire to receive a subcontract in connection with a City contract, the person shall be deemed unqualified to submit a bond or insurance for any City construction contract unless and until the City Manager or designee determines that the discrimination has been purged and that adequate assurances have been made that it will not recur. Any determination by the City Manager of a violation of this section shall be reported in writing to City Council.

8. FEDERAL, STATE OR OTHER GRANT REQUIREMENTS

In addition to the provisions of this Plan, when the City is using funds subject to federal, state or other grant requirements with regard to MBES, WBES and/or SBS, the City's Department managing the specific solicitation will take all necessary affirmative steps to assure that the requirements of the grant or program are met.

9. ECONOMIC DEVELOPMENT

The Department of Economic Development will assist the Purchasing Division by providing MBES, WBES and SBS with information regarding the resources available to them and by referring such businesses to the Purchasing Division for additional information.

The Department of Economic Development will also include MBES, WBES and SBS in any programs it has to introduce and familiarize businesses with opportunities in the City.

10. DEBARMENT

Any offeror or bidder, or any principal thereof or person associated therewith, found to have engaged in substantial and intentional misrepresentation concerning either good faith MBE, WBE and/or SB participation efforts or its status as a minority owned, women owned or small business shall be debarred from any City contracting for a period of two (2) years. This debarment shall also extend to any successor firm substantially controlled or managed, whether directly or indirectly, by any debarred individual. This determination shall be made by the City Manager or a designee; and any debarment shall be reported in writing to Council.

11. REPORTING

The Purchasing Manager shall, at the conclusion of each fiscal year, report to the City Manager for report to City Council on the Purchasing Division's compliance with this Plan and efforts made pursuant to the Plan. The report shall also include the level of participation by MBES, WBES and SBS in contracts that have been awarded by the City through formal solicitations during that fiscal year.

ROANOKE CHAPTER, NRHS
ROANOKE, VIRGINIA

BIDDER CHECKLIST OF FORMS TO BE COMPLETED
BY EACH BIDDER AND SUBMITTED WITH BID RESPONSE

NOTE: The Bidder Checklist is only intended to be an aid to the Bidder. There could be other documents or forms that may also need to be completed and submitted with the bid response as required by the various VDOT documents referred to in the Supplemental General Conditions. Each Bidder shall carefully review the VDOT documents and references and complete and submit any required forms and/or information whether or not such forms are listed on the Bidder Checklist. The Bidder Checklist is for information purposes only and the Roanoke Chapter, NRHS is not responsible if any required forms are not listed.

**VIRGINIAN RAILWAY PASSENGER STATION
PHASE II – RESTORATION**

BIDDER CHECKLIST FOR BIDS

The items listed below shall be completed and submitted with the Bidder's response.

This form should be completed and returned with the bid. Failure to return this form may be cause for considering the bid nonresponsive.

	Bidder Check Off	Chapter Check Off
1. Completed Bid Form (all pages)	<hr/>	<hr/>
2. Minority & Women-Owned Business Enterprise and Small Business Certification	<hr/>	<hr/>
3. Properly Executed Bid Security (Bid Bond, Certified or Cashier's Check, etc., if applicable)	<hr/>	<hr/>
4. Documentation verifying bidder's proper legal name (Document to be provided by Bidder)	<hr/>	<hr/>
5. DBE Statement	<hr/>	<hr/>
6. DBE Good Faith Efforts Documentation (VDOT-Form C-49)	<hr/>	<hr/>
7. Minimum DBE Requirements (VDOT – Form 111)	<hr/>	<hr/>
8. Affidavit of No Collusion (VDOT – Form C-104)	<hr/>	<hr/>
9. Debarment and Suspension Certification (VDOT – Form C-105)	<hr/>	<hr/>
10. Buy America (Use of Domestic Material)	<hr/>	<hr/>
11. Lobbying Certification	<hr/>	<hr/>
12. Davis Bacon and Copeland Act Statement	<hr/>	<hr/>

Legal Name of Bidder

Authorized Signature

Date

Print Name and Title

DOCUMENT 09**BID FORM**

Job Title (Hereinafter Project):

Virginian Railway Passenger Station Phase II – Restoration

VDOT #103592

State Project #EN05-128-325, C502

Location:

Roanoke, Virginia

To: Mr. James Cosby, Chairman Virginian Station Restoration Committee
Roanoke Chapter, National Railway Historical Society (NRHS)
c/o
Spectrum Design
10 Church Ave SE
Plaza Suite 1
Roanoke, VA 24011

Date: _____

Submitted by: _____
(full name)

(full address) _____

1. BASE BID (including the following parts but excluding work in Additive Bid Items):

The undersigned, as bidder, hereby declares that the only person or persons interested in this proposal as Principal or Principals is/are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without connection with any other person, company, or parties making a bid or proposal; and that it is, in all respects, fair and in good faith without collusion or fraud.

The bidder further declares that he has examined the Place of the Work and informed himself fully in regard to all conditions pertaining to the place where the work is to be done; that he has examined all matters referred to in the Instructions to Bidders and the Contract Documents relative thereto prepared by Spectrum Design, P.C. for the above mentioned project; and that he has satisfied himself relative to the work to be performed within the established time.

He proposes and agrees, if this proposal is accepted, to contract with the Owner in the form of contract specified to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor, and pay all State and local sales taxes necessary to complete the Project in full and complete accordance with the shown, noted,

described and reasonably intended requirements of the Contract Documents with a definite understanding that no money will be allowed for extra work except as set forth in the Contract Documents, for the following amount:

_____ Dollars (\$ _____).

ADDITIVE BID ITEMS:

ADDITIVE BID ITEM 1: Stone Sign Wall and Freestanding Sign, in accordance with the drawings and specifications is

_____ Dollars (\$ _____).

ADDITIVE BID ITEM 2: Donor Brick, Timber Walk, and Concrete Bench, in accordance with the drawings and specifications is

_____ Dollars (\$ _____).

ADDITIVE BID ITEM 3: Additional Landscaping, in accordance with the drawings and specifications is

_____ Dollars (\$ _____).

ADDITIVE BID ITEM 4: Ticket Office Cabinetry, in accordance with the drawings and specifications is

_____ Dollars (\$ _____).

Contract award will be based **ONLY** on the **TOTAL BASE BID AMOUNT shown above** (including any properly submitted bid modifications). Additive Bid Items shall be taken in **ANY** sequence as the Owner in its discretion decides to award.

The bidder has relied upon the following public historical climatological records freely available from the National Oceanic and Atmospheric Administration website <http://cds.noaa.gov> for data for Roanoke, VA.

We have included the security Bid Bond as required by the Instruction to Bidders.

All applicable federal, state and local taxes are included in the Bid Sum.

2. CONTRACT TIME:

The undersigned agrees, if awarded contract by within sixty (60) days after Bid Date, that all work under this contract shall be substantially completed and accepted by the Owner within 210 days after Notice to Proceed, 30 days after substantial completion for final completion, and 30 days following final completion for project closeout and further agrees that from the compensation of otherwise to be paid, the Owner will retain liquidated damages as stipulated in Article 4 of the Contract and this sum is not to be considered in any case a penalty.

3. CONTRACT SECURITY:

The undersigned agrees, if awarded the contract, to furnish and deliver to the Owner an executed performance and payment bond in accordance with the requirements of the Contract Documents.

4. PROPOSAL ACCEPTANCE:

If undersigned is notified of proposal acceptance within **sixty (60)** days following opening of bids, he agrees to:

- execute a contract for work for compensation stated in the bid form and in the form of agreement referenced in the Project Manual within **twenty (20)** days after date of Notice of Award,
- Furnish the required Contract Security above within **twenty (20)** days of receipt of Notice of Award.
- Commence work within **sixty (60)** days of receipt of Notice of Award.

5. BID GUARANTEE:

The undersigned agrees to requirements of the Contract Documents relative to "Bid Guarantee". This bid may be rejected if not accompanied by a guarantee in the specified amount. Any certified checks may be uncollected at the risk of bidders submitting them.

If undersigned fails to commence work or provide required bonds, the security Bid Bond shall be forfeited as damages to the Owner by reason of this failure.

In the event the bid is not accepted within the time stated above, the required security Bid Bond will be returned to the undersigned, in accordance with the provisions of the Instruction to Bidders, unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

6. ADDENDUM/BULLETIN RECEIPT: The undersigned acknowledges receipt of the following addenda numbered:

Addendum # _____, dated _____
Addendum # _____, dated _____
Addendum # _____, dated _____

7. LIST OF MECHANICAL AND ELECTRICAL CONTRACTORS:

<u>Phase of Work</u>	<u>Person or Firm</u>
1. HVAC _____	_____
2. Plumbing _____	_____
3. Electrical _____	_____

8. Provide with the completed Bid Form, the Bidder Checklist for Bids and the forms and statements listed therein.

9. BID FORM SIGNATURES:

Signed: _____
(Signature of your authorized signing officer, title)

Name: _____
(Print the full name of your authorized signing officer, title)

For: _____
(Bidder - Print the full name of your firm, company or corporation)

State of Incorporation: _____

Date: _____, 20_____

(business mailing address – 3 lines provided)

(seal)

If a bidder is a joint venture or partnership, add additional forms of execution for each member in the appropriate form or forms as above.

If a contract is for seventy thousand dollars (\$70,000) or more, or if the total value of all construction, removal, repair or improvements undertaken by the bidder within any twelve-month period is five hundred thousand dollars (\$500,000) or more, the bidder is required under Title 54, Chapter 11, Code of Virginia (1950) as amended, to show evidence of being licensed as a "Class A Contractor." If a contract is fifteen hundred dollars (\$1,500) or more but less than seventy thousand dollars (\$70,000), the bidder is required to show evidence of being licensed as a "Class B Contractor." The bidder shall place on the outside of the envelope containing the bid and shall place in the bid over his signature whichever of the following notations is appropriate:

"Licensed Class A Virginia Contractor No. _____ "

"Licensed Class B Virginia Contractor No. _____ "

Date

END OF BID FORM

ROANOKE CHAPTER, NRHS

EMPLOYMENT PROJECTION FORM
(Please Print or Type)

*** SUBMIT WITH SIGNED CONTRACT ***

EMPLOYER NAME _____ PROJECT _____

CONTACT PERSON _____ PHONE NUMBER _____

EMPLOYMENT PROJECTIONS FOR PROJECT

Completed form(s) must be submitted to City for projects lasting thirty (30) calendar days or longer.

INSTRUCTIONS FOR COMPLETING FORM: (Refer to Section 14.4 of Instructions to Bidders.) Please complete for each separate job title of all covered positions to be hired during the project. Covered positions include entry level jobs that are not managerial, highly technical, or professional. Completion of form does not create an obligation on the part of the bidder to hire any referred applicant.

Job Title					
# Openings					
Rate of Pay (Specify Hr./ Day/Wk./Mo.)					
# Hrs. Work per Week					
Working Hours					
Working Days					
Projected Start Date					

SPECIAL REQUIREMENTS (If Any)

License/Cert.					
VA Drivers License					
Tools (List)					
Transportation					
Physical Requirement					
Educational Requirement					
Other					

ROANOKE CHAPTER, NRHS

BID BOND

KNOW ALL MEN BY THESE PRESENTS, THAT WE, THE UNDERSIGNED, _____, as Principal, and _____, as Surety, are hereby held and firmly bound unto _____, as Roanoke Chapter or Owner, in the penal sum of _____ (\$_____) for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. Signed, sealed, and delivered this ____ day of _____, 20____.

The condition of the above obligation is such that whereas the Principal has submitted to the _____ a certain bid, attached hereto and hereby made a part hereof, to enter a contract in writing for the _____.

NOW, THEREFORE, if the bid shall be rejected, or if the bid shall be accepted and the Principal shall execute and deliver to the Roanoke Chapter a Contract in the Form of Contract contained in the proposed Contract Documents, properly completed in accordance with the bid, and shall furnish bond for his faithful performance of the Contract and for the payment of all persons performing labor or furnishing materials in connection herewith within the specified time period, and shall in all other respects perform the agreement created by the acceptance of the bid, 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 penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of the Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Roanoke Chapter may accept such bid; and the Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunder set their hands and seals, 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.

Attest: _____ (SEAL)
Principal

By _____
Title _____

Witness to signature of
Attorney-in-Fact: _____ (SEAL)
Surety

By _____
Witness _____ Attorney-in-Fact

(Attorneys-in-fact affix seal and attach current original or certified copy of power of attorney.)

Project: Virginian Station – Phase II

Bid Bond
Rev. 12/07/2010

ROANOKE CHAPTER, NATIONAL RAILWAY HISTORICAL SOCIETY

CONTRACT

THIS CONTRACT, is dated this _____ day of _____, 20____, between _____, hereinafter referred to as the "Contractor", and the Roanoke Chapter, NATIONAL RAILWAY HISTORICAL SOCIETY (NRHS), hereinafter referred to as the "Roanoke Chapter" or "Owner";

WITNESSETH:

THAT, WHEREAS, the Contractor has been awarded a contract by the Roanoke Chapter, NHRS for the restoration of the Virginian Railway Passenger Station Phase II: Restoration to include the general construction to complete interior, exterior (including windows/soffits, gables and brickwork) landscaping and parking lot, all in a proper and timely manner and in accordance with the Contract Documents, hereinafter and in the Contract Documents referred to as the "Work"; and

WHEREAS, the Project and the work, services, and materials for such Project are subject to a Virginia Department of Transportation (VDOT or Department) Standard Project Administration Agreement dated March 18, 2008, between VDOT and the City (VDOT Agreement or Department Agreement), and various VDOT, local, State, and/or Federal terms and provisions as set forth therein or referred to therein and in the bid documents and/or any resultant contract documents; and

WHEREAS, the Contractor has entered into a performance and a payment bond, with surety, each in the penalty of One Hundred Percent (100%) of the Contract sum, payable to the Roanoke Chapter as required by the Contract Documents;

NOW, THEREFORE, THIS AGREEMENT WITNESSETH:

ARTICLE 1.

That, for and in consideration of the sums of money hereinafter specified to be paid by the Roanoke Chapter to the Contractor for the Work provided in the Contract Documents to be performed by the Contractor, the Contractor hereby covenants and agrees with the Roanoke Chapter to fully construct, perform, and complete the Work in a good and workmanlike manner in accordance with the Contract Documents to produce a fully functional and properly operating project within the time stipulated, time being made of the essence of this Contract; it being agreed by the parties hereto that the Contract Documents consist of this Contract and those items set forth in the definition of Contract Documents in Section 1 of the General Conditions and includes the following, all of which are and constitute a part of this Contract as if attached hereto or set out in full herein, viz:

Invitation to Bid contained in the Project Manual dated _____

Instructions to Bidders dated tbd

General Conditions dated tbd

Supplemental General Conditions, if any, as contained in the Project Manual dated _____

Addendum No. _____ dated _____

Project: Virginian Station – Phase II

Plans and Drawings as contained or listed in the Project Manual dated _____

Specifications as contained in the Project Manual dated _____

Special Conditions or similar documents, if any, as may be contained in the Project Manual dated _____

Bid Form completed by Contractor for this project

Ordinance No. _____ adopted _____

Contractor's Performance Security

Contractor's Labor and Material Payment Security

Escrow Agreement, if any

Virginia Department of Transportation (VDOT or Department) Standard Project Administration Agreement dated March 18, 2008

ARTICLE 2. CONTRACT SUM.

The Roanoke Chapter covenants and agrees to pay the Contractor for the Contractor's complete and satisfactory performance of the Work, in the manner and at the times set out in the Contract Documents, in current funds, the Contract Sum of Dollars (\$_____), as provided for in the Contract

Documents and as the Contract Sum may be increased or decreased by additions and/or reductions in the Work or as the Contract Sum may be decreased by the Roanoke Chapter's assessment of liquidated damages against Contractor, or by setoff or as provided for in the Contract Documents or as allowed by law.

ARTICLE 3. TIME OF COMMENCEMENT AND COMPLETION.

The Contractor shall commence the Work to be performed under this Contract on such date as is established and fixed for such commencement by written notice to proceed given by the Engineer to the Contractor, and the Contractor covenants and agrees to fully construct, perform, and complete the Work within _____ (_____) consecutive calendar days after the date of commencement fixed and established by such notice. The Contractor further agrees that the Work shall be started promptly upon receipt of such notice and shall be prosecuted regularly, diligently, and uninterruptedly at a rate of progress that will ensure full completion thereof in the shortest length of time consistent with the Contract Documents.

ARTICLE 4. LIQUIDATED DAMAGES.

Roanoke Chapter and Contractor recognize that time is of the essence in the completion of the Work and that Roanoke Chapter will suffer loss or damages if the Work is not completed within the period of time stipulated above, plus any extensions thereof allowed in accordance with the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving the actual loss or damages suffered by Roanoke Chapter if the Work is not completed on time. Accordingly, if such Work is not fully and satisfactorily completed within the period of time set forth in Article 3, the Contractor agrees it shall owe to and pay to the Roanoke Chapter as liquidated damages for loss of full use or occupancy of the Work, but not as a penalty, the sum of Five Hundred Dollars (\$500.00) as liquidated damages for each consecutive calendar

day during which full and satisfactory completion of the Work is delayed or exceeds the number of days provided for in this Contract to complete the Work. Contractor further agrees that any liquidated damages Roanoke Chapter assesses against Contractor may also be withheld by Roanoke Chapter from any retainage or other sums Roanoke Chapter may otherwise owe to Contractor. Contractor hereby waives any defense as to the validity of any liquidated damages stated herein on the grounds such liquidated damages could be void as penalties or are not reasonably related to actual damages. All such liquidated damages are in addition to any other damages the Roanoke Chapter may be entitled to recover from Contractor.

ARTICLE 5. PAYMENT FOR WORK.

Construction estimates for payment, including the final payment request, submitted by the Contractor shall be in accordance with the provisions of Sections 20, 21, and 22 of the General Conditions and such other provisions of the Contract Documents that may be applicable. Final payment will not be made until the Work has been fully and satisfactorily completed, the Contract duly performed, and Certificate of Final Acceptance has been issued by the Architect, all as provided for in the Contract Documents.

ARTICLE 6. NONWAIVER.

Contractor agrees that the Roanoke Chapter's waiver or failure to enforce or require performance of any term or condition of this Contract or the Roanoke Chapter's waiver of any particular breach of this Contract by the Contractor extends to that instance only. Such waiver or failure is not and shall not be a waiver of any of the terms or conditions of this Contract or a waiver of any other breaches of the Contract by the Contractor and does not bar the Roanoke Chapter from requiring the Contractor to comply with all the terms and conditions of the Contract and does not bar the Roanoke Chapter from asserting any and all rights and/or remedies it has or might have against the Contractor under this Contract or by law.

ARTICLE 7. FORUM SELECTION AND CHOICE OF LAW.

By virtue of entering into this Contract, the Contractor submits itself to a court of competent jurisdiction in the City of Roanoke and further agrees that this Contract is controlled by the laws of the Commonwealth of Virginia and that all claims, disputes, and other matters shall only be decided by such court according to the laws of the Commonwealth of Virginia, except pertaining to the conflict of laws.

ARTICLE 8. SEVERABILITY.

If any provision of this Contract, or the application of any provision hereof to a particular entity or circumstance, shall be held to be invalid or unenforceable by a court of competent jurisdiction, the remaining provisions of the Contract shall not be affected and all other terms and conditions of the Contract shall be valid and enforceable to the fullest extent permitted by law.

ARTICLE 9. NONDISCRIMINATION.

A. During the performance of this Contract, the Contractor agrees as follows:

1. The Contractor will not discriminate against any Subcontractor, employee, or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by State law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees

- and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
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 employment 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 section.
- B. The Contractor will include the provisions of the foregoing Subsections A (1), (2), and (3) in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

ARTICLE 10. COMPLIANCE WITH STATE LAW, FOREIGN AND DOMESTIC BUSINESSES AUTHORIZED TO TRANSACT BUSINESS IN THE COMMONWEALTH OF VIRGINIA:

Contractor shall comply with the provisions of Virginia Code Section 2.2-4311.2, as amended, which provides that a contractor organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 or as otherwise required by law. Contractor shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the Contract. The Roanoke Chapter may void the Contract if the Contractor fails to remain in compliance with the provisions of this section.

ARTICLE 11. ENTIRE CONTRACT.

This Contract is an entire and integrated contract and is not severable, except as set forth in Article 8, and may be modified only by written agreement properly executed by the parties.

ARTICLE 12. COMPLIANCE WITH FEDERAL IMMIGRATION LAW:

Contractor agrees that Contractor does not, and shall not during the performance of this Contract, knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.

ARTICLE 13. COMPLIANCE WITH VDOT AGREEMENT AND OTHER DOCUMENTS.

All work, services, materials, and other items required for this Project shall be provided and performed in accordance with such VDOT Agreement, VDOT, local, State, and/or Federal documents included or referred to in the bid documents and/or this Contract, and in the ITB. Notwithstanding anything else in the ITB and/or in the Contract, the Contractor is advised, and hereby agrees to comply with the VDOT Agreement and all the terms, provisions, and requirements of any VDOT, local, State, and/or Federal documents, rules, regulations, and procedures as may be set forth in and/or referred to in the ITB and/or in this Contract as well as any other applicable local, State, and/or Federal requirements that are now in existence or may hereafter be required for this Project. Furthermore, Contractor shall incorporate this Contract and the VDOT Agreement into all subcontracts and tiers of subcontracts for this Project.

ARTICLE 14. CONTRACT SUBJECT TO FUNDING.

This Contract is or may be subject to funding and/or appropriations from federal, state and/or local governments and/or agencies and/or from the Council of the City of Roanoke. If any such funding is not provided, withdrawn, or otherwise not made available for this Contract, the Contractor agrees that the Roanoke Chapter may terminate this Contract on 7 days written notice to Contractor, without any penalty or damages being incurred by the Roanoke Chapter. Contractor further agrees to comply with any applicable requirements of any grants and/or agreements providing for such funding.

ARTICLE 15. INCORPORATION OF VDOT, LOCAL, STATE, AND/OR FEDERAL TERMS.

The preceding terms and provisions include certain standard terms and conditions required by VDOT, Local, State, and/or Federal agencies, whether or not expressly set forth in the ITB and/or the Contract provisions. All contractual provisions required by VDOT, Local, State, and/or Federal agencies involved in this Project are hereby incorporated by reference. Anything to the contrary notwithstanding, all Federal, VDOT, State, and/or Local mandated terms shall be deemed to control in the event of a conflict with other provisions contained in the Contract with the order of precedence being in that order unless otherwise required by law. The Contractor agrees to and shall not perform any act, fail to perform any act, or refuse to comply with any request that would cause the Roanoke Chapter to be in violation of any Local, VDOT, State, and/or Federal terms and conditions.

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

Attest/Witness:

Typed Name of Contractor

By
President/Vice-President; Partner or Owner

Typed or Printed Name and Title

Typed or Printed Name and Title
(Contractor's Corporate Seal)

Attest/Witness:

ROANOKE CHAPTER, NRHS

By _____

Typed or Printed Name and Title

Typed or Printed Name and Title

**Appropriation and Funds Required
for this Contract Certified**

Director/Deputy Director of Finance _____

Date: _____

Account #: _____

Approved as to form:

City Attorney/Assistant City Attorney _____

Approved as to execution:

City Attorney/Assistant City Attorney _____

ROANOKE CHAPTER, NRHS
CONTRACTOR'S PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

that _____

(Insert full name or legal title and address of Contractor)

as Principal, (hereinafter referred to as "Contractor"),

and _____

(Insert full name or legal title and address of Surety)

Telephone: _____ Fax: _____

as Surety (hereinafter referred to as "Surety"), are held and firmly bound unto the Roanoke Chapter, NRHS, a 501c3 non-profit organization , as Obligee (hereinafter referred to as "City" or "Owner"), in the amount of _____

Dollars (\$ _____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents to the terms of this bond.

WHEREAS, Contractor has entered into a Contract with the Roanoke Chapter dated ___, 20_____, incorporating certain specifications and drawings prepared by:

(Insert full name or legal title and address)

(which Contract, specifications, drawings, and other Contract Documents are hereinafter referred to collectively as the "Contract") for a fully functional and properly operating project, namely _____

which Contract is expressly incorporated herein by reference and made a part of this bond.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Contractor shall promptly and faithfully perform the Contract, in strict conformity with each and every requirement of the Contract, then this obligation shall be null and void; otherwise, this Performance Bond shall remain in full force and effect and is subject to the following conditions:

- a. Any alteration which may be made in the terms of the Contract, including, without limitation, the amount to be paid or the work to be done under it, or the giving by

Project: Virginian Station – Phase II

Contractor's Performance Bond

Rev. 12/07/2010

the Roanoke Chapter of any extension of time for the performance of the Contract or any other forbearance of any nature whatsoever on the part of either the Roanoke Chapter or the Contractor to the other shall not in any way release the Contractor and the Surety, or either of them, their heirs, executors, administrators, successors, or assigns from their liability hereunder, and notice of such alteration, extension, or forbearance is hereby expressly waived by Surety.

- b. IT IS NOT INTENDED BY ANY OF THE PROVISIONS OF ANY PART OF THIS BOND TO CONFER A BENEFIT UPON ANY OTHER PERSON OR ENTITY NOT A PARTY TO THIS PERFORMANCE BOND OR TO AUTHORIZE ANY PERSON OR ENTITY NOT A PARTY TO THIS BOND TO MAINTAIN A SUIT PURSUANT TO THE TERMS OR PROVISIONS OF THIS BOND OTHER THAN THE ROANOKE CHAPTER OR ITS SUCCESSORS OR ASSIGNS.
- c. The Surety hereby submits itself to a court of competent jurisdiction in Roanoke, Virginia, and agrees that any suit or action hereunder shall be brought only in a Virginia court of competent jurisdiction in the City of Roanoke or in the United States District Court for the Western District of Virginia, Roanoke Division, and not elsewhere.
- d. Any suit under this bond must be instituted within one (1) year after (i) completion of the Contract, including the expiration of all warranties and guarantees, or (ii) discovery of the defect or breach of warranty, if the action be for such, in all other cases.
- e. The provisions of this bond shall be governed by and interpreted to be consistent with the laws of the Commonwealth of Virginia.

SIGNED AND SEALED this _____ day of _____, 20_____, in the presence of:

WITNESS:

CONTRACTOR

By: _____ (Seal)

(Type Name and Title)

WITNESS:

SURETY

By: _____ (Seal)
Attorney-in-Fact

(Type Name and Title)

(Attorneys-in-fact affix seal and attach original or certified copy of current power of attorney.)

ROANOKE CHAPTER, NRHS

CONTRACTOR'S LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

that _____

(Insert full name or legal title and address of Contractor)

as Principal, (hereinafter referred to as "Contractor"),

and _____

(Insert full name or legal title and address of Surety)

Telephone: _____ Fax: _____

as Surety (hereinafter referred to as "Surety"), are held and firmly bound unto the Roanoke Chapter, NRHS , as Obligee (hereinafter referred to as "Roanoke Chapter" or "Owner"), for the use and benefit of Claimants as herein below defined, in the amount of _____

Dollars (\$_____), for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents to the terms of this bond.

WHEREAS, Contractor has entered into a Contract with the Roanoke Chapter dated ___, 20_____, incorporating certain specifications and drawings prepared by:

(Insert full name or legal title and address)

(which Contract, specifications, drawings, and other Contract Documents are hereinafter referred to collectively as the "Contract") for providing a fully functional and properly operating project, namely _____

which Contract is expressly incorporated herein by reference and made a part of this bond.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Contractor shall promptly make payment to all Claimants, as hereinafter defined, for all material

Project: Virginian Station – Phase II

Contractor's Labor and
Material Payment Bond
Rev. 12/07/2010

furnished or labor supplied or performed in the prosecution of the work provided for in the Contract, then this obligation shall be void; otherwise this Labor and Material Payment Bond shall remain in full force and effect and is subject to the following conditions:

- a. Any alteration which may be made in the terms of the Contract, including, without limitation, the amount to be paid or the work to be done under it, or the giving by the Roanoke Chapter of any extension of time for the performance of the Contract or any other forbearance of any nature whatsoever on the part of either the Roanoke Chapter or the Contractor to the other shall not in any way release the Contractor and the Surety, or either of them, their heirs, executors, administrators, successors, or assigns from their liability hereunder, and notice of such alteration, extension, or forbearance is hereby expressly waived by Surety.
- b. A Claimant is defined as one who has and fulfills a contract to supply labor or materials, or both, to the Contractor or to any of the Contractor's subcontractors, in the prosecution of work provided for in the Contract, labor and material being construed to include, without limitation, public utility services and reasonable rentals of equipment, but only for periods when the equipment rented is actually used at the site, or who may otherwise be allowed by law to file a claim against the Contractor and/or Surety.
- c. The Contractor and Surety hereby jointly and severally agree with Roanoke Chapter that every Claimant, as defined in paragraph b, who has performed labor or furnished material in accordance with the Contract in the prosecution of the work provided for in the Contract and who has not been paid in full therefore before the expiration of ninety (90) days after the day on which such Claimant performed the last such labor or furnished the last of such materials for which Claimant claims payment, or as may otherwise be allowed by law, may bring an action on this payment bond to recover any amount due Claimant for such labor or material, and may prosecute such action to final judgment and have execution on the judgment. The Contractor and Surety expressly agree that Roanoke Chapter shall not be liable for the payment of any judgment, costs, or expenses resulting from any such suit and that neither Contractor nor Surety shall cause Roanoke Chapter to be named as a party in any such suit.
- d. The Contractor and Surety hereby jointly and severally agree with Roanoke Chapter that every Claimant, as defined in paragraph b, who has direct contractual relationship with any subcontractor from whom the Contractor has not required a subcontractor payment bond but who has no contractual relationship, express or implied, with such Contractor, may bring an action on this bond only if the Claimant has given written notice to the Contractor within one hundred eighty (180) days from the day on which the Claimant performed the last of the labor or furnished the last of the materials for which payment is claimed, stating with substantial accuracy the amount claimed and the name of the person for whom the work was performed or to whom the material was furnished, or as may otherwise be allowed by law. The Contractor and Surety expressly agree that Roanoke Chapter shall not be liable for the payment of any judgment, costs, or expenses resulting from any such suit and that neither Contractor nor Surety shall cause Roanoke Chapter to be named as a party in any such suit.
- e. The Surety hereby submits itself to a court of competent jurisdiction in Roanoke, Virginia, and agrees that any suit or action hereunder by any Claimant shall be

brought only in a Virginia court of competent jurisdiction in and for the City of Roanoke, or in the United States District Court for the Western District of Virginia, Roanoke Division, and not elsewhere.

- f. Any suit or action hereunder shall be brought within one year after the day on which the person bringing such action last performed labor or last furnished or supplied materials.
- g. The provisions of this bond shall be governed by and interpreted to be consistent with the laws of the Commonwealth of Virginia.

SIGNED AND SEALED this _____ day of _____, 20_____, in the presence of:

WITNESS:

CONTRACTOR

By: _____ (Seal)

(Type Name and Title)

WITNESS:

SURETY

By: _____ (Seal)
Attorney-In-Fact

(Type Name and Title)

(Attorneys-in-fact affix seal and attach current original or certified copy of power of attorney.)

ROANOKE CHAPTER, NRHS

CONTRACTOR'S CERTIFICATION AS TO LICENSURE OF SUBCONTRACTORS

**THE VIRGINIAN RAILWAY PASSENGER STATIONPHASE II
ROANOKE, VIRGINIA**

Contractor agrees to comply with Title 54.1, Chapter 11, Code of Virginia (1950), as amended, with respect to licensure of subcontractors employed to work on the Project. Contractor represents that it has verified that all subcontractors, currently identified to work on the Project, hold all required State and local licenses, including State contractors license and City business license. Contractor agrees that it will verify that any additional subcontractors employed to work on the Project, subsequent to the date of this Certification, hold all required State and local licenses, including State contractors license and City business license. This Certification shall constitute a material part of the Contractor's contract with the Roanoke Chapter, NRHS.

Contractor's Name

By _____

Printed or Typed Name and Title

COMMONWEALTH OF VIRGINIA

CITY/COUNTY OF _____

I, _____, a Notary Public in and for the Commonwealth of Virginia, do hereby certify that _____, whose name is signed to the foregoing, has subscribed, sworn to and acknowledged the same before me this _____ day of _____, 20_____.

Notary Public

My Commission expires: _____

Project: Virginian Station – Phase II

Contractor's Certification as to
Licensure of Subcontractors
Rev. 12/07/2010

ROANOKE CHAPTER, NRHS

CERTIFICATE OF SUBSTANTIAL COMPLETION

The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Architect/Engineer and/or Roanoke Chapter when construction is sufficiently complete, in accordance with the Contract Documents, so the Roanoke Chapter, NRHS (Roanoke Chapter or Owner) can occupy or utilize the Work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

ARCHITECT/ENGINEER: _____

BID NUMBER: _____ DATE OF ISSUANCE: _____

PROJECT: _____

CONTRACTOR: _____

PROJECT OR DESIGNATED PORTION SHALL INCLUDE: _____

The Work or portion thereof designated above performed under this Contract has been reviewed and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby established as _____.

The Roanoke Chapter will assume possession thereof at _____ a.m./p.m. on that date.

A list of items ("punch list"), prepared by the A/E and/or Roanoke Chapter, to be completed or corrected by the Contractor, is attached hereto. 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. The Contractor will complete any portion of the Work that is not substantially complete and will complete or correct the work on the punch list in accordance with the Contract Documents.

The establishment of a date of substantial completion and/or the acceptance of the Work or designated portion thereof does not relieve the Contractor of any responsibility for any faulty materials or workmanship or operate to relieve the Contractor or its Surety from any obligation under the Contract with the Roanoke Chapter, NRHS or the Performance Bond or Labor and Material Payment Bond.

This Certificate is subject to the terms and conditions of the Contract Documents, including but not limited to Section 20.8 of the General Conditions.

Architect/Engineer	By _____	Date _____
Contractor	By _____	Date _____
Roanoke Chapter, NRHS Owner	By _____	Date _____

Project: Virginian Station – Phase II

ROANOKE CHAPTER, NRHS
AFFIDAVIT OF PAYMENT OF CLAIMS

By: _____

(Insert Exact Name and Address of Firm)

This day _____ personally appeared before me,
_____, a Notary Public in and for the City (County) of
_____, and, being by me first duly sworn states that all subcontractors
and suppliers of labor and materials have been paid all sums due them for work performed or
materials furnished in the performance of the Contract between the Roanoke Chapter, NRHS,
and _____, Contractor, dated _____, 20_____, for

or arrangements have been made by the Contractor satisfactory to such subcontractors and
suppliers with respect to the payment of such sums as may be due from the Contractor to the
subcontractors and suppliers.

CONTRACTOR: _____

BY: _____

PRINTED OR TYPED NAME AND TITLE: _____

Commonwealth of Virginia at Large:

Subscribed and sworn to before me this ____ day of _____, 20_____.
My commission expires on the ____ day of _____.

_____ Notary Public

_____ Printed Name of Notary Public

ROANOKE CHAPTER, NRHS

MBE/WBE/SB USAGE STATUS FORM

UPDATED FORM TO BE SUBMITTED WITH EACH REQUEST FOR PAYMENT AND A FINAL SUMMARY FORM TO BE SUBMITTED WITH THE FINAL REQUEST FOR PAYMENT.

Section I:

Bid No: _____ Date: _____

Project: _____

Prime Contractor: _____

List all MBE/WBE/SB contractors or subcontractors and/or suppliers used to date and indicate what type of entity it is (i.e. MBE or WBE or SB):

_____ Amount to Date: _____

_____ Amount to Date: _____

_____ Amount to Date: _____

Attach additional sheet if necessary.

Section II:

Total Project Value to Date: _____

Total MBE/WBE/SB Value to Date: _____

Percent MBE/WBE/SB Work to Date: _____

Section III:

I hereby certify that the above figures are true and reflective of the amount of MBE/WBE/SB work used on this project to date.

Legal Name of Contractor

Typed or Printed Name and Title

Signature

Date

ROANOKE CHAPTER, NRHS
CERTIFICATE OF FINAL ACCEPTANCE

This Certificate is subject to the terms and conditions of the Contract Documents, including but not limited to Section 20.8 of the General Conditions. The Roanoke Chapter, Contractor, and A/E, if applicable, hereby agree that the date fixed for Final Acceptance of the Work by the Roanoke Chapter, NRHS is _____.

The establishment of a date of Final Acceptance and/or the acceptance of the Work does not relieve the Contractor of any responsibility for any faulty materials or workmanship or operate to relieve the Contractor or its Surety from any obligation under the Contract with the Roanoke Chapter or the Performance Bond or Labor and Material Payment Bond.

ARCHITECT/ENGINEER: _____

PROJECT NUMBER: _____

PROJECT: _____

CONTRACTOR: _____

Architect/Engineer	By	Date
Contractor	By	Date
Roanoke Chapter, NRHS	By	Date
Roanoke Chapter	By	Date

COMMONWEALTH OF VIRGINIA)
)ss
COUNTY/CITY OF ROANOKE)

Original Contract Amount: \$ _____
Approved Change Order: \$ _____
Adjusted Contract Amount: \$ _____
Completed to Date: \$ _____
Retention at 5%: \$ _____
(Completed Less Retention) \$ _____
Previous Payments: \$ _____
Current Payment: \$ _____
Contract Balance: \$ _____

TO: _____ (Title Insurer)
Valley Bank _____ (Lender)
Roanoke Chapter, NRHS _____ (Owner)
_____ (Contractor)

WAIVER AND RELEASE OF MECHANIC'S LIENS

WHEREAS, the undersigned, _____ ("General Contractor"), a Virginia Corporation, whose principal place of business is _____ has been employed by Roanoke Chapter, National Railway Historic Society ("Owner"), under an expressed (or implied) contract to furnish labor and/or materials and/or services and/or equipment for the buildings (or improvement) located in the City of Roanoke, State of Virginia, and described as: Virginian Railway Passenger Station, Phase II, Restoration Completion (the "Project").

NOW, THEREFORE, upon the delivery to General Contractor of checks payable to said entity or individual in the total sum of \$ _____, the undersigned does hereby waive and release any and all liens, or claims of lien, or right of withhold, stop notices, equitable liens and labor and material bond rights against the Project, the premises and the building (or improvements), on account of labor and/or materials and/or services and/or equipment furnished by the undersigned to the date hereof [or through _____] for said building (or improvement) or said premises; and the undersigned does further release and forever discharge the Owner of the property on which the project is located, from any and all claims, demands, actions or causes of action arising out of labor and/or materials and/or services and/or equipment furnished by the undersigned to the date hereof for the Project, buildings (or improvement) or said premises.

General Contractor hereby agrees to indemnify and hold harmless the Owner, the Owner's construction lender, and their successors, assigns, and sureties, against all losses, costs, damages or expense, by reason of any liens, claims, or demands which anyone may have for labor performed, or for material or equipment furnished to the Project by, through or under General Contractor, through the date hereof as it relates to the funds received, but not as it relates to the retention or contract balance not presently due to General Contractor.

The UNDERSIGNED, respectfully warrants that the contract status set forth above is an accurate statement, and no other sums are claimed, that all laborers, subcontractors, and suppliers employed by him have been paid all sums previously due and will be paid all current sums due out of this payment and that none of such laborers, subcontractors or suppliers is or will be entitled to claim or assert any claim against the above described real estate or the improvements thereon for labor or materials furnished to or for the account of the undersigned.

This waiver and release shall be binding upon the assignees, heirs, administrators, and executors of the undersigned.

This is a (check one) PARTIAL FINAL release.

Dated this _____ day of _____, 20_____

_____, Contractor

By: _____
Its: _____ and Authorized Agent

The foregoing Waiver and Release of Mechanic's Liens was signed and sworn before me this
____ day of _____, 20_____, by _____, _____ (title),
an authorized agent for _____, Contractor.

My commission expires: _____.

Notary Public

ROANOKE CHAPTER, NRHS

GENERAL CONDITIONS

TABLE OF CONTENTS

- SECTION 1. DEFINITIONS**
- SECTION 2. INDEMNITY PROVISION**
- SECTION 3. REGULATIONS AND PERMITS**
- SECTION 4. CONTRACTORS' AND SUBCONTRACTORS' INSURANCE**
- SECTION 5. EMPLOYMENT AND CONDUCT OF PERSONNEL**
- SECTION 6. EMPLOYMENT DISCRIMINATION BY CONTRACTOR PROHIBITED**
- SECTION 7. SUBCONTRACTORS**
- SECTION 8. CONDITIONS AT SITE**
- SECTION 9. SURVEYS AND LAYOUT**
- SECTION 10. DRAWINGS AND SPECIFICATIONS**
- SECTION 11. SCHEDULE OF THE WORK**
- SECTION 12. CONSTRUCTION SUPERVISION**
- SECTION 13. STANDARDS FOR MATERIAL INSTALLATION AND WORKMANSHIP**
- SECTION 14. SUBMITTALS**
- SECTION 15. INSPECTION AND INDEPENDENT TESTING**
- SECTION 16. USE OF PREMISES AND REMOVAL OF DEBRIS**
- SECTION 17. PROTECTING PERSONS AND PROPERTY**
- SECTION 18. DAMAGES TO THE WORK AREA**
- SECTION 19. CHANGES IN THE WORK**
- SECTION 20. PAYMENT FOR WORK**

- SECTION 21. LIQUIDATED DAMAGES**
- SECTION 22. INSPECTION FOR SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE**
- SECTION 23. WARRANTY OF MATERIAL AND WORKMANSHIP**
- SECTION 24. GUARANTEE OF WORK**
- SECTION 25. STOP WORK ORDER**
- SECTION 26. TERMINATION OF CONTRACT FOR CAUSE**
- SECTION 27. TERMINATION FOR CONVENIENCE OF ROANOKE CHAPTER**
- SECTION 28. PRECONSTRUCTION CONFERENCE**
- SECTION 29. PROJECT SIGN(S)**
- SECTION 30. ASSIGNMENTS**
- SECTION 31. CONTRACTUAL DISPUTES**

ROANOKE CHAPTER, NRHS

GENERAL CONDITIONS

SECTION 1. DEFINITIONS

Whenever used in these General Conditions or in the Contract Documents, the following terms have the meanings indicated, which are applicable to both the singular and plural and the male and female gender thereof, and where applicable to any other legal entity such as a corporation, partnership, limited liability company, etc.

The section and paragraph headings are inserted for convenience only.

Architect, Engineer, Architect/Engineer or A/E: The term used to designate Spectrum Design, PC, the Architect and/or the Engineer who contracts with the Roanoke Chapter to provide the Architectural and Engineering services for the project. The Architect/Engineer is a separate Contractor and is referred to herein as the Architect/Engineer or abbreviated as A/E. The term includes any associates or consultants employed by the firm to assist in providing the A/E services.

Bidder: The person, firm, corporation, or other entity interested in submitting a bid for the Work to be performed.

Change Order: A document issued by the Architect on or after the effective date of the Contract which is agreed to by the Contractor and approved by the Roanoke Chapter, and which authorizes an addition, deletion, or revision in the Work, including any adjustment in the Contract Price and/or the Contract Time.

City Code: Refers to the Code of the Roanoke Chapter of Roanoke (1979), as amended.

Code of Virginia: Refers to the Code of Virginia (1950), as amended. (Sometimes referred to as Va. Code or Virginia Code.)

Contract Documents: These documents include, but are not limited to, the Project Manual, Invitation to Bid, the Instructions to Bidders, the Bid Form, the Contract, the Bonds or other Bid Security, the Escrow Agreement, the General Conditions, Supplementary General Conditions, Special Conditions, the Specifications, Addenda or Change Orders, the Plans and Drawings, any Supplementary Drawings, and any additional documents incorporated by reference in the above.

Contract: The written agreement between the parties concerning the performance of the Work and consisting of the Contract Documents.

Contractor: The person, firm, corporation, or other entity entering into a contractual agreement with the Roanoke Chapter to perform the Work.

Defect, Defective, or Deficient: An adjective or noun which when modifying or referring to the word Work refers to Work or any part thereof that is unsatisfactory, faulty, or does not conform to the Contract Documents, or does not meet the requirements of any inspections, standards, tests, or approvals referred to in the Contract Documents.

Documents(s): This term includes, but is not limited to: writings, drawings, items on which words, symbols, or marks are recorded; electronic data of any type; videotapes, recordings, photographs and negatives, digital or otherwise; and any other form of data, writing, or information compilation, however recorded or stored, and regardless of physical form or characteristics.

Field Order: A written order issued by the Architect which clarifies the requirements of the Contract by giving a more complete expression of the drawings or specifications or other documents without any change in the design, the Contract price, or the Contract time.

Final Acceptance: The Roanoke Chapter's acceptance of the project from the Contractor upon confirmation from the Architect and the Contractor that the project is apparently complete in accordance with the Contract requirements.

Notice: All written notices, demands, instructions, claims, approvals, and disapprovals required to obtain compliance with the Contract requirements. Any written notice by either party to the Contract shall be sufficiently given if delivered to or at the last known business address of the person, firm, or corporation constituting the party to the Contract, or to his, her, their, or its authorized agent, representative, or officer.

Notice to Proceed: A written notice given by the Roanoke Chapter at the Roanoke Chapter's discretion to the Contractor fixing the date on which the Contract time will commence for the Contractor to begin the prosecution of the Work in accordance with the requirements of the Contract Documents.

Project Inspector: One or more individuals employed by the Roanoke Chapter to inspect the Work and/or to act as Resident Inspector to the extent required by the The Roanoke Chapter shall notify the Contractor of the appointment of such Project Inspector(s).

Roanoke Chapter or Owner: The Roanoke Chapter, NRHS, or its authorized representative.

Provide: Shall mean to furnish and install ready for its intended use.

Subcontractor: A person, firm, partnership, corporation, or other entity having a direct contract with the Contractor or with any other Subcontractor for the performance of the Work. It includes one who provides on-site labor, but does not include one who only furnishes or supplies material for the project.

Submittals: All drawings, diagrams, illustrations, brochures, schedules, samples, electronic data and other data required by the Contract Documents which are specifically prepared by or for the Contractor, Subcontractor, or Supplier, and submitted by the Contractor to illustrate the material, equipment, or layouts, or some other portion of the Work.

Substantial Completion: The date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, so the Roanoke Chapter can occupy or utilize the Work or designated portion thereof for the purposes for which it is intended.

Supplier: A manufacturer, fabricator, distributor, materialman, or vendor who provides only material or supplies for the project, but does not provide on-site labor.

Work or Project: The entire completed construction or the various separately identifiable parts thereof as required by the Contract Documents. Work is the result of performing services, furnishing labor, and furnishing and incorporating material and equipment into the construction.

SECTION 2. INDEMNITY PROVISION

- 2.1 Indemnity:** Contractor shall indemnify and hold harmless Roanoke Chapter and City of Roanoke and its officers, agents, and employees against any and all liability, losses, damages, claims, causes of action, suits of any nature, costs, and expenses, including reasonable attorney's fees, resulting from or arising out of Contractor's or its employees, agents, or subcontractors actions, activities, or omissions, negligent or otherwise, on or near Roanoke Chapter's property or easement or arising in any way out of or resulting from any of the work to be provided under this Contract, and this includes, without limitation, any fines or penalties, violations of federal, state, or local laws or regulations, personal injury, wrongful death, or property damage claims or suits, breach of contract claims, indemnity claims, and any other damages, losses, and/or claims of any type.
- 2.2 Hazardous Material:** While on Roanoke Chapter's property or easement and in its performance of this Contract, Contractor shall not transport, dispose of or release any hazardous substance, material, or waste, except as necessary in performance of its Work under this Contract and in any event Contractor shall comply with all federal, state, and local laws, rules, regulations, and ordinances controlling air, water, noise, solid wastes, and other pollution, and relating to the storage, transport, release, or disposal of hazardous material, substances or waste. Regardless of Roanoke Chapter's acquiescence, Contractor shall indemnify and hold Roanoke Chapter, its officers, agents, and employees harmless from all costs, claims, damages, causes of action, liabilities, fines or penalties, including reasonable attorney's fees, resulting from Contractor's violation of this paragraph and agrees to reimburse Roanoke Chapter for all costs and expenses incurred by Roanoke Chapter in eliminating or remedying such violations. Contractor also agrees to reimburse Roanoke Chapter and hold Roanoke Chapter, its officers, agents, and employees harmless from any and all costs, expenses, attorney's fees and all penalties or civil judgments obtained against the Roanoke Chapter as a result of Contractor's use or release of any hazardous substance or waste onto the ground, or into the water or air from or upon Roanoke Chapter's premises. (See also Section 13.2 of these General Conditions.)
- 2.3 Patents:** The Contractor shall protect, indemnify, and hold harmless the Roanoke Chapter and City of Roanoke from any and all demands for fees, claims, suits, actions, causes of action, or judgments based on the alleged infringement or violation of any patent, invention, article, trademark, arrangement, or other apparatus that may be used in the performance of the Contract or the Work.

SECTION 3. LAWS, REGULATIONS, PERMITS, AND IMMIGRATION LAW

- 3.1 Regulations:** The Contractor shall fully comply with all local, state, and federal ordinances, laws, and regulations, including without limitation all applicable building and fire code sections of the Occupational Safety and Health Act (OSHA), and the Virginia Uniform Statewide Building Code, and obtain all required licenses and permits, including business license, building permits, and pay all charges and expenses connected therewith. Contractor further agrees that Contractor does not, and shall not during the performance of this Contract, knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.
- 3.2 Permits:** The Contractor shall, at its sole cost, obtain all required permits from the appropriate authorities, including the City of Roanoke. This includes, but is not limited to, all permits for any excavations in any public right-of-way. No delay or extension of

time or any claim for additional compensation of any type shall be granted for failure to obtain any required permits.

- 3.3 **Litter:** In accordance with the Virginia Anti-Litter Law, receptacles sufficient to contain workmen's litter and construction wastes capable of being spread by wind or water shall be located on the construction site. The number and size of receptacles required shall be determined by the Contractor.
- 3.4 **Asbestos License:** The Contractor, if not licensed as an asbestos abatement contractor or a Roofing, Flooring, and Siding (RFS) contractor in accordance with Section 54.1-514, of the Code of Virginia, shall have all asbestos related work performed by subcontractors who are duly licensed as asbestos contractors or RFS contractors as appropriate for the work required.

SECTION 4. CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

Neither the Contractor nor any subcontractor shall commence work under this Contract until the Contractor has obtained and provided proof of the required insurance under this Section to the Roanoke Chapter. The Contractor confirms that all subcontractors have provided the Contractor with proof of insurance. Contractor further warrants that proof of coverage as provided to the Roanoke Chapter responds on a primary basis in the event of an uninsured or underinsured subcontractor. All such insurance shall be primary and non-contributory to any insurance or self-insurance the Roanoke Chapter may have in force.

- 4.1 **For All Contracts**, the following minimum insurance requirements apply:

- a. **Workers' Compensation and Employers' Liability:**

The Contractor shall obtain and maintain the following limits:

Workers' Compensation: Statutory

Employers' Liability: \$100,000 bodily injury by accident each occurrence
\$500,000 bodily injury by disease (policy limit)
\$100,000 bodily injury by disease each employee

- b. **Commercial General Liability:**

Coverage is to be written on an "occurrence" basis and such coverage shall include broad form extension endorsements for both liability and property damage.

Completed Operations coverage will be required to be maintained for the life of the Contract.

For Limits of Liability see Sections 4.2 and 4.3 of these General Conditions.

c. Automobile Liability:

Limits for vehicles owned, non-owned, hired or borrowed shall not be less than:

- \$1,000,000 Bodily Injury and Property Damage combined single limit per occurrence.

d. Additional Insurance Requirements:

Additional specific insurance coverage minimum requirements to be provided by Contractor may include the following as detailed in the Supplementary General Conditions:

- 1) Builders Risk: At the discretion of the Roanoke Chapter, the Contractor, at its cost, shall obtain and maintain in the names of the Roanoke Chapter and the Contractor "all-risk" builders risk insurance (if approved by the Roanoke Chapter) upon the entire structure or structures on which the Work of this Contract is to be done and upon all material in or adjacent thereto or those that are "off-site" but which are intended for use thereon, to one hundred percent (100%) of the completed value thereof.
- 2) Property Coverage: Installation Floater (and Rigger's Form, if applicable) will be required for the installation of contents or equipment, coverage will begin with supplier and continue until equipment/contents has been fully installed. Floater will be valued for the replacement cost value of equipment/contents including all costs. The Contractor shall provide coverage for portions of the work stored off-site after written approval of the Roanoke Chapter at the value established in the approval and for portions of the work in transit.
- 3) Special Hazards: In the event special hazards are evident in the work contemplated, or if required by the Contract Documents, the Contractor shall obtain and maintain during the life of the Contract a rider to the policy or policies required, in an amount not less than that stipulated under the above Paragraphs. Should any unexpected special hazards be encountered during the performance of this Contract, the Contractor shall, prior to performing any work involving the special hazard, immediately obtain this insurance as instructed by the Roanoke Chapter. In the event the special hazard requiring the additional coverage was not a part of the original bid, the expense of such insurance shall be reimbursed to the Contractor by the Roanoke Chapter, otherwise the Contractor shall assume full responsibility for the purchase with no charge back to the Roanoke Chapter.
- 4) Railroad Liability Insurance: Including the costs for flagging, railroad engineering services, and related charges.
- 5) Deductible: Deductible/self-insured retention amounts shall be reduced or eliminated upon written request from Roanoke Chapter. The insurer's cost of defense (and appeal), including attorney's fees, shall not be included within the coverages provided but shall remain the insurer's responsibility.

- 6) **Term:** Insurance shall remain in effect until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective work.
- 7) **Limit of Liability:** Nothing contained in these insurance requirements is to be construed as limiting the liability of Contractor or Contractor's insurance carriers. Roanoke Chapter does not in any way represent that the coverages or the limits of insurance specified is sufficient or adequate to protect Contractor's interests or liabilities, but are merely minimums. The obligation of the Contractor to purchase insurance herein shall not in any way limit the obligation of the Contractor in any event and/or in the event that the Roanoke Chapter should suffer an injury or loss in excess of the amount recoverable through insurance.

4.2 Minimum Insurance Requirements: The following minimum insurance requirements apply in addition to the above requirements:

a. **Limits of Liability:** For the Commercial General Liability policy:

- \$2,000,000 general aggregate
- \$1,000,000 products/completed operations aggregate
- \$1,000,000 personal and advertising injury
- \$1,000,000 each occurrence

Coverage is to be written on an "occurrence" and "per project" basis and such coverage shall include:

b. **Umbrella Liability Insurance:**

This coverage shall be written for minimum limit of:

- \$5,000,000 each occurrence for Personal and Bodily Injury and Property Damage

This Policy shall apply in excess and follow form of employer's liability, commercial general liability, and auto liability.

4.3 Special Hazards Insurance: The following minimum insurance limits apply:

a. **Railroad Liability Insurance:**

- \$5,000,000 Coverage amount

4.4 Proof of Insurance Coverage: The policies of insurance required by Sections 4.1, 4.2, or 4.3 shall be purchased from a reputable insurer licensed to do business in Virginia and maintained for the life of the Contract by the Contractor. Other insurance requirements include the following:

- a. The Contractor shall furnish the Roanoke Chapter with the required certificates of insurance showing the insurer, type of insurance, policy number, policy term, deductible, and the amount insured for property coverages and the limits for liability coverages.
- b. The Contractor shall notify the Roanoke Chapter in writing within five (5) consecutive calendar days if any of the insurance coverages or policies are

- cancelled or materially altered and Contractor shall immediately replace such policies and provide documentation of such to the Roanoke Chapter.
- c. The required certificates of insurance shall name the Roanoke Chapter, NRHS, its officers, agents, volunteers, and employees as additional insureds except with regard to the workers' compensation and employers' liability coverages. All coverages shall contain a waiver of subrogation in favor of the Roanoke Chapter. Additional insured and waiver endorsements shall be received by Roanoke Risk Management from the insurer within thirty (30) calendar days of the beginning of this contract. Certificate must also state that the aggregate limit applies on a per project basis.
 - d. Insurance coverage shall be in a form and with an insurance company approved by the Roanoke Chapter which approval shall not be unreasonably withheld. Any insurance company providing coverage under this Contract shall be authorized to do business in the Commonwealth of Virginia.

SECTION 5. EMPLOYMENT AND CONDUCT OF PERSONNEL

5.1 Not Used

5.2 Employee Qualifications: Only skilled and reliable workers shall be employed for the Work. Should any person employed on the Work by the Contractor appear to the Architect to be incompetent, unable to perform the Work, or disorderly, such person shall be removed from the Work immediately upon proper notice to the Contractor from the Architect and such person shall not again be used for this Contract.

5.3 Superintendence: The Contractor shall have a competent foreman or superintendent, satisfactory to the Architect, on the jobsite at all times during the progress of the Work. The Contractor shall notify the Roanoke Chapter, in writing, of any proposed change in the foreman or superintendent including the reason therefore prior to making such change.

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

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

The Contractor shall post a copy of the policy in a conspicuous place at the jobsite and assure that all Contractor, subcontractor, and supplier personnel entering the jobsite are informed of the policy.

SECTION 6. EMPLOYMENT DISCRIMINATION BY CONTRACTOR PROHIBITED

Every Contract of over \$10,000 to which the Roanoke Chapter is a party shall contain the provisions in Sections 6.1 and 6.2 herein:

6.1 Nondiscrimination: During the performance of this Contract, the Contractor agrees as follows:

- a. The Contractor will not discriminate against any Subcontractor, employee, or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by State law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
- b. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal employment opportunity employer.
- c. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

6.2 Nondiscrimination by Subcontractor or Vendor: The Contractor will include the provisions of the foregoing Subsections 6.1 (a), (b), and (c) in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

SECTION 7. SUBCONTRACTORS

7.1 Licensure: The Contractor shall comply with Title 54.1, Chapter 11, of the Code of Virginia, with respect to licensure of itself and all subcontractors employed to work on the project. The Contractor represents that it has verified that all subcontractors hold all required state and local licenses, including State Contractor's license and City business license. The Contractor shall verify that any additional subcontractors employed to work on the project, subsequent to the initial verification, hold all required state and local licenses, including State Contractor's license and City business license. The Contractor is required to submit the Contractor's Certification as to Licensure of Subcontractors Form to the Architect. This constitutes a material part of the Contractor's Contract with the Roanoke Chapter.

7.2 Change of Subcontractors: Subcontractors shall not be changed without the written approval of the Architect.

7.3 Responsibility for Subcontractors: The Contractor shall not employ for the project any subcontractor that the Roanoke Chapter may, within a reasonable time, object to as unsuitable. The Contractor further agrees that it is as fully responsible to the Roanoke Chapter for the acts and omissions of its subcontractors, suppliers, and invitees on the jobsite and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons directly employed by it.

SECTION 8. CONDITIONS AT SITE

8.1 Existing Conditions: The Contractor shall have visited the site prior to bidding and is responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the site, and the character and extent of existing improvements and work within or adjacent to the site. Claims as a result of failure to have done so will not be considered by the Roanoke Chapter and will be the sole responsibility of the Contractor.

8.2 Hidden Conditions: If, in the performance of the Contract, hidden physical conditions of a building being modified are exposed revealing unusual or materially different conditions than those ordinarily encountered or inherent in work of this nature, or if subsurface or latent conditions at the site are found which are materially different from those frequently present in the locality, from those indicated in the Contract Documents, or from those inherent in work of the character required by the Contract, the Contractor must report such conditions to the Architect before the conditions are disturbed. Upon such notice, or upon his own observation of such conditions, the Architect will make such changes in the Contract Documents as he finds necessary to conform to the different conditions. Any change in the cost of the Work or the time needed for completion must be requested pursuant to Section 19 of these General Conditions.

8.3 Suspected Hazardous Material: If the Contractor, during the course of the project, observes the existence of any material which it suspects or knows to be hazardous to human health or the environment, the Contractor shall promptly notify the Architect. The Architect will provide the Contractor with instructions regarding the situation. The Contractor shall not perform any work involving the material or any work causing the material to be less accessible prior to receipt of special instructions from the Architect.

SECTION 9. SURVEYS AND LAYOUT

9.1 Surveying Services: All necessary drawings showing the location of property lines, buildings, and other appropriate information shall be furnished to the Contractor through the drawings and specifications. The Contractor shall provide competent surveying and engineering services to verify the given information and to execute the Work in accordance with the Contract requirements and shall be responsible for the accuracy of Contractor's surveying and engineering services. The Contractor shall immediately notify the Architect of any discrepancies and confirm such notice in writing within five (5) calendar days.

9.2 Survey Control: Such general reference points and bench marks on the building site as will enable the Contractor to proceed with the Work will be established in the drawings and specifications. If the Contractor finds that any previously established reference points have been lost or destroyed, Contractor shall promptly notify the Architect.

9.3 Damage to Survey Control: The Contractor shall protect and preserve the established bench marks and monuments and shall make no changes in locations without written notice to and approval from the Architect. Any of these which may be lost or destroyed

or which require shifting because of necessary changes in grades or locations shall, subject to prior approval from the Architect, be replaced and accurately located by the Contractor.

SECTION 10. DRAWINGS AND SPECIFICATIONS

- 10.1 Drawings and Specifications:** The general character and scope of the Work are illustrated by the drawings and specifications. Where on any of the drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the Work. If the Contractor deems additional detail or information to be needed, Contractor may request the same in writing from the Architect. The Contractor shall carry out the Work in accordance with the drawings and specifications and any additional detail drawings and instructions as issued by the Architect. However, Contractor shall immediately notify the Architect of any discrepancies in such drawings and/or specifications and confirm such notice in writing within five (5) calendar days.
- 10.2 Discrepancies in Drawings:** In case of difference between small and large scale drawings, the large scale drawings shall govern, unless otherwise directed in writing by the Architect.
- 10.3 "Similar":** Where the word "similar" appears on the drawings, it shall be interpreted in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection with other parts of the Work.
- 10.4 Division of Specifications:** The specifications are divided into several parts for convenience only, since the entire specifications must be considered as a whole. The divisions of the specifications are not intended to control the Contractor in dividing the work among subcontractors or to limit the work performed by any trade. The Contractor shall be responsible for the coordination of the trades, subcontractors, and vendors engaged upon this Work.
- 10.5 Dimension Accuracy:** Measurements or dimensions shown on the drawings for site features, utilities, and structures shall be verified at the site by the Contractor. The location of underground utilities indicated on the plans are diagrammatic and were plotted from available records and field survey information and shall be considered approximate only, and the Roanoke Chapter makes no representations with regard to their accuracy. The Contractor shall not scale measurements or dimensions from the drawings. Where there are discrepancies, the Architect shall be consulted. Where new work is to connect to, match with, or be provided for existing work, the Contractor shall verify the actual existing conditions and related dimensions prior to ordering or fabrication, so that such new work will properly fit with existing work.
- 10.6 As-Built Drawings:** The Contractor shall maintain at the site for the Roanoke Chapter one copy of all drawings, specifications, addenda, approved shop or setting drawings, change orders, field deviations, and other documents or modifications (referred to herein as "As-Built Drawings") in good order and marked to record all changes as they occur during construction. These shall be available to the Architect, the Project Inspector, and the Roanoke Chapter's testing personnel. These "As-Built Drawings" shall be neatly and clearly marked in color during construction to record all variations from the drawings made during construction. The representation of such variations shall include such supplementary notes, symbols, legends, documents, and details as may be necessary to clearly show the as-built construction.
- 10.7 Record Drawings:** Upon completion of the Work and prior to Final Acceptance, the Contractor shall deliver to the Architect, for preparation of the Record Drawings, one complete set of "As-Built Drawings" and documents referred to in Section 10.6.

SECTION 11. SCHEDULE OF THE WORK

- 11.1 Scheduling:** The Contractor is responsible for the sequencing, scheduling, and coordinating of the Work, for monitoring the progress of the Work, and for taking appropriate action to keep the Work on schedule. The Contractor is responsible for coordinating Contractor's work on the Project with any other work being carried on by the Roanoke Chapter or by other Roanoke Chapter consultants or contractors at the site or for the Project. The Contractor shall prepare and submit to the Architect a schedule for accomplishing the Work based upon the completion time stated in the Contract and submit such to the Architect at the pre-construction conference. No progress payments will be made to the Contractor until after Contractor has submitted a schedule which is acceptable to the Architect. All schedules under Section 11 shall be in both paper and electronic form unless otherwise directed by the Architect.
- 11.2 Progress:** The Contractor shall review the progress of the Work not less than each month, but as often as necessary to properly manage the project and stay on schedule. The Contractor shall collect and preserve information on Change Orders, including extensions of time. The Contractor shall evaluate this information and update the schedule monthly to finish within the contractually allowed time. The Contractor shall submit the updated schedule with each progress payment request. The scheduled completion date shall be within the period of time allowed by the Contract for completion of construction, except as amended by any Change Orders.
- 11.3 Delay and Recovery Schedule:** Should there be any delay, the Architect may require the Contractor to prepare, at no extra cost to the Roanoke Chapter, a plan of action and a recovery schedule for completing the Work by the contractual completion date. The plan of action and recovery schedule shall explain and display how the Contractor intends to regain compliance with the original schedule. The plan of action and recovery schedule, when required, shall be submitted and approved by the Architect prior to Contractor's submission of the next monthly construction estimate. The Roanoke Chapter may withhold progress payments until such schedule is submitted and approved.

SECTION 12. CONSTRUCTION SUPERVISION

The Contractor shall be solely responsible to supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract. The Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor is solely responsible to the Roanoke Chapter that the finished Work complies with the Contract Documents. The Contractor shall be solely responsible for health and safety precautions and programs for workers and others in connection with the Work. No inspection by, knowledge on the part of, or acquiescence by the Roanoke Chapter, or any other entity whatever shall relieve the Contractor from its sole responsibility for compliance with the requirements of the Contract or responsibility for health and safety programs and precautions.

SECTION 13. STANDARDS FOR MATERIAL INSTALLATION AND WORKMANSHIP

- 13.1 Material and Equipment:** Unless otherwise specifically provided in this Contract, all equipment, material, and accessories incorporated in the Work are to be new and in first class condition. The Contractor shall furnish to the Architect for approval the name of

Project: Virginian Station – Phase II

General Conditions
Rev. 2/21/2014

the manufacturer, the model number, and other identifying data and information respecting the performance, capacity, nature, and rating of the machinery and mechanical and other equipment which the Contractor contemplates incorporating in the Work. Machinery, equipment, material, and articles installed or used without required approval may be subject to subsequent rejection by the Roanoke Chapter.

- 13.2 Hazardous Substances:** Unless specifically approved by the Roanoke Chapter or required by the specifications, the Contractor shall not incorporate any material into the Work containing asbestos or any material known by the Contractor to contain a substance known to be hazardous to health when the building and/or site is occupied by the Roanoke Chapter. If the Contractor becomes aware that a material required by the specifications contain asbestos or other hazardous substances, it shall notify the Roanoke Chapter and the Architect immediately and shall take no further steps to acquire or install any such material without first obtaining Roanoke Chapter approval. (See also Sections 2.2 and 8.3 of these General Conditions.)
- 13.3 Workmanship:** The workmanship shall be of the highest quality found in the building industry in every respect. All items of Work shall be done by workmen skilled in the particular task to which they are assigned. In the acceptance or rejection of work, no allowance will be made for lack of skill on the part of workmen. Poor or inferior workmanship (as determined by the Architect, the Roanoke Chapter, or other inspecting authorities) shall be removed and replaced to conform to the highest quality standards of the trades concerned, or otherwise corrected to the satisfaction of the Architect, the Roanoke Chapter, or other inspecting authority all at the Contractor's sole expense.
- 13.4 Instructions for Installation:** Under the various sections of the specifications, where specified items are supplied with the manufacturer's printed instructions, recommendations, or directions for installation, or where such instructions, recommendations, or directions are available, installation of the specified items shall be in strict accordance with the manufacturer's printed instructions unless those instructions contradict the drawings or specifications, in which case the Architect will be notified by Contractor for an interpretation and decision.
- 13.5 Installation Procedures Without Instructions:** Where neither the manufacturer's printed instructions are available for installation of specific items, nor are specific code or standards given by reference to govern the installation of specific items; and where there is doubt concerning the installation procedures to be followed or the quality of workmanship to be maintained in the installation of specific items, the Contractor shall consult the Architect for approval of the installation procedures Contractor proposes to follow or the specific standards governing the quality of workmanship Contractor proposes to maintain during the installation of the items in question.
- 13.6 Codes and Standards:** Under the various sections of the specifications, where reference is made to specific codes or standards governing the installation of specified items, installation shall in all cases be in strict accordance with the referenced codes and standards. Where no reference is made to specific codes or standards, installation shall conform to the generally recognized applicable standards for first-class installation of the specific item to be installed. Contractors are expected to be proficient and skilled in their respective trades and knowledgeable of the National Fire Protection Association (NFPA), the current edition of the Virginia Uniform Statewide Building Code (USBC) and its referenced technical codes and standards, Occupational Safety and Health Act (OSHA) and other codes and standards applicable to installations and associated work by its trade and/or that are applicable to the Work.

SECTION 14. SUBMITTALS

- 14.1 General:** The Contractor shall submit for the approval of the Architect all submittals required by the specifications or requested by the Architect. All such submissions shall be made with such promptness as to cause no delay in this or any other part of the project, and to allow reasonable time for checking, correcting, resubmitting, and recorrecting. No part of the Work dealt with by a submittal shall be fabricated by the Contractor, save at Contractor's own risk, until such approval has been given. The Contractor shall maintain one (1) set of approved submittals at the jobsite at all times.
- 14.2 Format:** Submittals shall be made in such number of copies that two (2) approved copies may be retained by the Architect. Each submission shall be accompanied by a letter of transmittal listing the contents of the submission and identifying each item by reference to specification section or drawings. All submittals shall be clearly labeled with the name of the project and other necessary information. Catalog plates and other similar material that cannot be so labeled conveniently, shall be bound in suitable covers bearing the identifying data.
- 14.3 Supporting Material:** Submittals shall be accompanied by all required certifications and other such supporting material and documents, and shall be submitted in such sequence or in such groups that all related items may be checked together. When submittals cannot be checked because the submission is not complete, or because submittals on related items have not been received, then such submittals will be returned without action or will be held, not checked, until the material which was lacking is received.
- 14.4 Coordination:** Submittals 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 it has checked and approved them as complying with the information given in the Contract Documents. Submittals made without such certification and coordination will be returned to the Contractor without action, and will not be considered a formal submission. The Contractor shall be responsible for checking all dimensions and coordinating all material and trades to ensure that the material proposed will fit in the space available and be compatible with other material provided.
- 14.5 Variations:** If the submittals show variations from the Contract Documents because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in Contractor's letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise the Contractor will not be relieved of the responsibility for executing the Work in accordance with the Contract Documents even though such submittals have been approved.
- 14.6 "Or Equal":** The drawings and/or specifications may indicate that the Architect designed or detailed a portion of the plans around a particular product (most commonly a piece of equipment). Should a different product be proposed by the Contractor and accepted, all modifications, rerouting, relocations, and variations required for proper installation and coordination to comply with the design concept and requirements of the Contract Documents shall be the sole responsibility of the Contractor and shall be made at no extra cost to the Roanoke Chapter. This naming of a particular product, around which the plans were designed or detailed, is not intended to preclude the use of other products or favor the product named when a "brand name or equal" specification has been used. (See also Section 10 of Instructions to Bidders.) Rather it is only intended

to acknowledge the reality that in many instances the Architect must design around the dimensions and characteristics of a particular product.

- 14.7 Review by Architect:** The Architect will review and respond to the submittals within fourteen (14) calendar days. Checking and/or approval of submittals will be for general conformance with the design concept of the project and compliance with the information given in the Contract Documents, and will not include verification of quantities, detailed dimensions, nor adjustments of dimensions to actual field conditions. Approval shall not be construed as permitting any departure from Contract requirements, authorizing any increase in price or time for completion or relieving the Contractor of the responsibility for any error in details, dimensions, or otherwise that may exist.

- 14.8** The Work shall be in accordance with approved submittals.

SECTION 15. INSPECTION AND INDEPENDENT TESTING

- 15.1 Inspection and Testing:** All material and workmanship shall be subject to inspection, examination, and testing by the Architect at any and all times during manufacture and/or construction. The Architect shall have authority to reject defective material and workmanship and require its correction. Rejected workmanship shall be satisfactorily corrected and rejected material shall be satisfactorily replaced with proper material without charge therefore, and the Contractor shall promptly segregate and remove the rejected material from the premises. If the Contractor fails to proceed at once with replacement of rejected material and/or the correction of defective workmanship, the Roanoke Chapter may, by contract or otherwise, replace such material and/or correct such workmanship and charge the cost to the Contractor, and/or may terminate the right of the Contractor to proceed as provided in Sections 26 or 27 of these General Conditions, the Contractor and surety being liable for any damage to the same extent as provided for in those Sections.

15.2 Payment for Inspection, Testing, and Certification:

- a. Jobsite inspections, tests conducted on site, or tests of material gathered on site which the Contract requires to be performed by independent testing entities shall be contracted and paid for by the Roanoke Chapter. The Contractor shall promptly furnish, without additional charge, all reasonable facilities, labor, and material necessary for making such tests. Except as provided in Section 15.3 below, whenever such examination and testing finds defective material, equipment, or workmanship, the Contractor shall reimburse the Roanoke Chapter for the cost of reexamination and retesting.
- b. Although conducted by independent testing entities, the Roanoke Chapter will not contract and pay for tests or certifications of material, manufactured products or assemblies which the Contract, codes, standards, etc. require to be tested and/or certified for compliance with industry standards such as Underwriters Laboratories, Factory Mutual or ASTM. If there are any fees to be paid for such tests and certifications, they shall be paid by the Contractor.
- c. The Contractor shall also pay for all inspections, tests, and certifications which the Contract specifically requires it to perform or pay, together with any inspections and tests which it chooses to perform for its own quality control purposes.

- 15.3 Examination of Completed Work:** Should it be considered necessary or advisable by Roanoke Chapter or the Architect at any time before final acceptance of the entire Work to make an examination of any part of the Work already completed, by removing or tearing out portions of the Work, the Contractor shall on request promptly furnish all necessary facilities, labor, and material to expose the Work to be tested to the extent required. If such Work is found to be defective in any respect, due to the fault of the Contractor or its Subcontractors, Contractor shall pay for all the expenses of uncovering the Work, of examination and testing, and of satisfactory reconstruction. If, however, such Work is found to meet the requirements of the Contract, the actual cost of the Contractor's labor and material necessarily involved in uncovering the Work, the cost of examination and testing and Contractor's cost of material and labor necessary for replacement shall be paid to the Contractor and it shall, in addition, if completion of the Work has been delayed thereby, be granted a suitable extension of time.
- 15.4 Suspension of Work:** The Roanoke Chapter may suspend the Work when in its judgment the drawings and specifications are not being followed. Any such suspension shall be issued in writing and continued only until the matter in question is resolved to the satisfaction of the Roanoke Chapter. The cost of any such Work stoppage shall be borne by the Contractor unless it is later determined that no fault existed in the Contractor's Work.
- 15.5 Project Inspector:** Failure of the Project Inspector to note or require correction of improper or defective work does not relieve the Contractor from its responsibility to correct such improper or defective work. The Project Inspector has no authority to and shall not:
- a. Enter into the area of responsibility of the Contractor's superintendent;
 - b. Issue directions relative to any aspect of construction means, methods, techniques, sequences or procedures, or in regard to safety precautions and programs in connection with the Work;
 - c. Authorize or suggest that the Roanoke Chapter occupy the project, in whole or in part; or
 - d. Issue a certificate for payment.

SECTION 16. USE OF PREMISES AND REMOVAL OF DEBRIS

- 16.1 Jobsite Coordination:** The Contractor shall perform the Contract in such a manner as not to interrupt or interfere with the operation of any existing activity on the premises or with the work of any other contractor.
- 16.2 Storage of Material:** The Contractor shall store apparatus, material, supplies, and equipment in such orderly fashion at the site of the Work as will not unduly interfere with the progress of its Work or the work of any other contractor.
- 16.3 Jobsite Appearance:** The Contractor expressly undertakes, either directly or through its Subcontractor(s), to clean up frequently all refuse, rubbish, scrap material, and debris caused by his operations, to the end that at all times the jobsite shall present a neat, orderly, and workmanlike appearance. No such refuse, rubbish, scrap material, and

debris shall be left within the completed Work nor buried on the building site, but shall be properly protected and removed from the site and properly disposed of in a licensed landfill or otherwise as required by law.

- 16.4 **Final Cleaning:** The Contractor expressly undertakes, either directly or through its Subcontractor(s), before final payment, to remove all surplus material, false work, temporary structures, including foundations thereof, and debris of every nature resulting from its operations and to put the site in a neat, orderly condition, to thoroughly clean and leave reasonably dust free all finished surfaces including all equipment, piping, etc., on the interior of all buildings included in the Contract; and to thoroughly clean all glass installed under the Contract including the removal of all paint and mortar splatter and other defacements. If a Contractor fails to clean up at the completion of the Work, the Roanoke Chapter may do so and charge for costs thereof to the Contractor in accordance with these General Conditions.
- 16.5 **Erosion Control:** During and at completion of the Work, the Contractor shall prevent site soil erosion, the runoff of silt and/or debris carried by water from the site, and the blowing of dust or debris off the site in accordance with the applicable requirements and standards of the Virginia Erosion and Sediment Control Handbook, latest edition, and of the Contract Documents.

SECTION 17. PROTECTING PERSONS AND PROPERTY

- 17.1 **Protection on Site:** The Contractor expressly undertakes, both directly and through its Subcontractor(s), to take every reasonable precaution at all times for the protection of all persons and property which may come on the jobsite or be affected by the Contractor's operation in connection with the Work.
- 17.2 **Safety and Health Precautions:** The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety and health precautions and programs in connection with the Work, including but not limited to provision of appropriate sanitation facilities, if applicable.
- 17.3 **Protecting the Public:** The Contractor shall in all cases protect the public and the Work, during its execution, by posting and maintaining, at its expense, appropriate signs, barricades, barriers, lights, flagmen, and other safety devices in accordance with the current edition of the "Virginia Work Area Protection Manual".
- 17.4 **Protecting the Work and Adjacent Property:** The Contractor shall continuously maintain adequate protection of all the Work from damage and shall protect the Roanoke Chapter's property from injury or loss arising in connection with this Contract. The Contractor shall adequately protect adjacent property to prevent any damage to it or loss of use and enjoyment by its owners. The Contractor shall provide and maintain all passageways, guard fences, lights, and other facilities for protection required by public authority, local conditions, any of the Contract Documents or erected for the fulfillment of its obligations for the protection of persons and property.
- 17.5 **Emergencies:** In an emergency affecting the safety or life of persons or of the Work, or of the adjoining property, the Contractor, without special instruction or authorization from the Architect, shall act, at Contractor's discretion, to prevent such threatened loss or injury. Also, should Contractor, to prevent threatened loss or injury, be instructed or authorized to act by the Architect, Contractor shall so act immediately, without appeal.

SECTION 18. DAMAGES TO THE WORK AREA

- 18.1 Damage to the Work:** The Contractor shall have charge of and be solely responsible for the entire Work and be liable for all damages to the Work including, but not limited to any of the damages hereafter mentioned, and to any property in the vicinity of the Work, until its completion and acceptance by the Architect.
- a. Where the work involves alterations, renovations, or modifications to any existing building, the Contractor shall familiarize itself with the structural condition of such building before proceeding with any work. It shall be the Contractor's responsibility to take all necessary safeguards to protect and maintain all parts of the building in a safe condition at all times during the process of construction and to protect from damage those portions of the building that are to remain.
 - b. Under no condition shall any load be placed on any part of a building, whether new or existing, in excess of the load the structure will safely support, and no structural member(s) shall be cut or altered without the written consent of the Architect.
 - c. The Contractor shall conduct all operations in such a manner as to avoid damage to existing work and surfaces within any existing building that are to remain. Any and all damaged work and surfaces shall be repaired, replaced, or restored to their original condition at the time when this work was started, and the expense of such work shall be borne by the Contractor.
- 18.2 Damage to Utilities:** The respective Utility Company shall be given a minimum of forty-eight (48) hours notice prior to any adjustment of utilities, and the Contractor shall comply with the provisions of the Virginia Underground Utilities Damage Prevention Act, Section 56-265.14 et seq., of the Code of Virginia. Damages that may occur to the utilities during the Work shall be the sole responsibility of the Contractor.
- 18.3 Relocation of Utilities:** Should any utilities require adjustment during the Work, it shall be the Contractor's responsibility to have such utilities relocated as a part of the Work and to contact and cooperate with the respective Utility Company in performance of such operations.
- 18.4 Damage to Other Work and Existing Structures:** The Contractor shall take into account all other work which shall be done by other parties on the jobsite, either now known or which may become necessary during the progress of the Work, and shall be responsible for any damage done to the other work. Damage to concrete curbs, gutters, sidewalks, or any existing facility that may occur during the construction shall be repaired or replaced by the Contractor, at its sole expense, as directed by and to the satisfaction of the Architect.
- 18.5 Weather Damage:** Damage with respect to the Work caused by the weather shall be the responsibility of the Contractor.
- 18.6 Blasting:** Any damage that may occur due to blasting shall be the sole responsibility of the Contractor.

SECTION 19. CHANGES IN THE WORK

- 19.1 Changes in Drawings and Specifications:** The Roanoke Chapter reserves the right to make such changes in the drawings and specifications and in the character of the Work as may be necessary or desirable to ensure completion in the most satisfactory manner, provided such changes do not materially alter the original plans and specifications or change the general nature of the Work as a whole. Such changes shall not be considered as waiving or invalidating any condition or provision of the Contract and Bonds. Such changes shall be issued by the Architect to Contractor.
- 19.2 Changes in Quantities:** The Roanoke Chapter reserves the right to make changes in the quantities of the Work, as may be considered necessary or desirable, and such changes shall not be considered as waiving or invalidating any conditions or provisions of the Contract or Bonds. The Contractor shall perform the Work as altered, whether increased or decreased, and no allowances shall be made for anticipated profits. Payment to the Contractor for the changes in the quantities of work shall be made only for the actual quantities of work performed and material furnished at the unit prices set forth in the Contract, except as provided below.
- a. When the quantity of work to be done or of material to be furnished under any item of the Contract is more than 125 percent of the quantity stated in the Contract, then either party to the Contract, upon demand, shall be entitled to negotiate for revised consideration on the portion of work above 125 percent of the quantity stated in the Contract.
 - b. When the quantity of work to be done or of material to be furnished under any item of the Contract is less than 75 percent of the quantity stated in the Contract, then either party to the Contract, upon demand, shall be entitled to negotiate for revised consideration on the Work performed.
 - c. Any consideration after that as set forth above shall be paid for as is hereinafter provided under Section 19.7. The foregoing notwithstanding, the quantity of work to be done or of material to be furnished under any item of the Contract, or the total original Contract shall not be increased more than 25 percent or reduced by more than 25 percent without the written consent of the Contractor and Roanoke Chapter.
- 19.3 Changes in the Work:** No change with respect to the Work, except in an emergency situation threatening life or property, shall be made by the Contractor without the prior written approval of the Roanoke Chapter. The Contractor shall deliver any request for a change in the Work, Contract price, and/or completion time in writing to the Architect within ten (10) calendar days of the occurrence requiring the change. The Contractor shall be required to certify the cause of the change order and, if appropriate, length of time involved. Payment for such changes approved by the Architect shall be as set forth in Section 19.7. This written request is a condition precedent to the consideration of any such request by the Roanoke Chapter.
- 19.4 Delays:**
- a. In the event a delay is caused by the Roanoke Chapter, the Architect, any other separate contractor employed by the Roanoke Chapter, or any party for whom the Contractor deems the Roanoke Chapter responsible, or the agents and employees of any of them, the Contractor shall inform the Roanoke Chapter and the Architect immediately at the time of the occurrence by the fastest means available and shall give written notice within a reasonable time, not to exceed ten (10) calendar days. The Contractor's notice to the Architect shall specify the

nature of the delay claimed by the Contractor, the cause of the delay, and the impact of the delay on the Contractor's work schedule to the fullest extent possible. The Roanoke Chapter will within a reasonable time, not to exceed ten (10) calendar days, respond to the Contractor's notice with a resolution, remedy, or direction to alleviate the delay or with a notice rejecting the claim for delay alleged to be caused by the Roanoke Chapter or parties for whom the Roanoke Chapter is responsible. If the delay is not then resolved, the Contractor may then submit a request for change order in accordance with Sections 19.3 and 19.5. In the event of other delays, the Contractor shall give the Roanoke Chapter and Architect written notice within ten (10) calendar days of the occurrence causing the delay.

- b. No extension of time or compensation shall be allowed for a delay if the Contractor failed to give notice in the manner and within the time prescribed in Subsection 19.4 (a). Furthermore, no extension of time shall be given or additional compensation allowed for any delay unless a claim therefore is made in writing to the Roanoke Chapter, with a copy to the Architect, within ten (10) calendar days of the occurrence causing the delay. The claim shall state the cause of the delay, the number of days of extension requested, and any compensation requested by the Contractor. The Contractor shall report the termination of the delay to the Roanoke Chapter and Architect not less than ten (10) calendar days after such termination. Failure to give notice of either the inception or the termination of the cause of delay or failure to present a claim for extension of time and/or monetary compensation within the times prescribed are conditions precedent to the assertion of any such claims by Contractor and shall constitute a waiver by Contractor of any such claims for compensation or extension based upon that cause.
- c. Requests for compensation for delays must be substantiated by itemized data and records clearly showing that the work delayed was progressing according to the approved schedule and that the costs are directly attributable to the delay in the Work claimed. The Contractor shall provide written schedules demonstrating how the Work being delayed affects the approved schedule.
- d. No extension of time, additional compensation, or change in the Contract price shall be allowed for any delays caused in whole or in part by the Contractor, any subcontractors, or any supplier. (For unavoidable justified delays, see Section 19.9 of these General Conditions.)

- 19.5 Change Orders:** All change orders must indicate that the Contract Time for Completion is not changed or is either increased or decreased by a specific number of days. Any change or requested change in the Contract price shall also be included in the change order. The Contractor must provide written justification for an extension of the Time for Completion to the Architect and to the Roanoke Chapter. The written justification must demonstrate an anticipated actual increase in the time required to complete the Work beyond that allowed by the Contract as adjusted by prior change orders or amendments to the Contract, not just an increase or decrease in the time needed to complete some portion of the total Work. When a Critical Path Method (CPM) schedule is required by the Contract, or is used for the convenience of the Contractor, no increase to the Time for Completion shall be allowed unless, and then only to the extent that, the additional or changed Work increases the length of the critical path. Approved increases in time required to complete the Work shall be added to the Time for Completion. Decreases in time as a result of the change order shall be demonstrated by a decrease in the critical path of the work if CPM scheduling is properly used and updated by the Contractor. If not, the Roanoke Chapter shall determine the appropriate decrease by the best means possible. Approved decreases in the time needed to complete the Work shall be deducted from the Contract completion date. The change to time or Contract price

allowed by each change order shall include all time and monetary impacts of the change, whether the change order is considered alone or with all other changes during the course of the project. Failure to include a change to time and/or Contract price in a change order shall waive any claims the Contractor may have for any change to the time and/or Contract price unless the parties mutually agree in writing to postpone a determination of the change to time and price resulting from the change order. Such a determination may be postponed not more than forty-five (45) calendar days to give the Contractor an opportunity to demonstrate a change in the time and/or price needed to complete the Work. However, the Contractor shall continue with the Work as may be directed by the Architect and shall not stop work on the Project unless directed to do so by the Architect.

- 19.6 Extra Work:** The Roanoke Chapter reserves the right to make alterations or changes in the Work as the Work progresses. When any work is necessary to the proper completion of the project which was not provided for in the Contract, the Contractor shall do such work, but only when and as ordered in writing by the Architect. Payment for such extra work shall be made as hereinafter provided in Section 19.7.
- 19.7 Payment Methods for Extra Work:** The extra work done by the Contractor as authorized and approved by the Architect shall be paid for in the manner hereinafter described; and the compensation thus provided shall be accepted by the Contractor as payment in full for all labor, material, tools, equipment, incidentals, all superintendents' and timekeepers' services, all insurance, bonds, and all other reasonable overhead expenses incurred in the performance of the extra work. Payment for extra work may be made by one of the following methods, as agreed on in writing by the Architect and the Contractor before said extra work is commenced, subject to all other conditions of the Contract:
- Unit prices; or
 - Lump sum price; or
 - The cost of change in work plus ten percent (10%) of allowable costs. Allowable costs for purposes of this paragraph shall only include labor, material, sales tax, the rental of power tools and equipment actually used, or a reasonable price for the use of power tools and equipment owned by the Contractor based upon their life expectancy and purchase price, utilities, pro rata charges for foremen, and all payroll charges such as employer's FICA contribution, Public Liability and Workers' Compensation Insurance, but only if all such costs are incurred as the direct result of the changes in the Work. The change in cost for labor and material bonds and for performance bonds relative to the value of the extra work shall be allowable cost but shall not be marked up. If any subcontractor at any tier does all or part of the Work, the subcontractor's markup on that Work shall be fixed at fifteen percent (15%) of the allowable cost as defined herein.
- 19.8 Disputed Claims for Extra Work:** If one of the payment methods set forth in Section 19.7 is not agreed on by the Architect, the Roanoke Chapter may retain either an independent contractor to perform such extra work or use its own forces to perform such extra work and the Contractor shall cooperate fully with the independent contractor or Roanoke Chapter in its performance of the extra work. However, the Architect may also direct Contractor to perform such extra work and any dispute will be handled as set forth in Section 31 of these General Conditions.
- 19.9 Change in Contract Time or Contract Price:** The Contractor may request an extension of time or change in the Contract price should the Work be obstructed or delayed by any justified unavoidable delays not caused in whole or in part by the

Contractor, any subcontractor, or suppliers. However, delays caused by weather conditions will not be considered justified unavoidable delays unless they are caused by unusual weather as set forth in Section 4.2 of the Instructions to Bidders, in which case only an extension of time may be considered by Roanoke Chapter, but no additional compensation will be allowed for unusual weather. Furthermore, Contractor agrees that for any delays not caused by the Roanoke Chapter or any delays beyond the control of the Roanoke Chapter, no additional compensation will be due the Contractor and no change in the Contract price will be allowed by the Roanoke Chapter, only an extension of the Contract time will be considered by the Roanoke Chapter. The Contractor shall deliver requests for changes in the Contract price and/or completion time in writing to the Architect within ten (10) calendar days of the occurrence requiring the change. Approved changes that alter the time of the Contract shall extend the completion time by a period equivalent to the certified time lost by such occurrence. No change in Contract price and/or completion time shall be allowed if the above notice has not been properly given, such notice being a condition precedent to any such request by the Contractor. However, the Contractor shall continue with the Work as may be directed by the Architect and shall not stop work on the Project unless directed to do so by the Architect.

SECTION 20. PAYMENT FOR WORK

- 20.1 Monthly Construction Estimates:** Monthly construction estimates shall be submitted to Spectrum Design, P.C. 10 Church Avenue, SE Plaza Suite One, Roanoke VA 24011, no more than once every thirty (30) calendar days.
- 20.2 Preparing Progress Payment Requests:** In preparing construction estimates, the Contractor may request a progress payment based on the actual percentage of work completed during the preceding month. The estimate shall contain a breakdown of the total Contract amount, to include a separate breakdown of all approved change orders, into principal items of construction, showing the estimated quantity, unit price, and total for each item. In preparing progress payment requests, the material delivered on the site and preparatory work done may be taken into consideration, if properly documented, or as may be required by the Architect so that quantities can be verified. In addition to material delivered on the site, material such as large pieces of equipment and items purchased specifically for the project, but stored off the site, may be considered for payment, provided prior written approval is given by the Architect. The payment request shall include a properly-executed Waiver and Release of Mechanic's Liens in the form.
- 20.3 Progress Payments:** The Roanoke Chapter will make a progress payment to the Contractor on the basis of a duly certified and approved progress payment request for the work performed under the Contract. In the event that the Roanoke Chapter disagrees with the monthly construction progress payment request submitted by the Contractor, or in the event the As-Built Drawings are not being kept current, the Roanoke Chapter may withhold all or a portion of the progress payment until such dispute is resolved to the satisfaction of the Roanoke Chapter. If there are any objections or problems with the progress payment request, the Roanoke Chapter will notify the Contractor of such matters. If the progress payment request is approved by the Roanoke Chapter, payment will be made by the Roanoke Chapter to the Contractor not more than thirty (30) calendar days after such request has been approved. However, if there is an objection or problem with a progress payment request, the Contractor shall continue with the Work as may be directed by the Architect and shall not stop work on the Project unless directed to do so by the Architect. Any such disputes shall be handled as set forth in Section 31 of these General Conditions.

- 20.4 Retainage:** To ensure proper performance of the Contract, the Roanoke Chapter shall retain, unless stipulated otherwise, five percent (5%) of each progress payment until Final Acceptance of all work covered by the Contract. The Contractor may request that such retainage be paid into an escrow account on certain Contracts, pursuant to Section 2.2-4334 of the Code of Virginia. (See also Sections 6.2 and 14.6 of Instructions to Bidders.)
- 20.5 Ownership of Material and Work:** All material and work covered by progress payments shall become the property of the Roanoke Chapter. This provision shall not relieve the Contractor from the responsibility for all material and to maintain all completed work and to repair all damaged work. The Contractor shall not deem a progress payment as a waiver to complete the terms of the Contract or shift the risk of loss from the Contractor to the Roanoke Chapter. The Contractor warrants that Contractor has good title to all material, equipment, and supplies which Contractor uses in the Work or for which Contractor accepts payment in whole or in part.
- 20.6 Payments to Others by Contractor:** The Contractor agrees that Contractor will comply with the requirements of Section 2.2-4354 of the Code of Virginia regarding Contractor's payment to other entities and that Contractor will take one of the two actions permitted therein within seven (7) calendar days after receipt of amounts paid to Contractor by the Roanoke Chapter. The Contractor agrees that Contractor shall indemnify and hold the Roanoke Chapter harmless for any lawful claims resulting from failure of the Contractor to make prompt payments to all persons supplying him equipment, labor, tools, or material in prosecution and completion of the Work provided for in the Contract. In the event of such claims, the Roanoke Chapter may, after providing written notice to the Contractor, withhold from any progress and/or final payment the unpaid sum of money deemed sufficient to pay all lawful claims and associated costs in connection with the Contract.
- 20.7 Final Payment:** Within thirty (30) calendar days after the Final Acceptance of the Work, the Roanoke Chapter shall pay the Contractor the Final Payment, less all prior payments, damages, setoffs, liquidated damages, any amounts withheld from retainage, or any other amounts Contractor may owe the Roanoke Chapter for any reason whatever.
- 20.8 Payment and Acceptance:** No payment, final or otherwise, nor partial or entire use, occupancy, or acceptances of the Work by the Roanoke Chapter shall be an acceptance of any work or material not in accordance with the Contract, nor shall the same relieve the Contractor of any responsibility for any faulty material or workmanship or operate to release the Contractor or its surety from any obligation under the Contract or the Performance Bond or the Labor and Material Payment Bond.
- 20.9 Right to Audit:** The Contractor agrees that the Roanoke Chapter, and any approving Federal or State Agency or any of their duly authorized representatives, shall have access to any books, documents, papers, records, schedules and electronic data of the Contractor which are pertinent to this Project for the purpose of making an audit, examinations, excerpts, copies or transcriptions and that Contractor will provide copies of such items to Roanoke Chapter upon Roanoke Chapter's request, at no cost to Roanoke Chapter.

SECTION 21. LIQUIDATED DAMAGES

If liquidated damages are provided by the Contract, the following provisions shall apply:

- a. Subject to the provisions of the General Conditions granted for extension of time allowed for completion of the Work, if the Work is not substantially completed by the date required in the Contract, the Contractor shall owe to the Roanoke Chapter, not as a penalty but as liquidated damages, the sum stated in the Contract for liquidated damages for each and every calendar day of delay in substantial completion.
- b. Once the Work is substantially complete, the accrual of liquidated damages shall stop and the Contractor shall have thirty (30) calendar days in which to achieve Final Acceptance of the Work.
- c. If Final Acceptance of the Work is not achieved by the thirtieth (30th) calendar day after substantial completion, and if any extension of time is not granted by the Roanoke Chapter, the Contractor shall owe to the Roanoke Chapter, not as a penalty but as liquidated damages, the sum stated in the Contract as liquidated damages for each and every calendar day of delay in Final Acceptance. All such liquidated damages set forth in this Section 21 are in addition to any other damages the Roanoke Chapter may be entitled to recover from the Contractor.

SECTION 22. INSPECTION FOR SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE

- 22.1 Substantial Completion:** The Contractor shall notify the Roanoke Chapter, in writing, that the Work will be ready for inspection to determine if it is substantially complete and ready for testing on or after a certain date, which date shall be stated in the notice. The notice shall be given at least ten (10) calendar days in advance of said date and shall be forwarded through the Architect. Inspection and testing shall take place at a time mutually agreeable to the Contractor, Roanoke Chapter, and Architect. The inspection shall determine if substantial completion has been accomplished. If so, the Architect will issue a Certificate of Substantial Completion and attach a written list of unfinished Work and defective Work, commonly referred to as a "punch list", which must be finished and corrected to obtain Final Acceptance.
- 22.2 Request for Final Acceptance:** The Contractor shall notify the Architect, in writing, that the Work will be ready for final inspection and testing on or after a certain date, which date shall be stated in the notice. That inspection and any necessary testing shall be conducted in the same manner as the inspection for substantial completion. When the Work is finally and totally complete, including the elimination of all known deficiencies, the Work shall be finally accepted by the Roanoke Chapter and final payment shall be made in accordance with Section 20.7 of these General Conditions.
- 22.3 Final Inspection:** The Architect will conduct the final inspection, and may elect to have other persons of its choosing also participate in the inspection. If one or more reinspection is required, the Contractor shall reimburse the Roanoke Chapter for all costs of reinspection or, at the Roanoke Chapter's option, the costs may be deducted from payments due to the Contractor.
- 22.4 As-Built Drawings:** No Contract retainage will be released prior to receipt of all approved As-Built Drawings.

- 22.5 Final Acceptance:** Upon successful completion of the final inspection and all Work required by the Contract, including but not limited to the delivery of the following documents and items; As-Built drawings, operation and maintenance manuals, written warranties, Certificate of Substantial Completion, Affidavit of Payment of Claims, and Minority/Women Business Enterprise and Small Business Usage Status Form, the Architect will furnish a written Certificate of Final Acceptance of the Work to the Contractor. The Architect may accept the Work for occupancy or use while asserting claims against the Contractor, disputing the amount of compensation due to the Contractor, disputing the quality of the Work, its completion, or its compliance with the Contract Documents, and the like.
- 22.6 Release By Contractor:** The acceptance by the Contractor of the final payment or a payment designated as such shall be and does operate as a release by the Contractor of all claims by the Contractor against Roanoke Chapter and of all other liability of the Roanoke Chapter to the Contractor whatever, including liability for all things done or furnished in connection with the Work or the Contract.

SECTION 23. WARRANTY OF MATERIAL AND WORKMANSHIP

- 23.1** The Contractor warrants that, unless otherwise specified, all material and equipment incorporated in the Work under the Contract shall be new, in first class condition, and in accordance with the Contract Documents. The Contractor further warrants that all workmanship shall be of the highest quality and in accordance with the Contract Documents and shall be performed by persons qualified at their respective trades.
- 23.2** Work not conforming to these warranties shall be considered defective.
- 23.3** These warranties of material and workmanship are separate and independent from and in addition to any of the Contractor's other guarantees or obligations in this Contract, or that may arise by law.

SECTION 24. GUARANTEE OF WORK

- 24.1 One Year Warranty:** The Contractor does warrant and guarantee the Work against defects or deficiencies in the Work and in all material, equipment, and workmanship for a period of one (1) year from the date of Final Acceptance.
- 24.2 Defective Work:** The Contractor agrees it shall repair or replace, at Contractor's sole expense, and to the satisfaction of the Architect, any work, material, equipment, or part that is found, by the Architect, to be defective.
- 24.3 Repairs:** If, within any guarantee period, defects are noticed by the Architect which require repairs or changes in connection with the guaranteed work, those repairs or changes being in the determination of the Architect rendered necessary as the result of the use of material, equipment, or workmanship which is defective, inferior, or not in accordance with the terms of the Contract, then the Contractor shall, promptly upon receipt of notice from the Architect, such notice being given not more than four weeks after the expiration of any such guarantee period, and without any expense to the Roanoke Chapter:

- a. Place in satisfactory condition all guaranteed work and correct all defects therein; and
- b. Make good all damage to the structure, site, equipment, or contents thereof, which in the determination of the Architect is the result of the use of material, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract; and
- c. Make good any work or material or the equipment and contents of structures or the site disturbed in fulfilling any such guarantee.

- 24.4 Warranty Extension:** In any case, where in fulfilling the requirements of the Contract or any guarantee embraced in or required thereby, the Contractor disturbs, damages or repairs any work guaranteed under the Contract, Contractor shall restore such work to a condition satisfactory to the Architect and guarantee such restored work to the same extent and for a like additional period of time as it was originally guaranteed under this Contract.
- 24.5 Correction of Defects:** If the Contractor, after notice, fails to proceed promptly, but in no event longer than thirty (30) calendar days after such notice, unless otherwise agreed to by the Architect, to comply with the terms of the guarantee and/or correct the Work, the Roanoke Chapter may have the defects corrected by its own forces or another contractor and the Contractor and its surety shall be liable for all costs and expenses incurred in doing so.
- 24.6** Work within the Right of Way (for which a Right of Way Excavation permit is required) is required to be guaranteed for 24 months. A bond is required for this portion of the work for the entire 24 months.
- 24.7** Nothing contained in this section shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents or the law of Virginia, including liability for defective work.

SECTION 25. STOP WORK ORDER

In the event that conditions exist such that no work can or should continue, other than the routine closing of the site, the Contractor may submit to the Architect a request to stop work or the Architect on his/her own may issue a Stop Work Order. The Architect will, if he/she approves the request or issues the order himself/herself, deliver a written "Stop Work Order" to the Contractor stipulating the effective date and the Contract time remaining. The Work, other than the routine closing of the site, and Contract time shall not again be started until a written "Resume Work Order" is received by the Contractor from the Architect. When the Work is stopped at the request of the Contractor and through no fault of the Contractor, the Contractor may only recover from the Roanoke Chapter payment for the cost of the Work actually performed, together with reasonable overhead and profit thereon up to that time, but profit shall be recovered only to the extent that the Contractor can demonstrate that it would have had profit on the entire Contract if it had completed the Work. The Contractor may not receive profit or any other type of compensation for parts of the Work not performed, including, but not limited to, home office overhead or any other such costs. The Contractor may also recover the actual cost of physically closing down the jobsite, but no other costs of the Stop Work Order. The Roanoke Chapter may offset any claims it may have against the Contractor against the amounts due to

the Contractor. In no event shall the Stop Work Order to the Contractor relieve in any way the obligations of the Contractor's surety on its payment and performance bonds. When work is stopped by the Architect due to any fault of the Contractor, the Contractor may not recover any of the above costs or items or any other costs, profits, expenses, or damages of any type.

SECTION 26. TERMINATION OF CONTRACT FOR CAUSE

- 26.1 Termination for Cause:** If the Contractor should be adjudged a bankrupt, or if it should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, the Roanoke Chapter may terminate the Contract. If the Contractor should refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper material, or if it should fail to make prompt payment to subcontractors or suppliers of material or labor, or disregard laws, ordinances, or the written instructions of the Architect, or otherwise fails to comply with any of the terms or provisions of this Contract including, but not limited to, poor services, work or material, then the Roanoke Chapter may terminate this Contract. In no event shall termination for cause terminate the obligations of the Contractor's surety on its payment and performance bonds.
- 26.2 Possession of Work:** Upon termination of the Contract, the Roanoke Chapter may take possession of the premises and of all material, tools, and appliances thereon and finish the Work by whatever method the Roanoke Chapter may deem expedient. In such case the Contractor shall not be entitled to receive any further payment of any type. If the expense of finishing the Work, including compensation for additional managerial and administrative services, shall exceed the unpaid balance of the Contract price, the Contractor shall pay the difference to the Roanoke Chapter, together with any other cost or expenses of terminating the Contract and having it completed by others, together with any and all other damages Roanoke Chapter may be entitled to from the Contractor.
- 26.3 Alternative Termination:** If it should be judicially determined that the Roanoke Chapter improperly terminated this Contract for cause, then the termination shall be deemed to be a termination for the convenience of the Roanoke Chapter.
- 26.4 Termination Rights:** Termination of this Contract under Section 26 or Section 27 is without prejudice and in addition to any other rights or remedies of the Roanoke Chapter against the Contractor.

SECTION 27. TERMINATION FOR CONVENIENCE OF ROANOKE CHAPTER

- 27.1 Termination for Convenience:** The Roanoke Chapter, at its discretion, may terminate this Contract at any time without cause, in whole or in part, upon giving the Contractor written notice of such termination. Upon such termination, the Contractor shall immediately cease work and remove from the jobsite all of its labor forces, equipment, and material as Roanoke Chapter elects not to purchase or to assume in the manner hereinafter provided. Upon such termination, the Contractor shall take such steps as Roanoke Chapter may require to assign to the Roanoke Chapter the Contractor's interest in all subcontracts and purchase orders designated by Roanoke Chapter. After all such steps have been taken to Roanoke Chapter's satisfaction, the Contractor shall receive as full compensation for termination and assignment only the following:
 - a. All amounts then otherwise due under the terms of this Contract for actual work performed and approved by Roanoke Chapter; and

- b. Reasonable compensation for the actual cost of demobilization incurred by the Contractor as a direct result of such termination. The Contractor shall not be entitled to any compensation for lost profits or for any other type of contractual compensation or damage, other than those provided by the preceding sentence, including any on site or home office overhead. Upon payment of the foregoing, Roanoke Chapter shall have no further liabilities or obligations to Contractor of any nature.

27.2 Termination Effect on Surety: In no event shall termination for the convenience of the Roanoke Chapter terminate the obligation of the Contractor's surety on its payment and performance bonds.

SECTION 28. PRECONSTRUCTION CONFERENCE

The Architect shall notify the Contractor as to the location, date, and time of a preconstruction conference to confirm procedures for processing construction estimates for payment and related submissions and to discuss other matters pertaining to scheduling and execution of the Work.

SECTION 29. PROJECT SIGN(S)

The Contractor shall supply, erect, and maintain Project Sign(s) in accordance with the Roanoke Chapter, NRHS Standard Detail. The sign(s) shall be located as directed by the Architect. The Contractor shall not display any other signs or advertisements.

SECTION 30. ASSIGNMENTS

The Contractor shall not assign, in whole or in part, any of its rights, duties, or obligations under this Contract with the Roanoke Chapter without the prior written consent of the Roanoke Chapter.

SECTION 31. CONTRACTUAL DISPUTES

Contractual claims, whether for money or for other relief, including any disputes as to change orders or extra work, shall be submitted, in writing, no later than sixty (60) calendar days after final payment or payment designated as a final payment; however, written notice of the Contractor's intention to file such claim must be given at the time of the occurrence or beginning of the work upon which the claim is based. Such notice is a condition precedent to the assertion of any such claim by the Contractor. A written decision upon any such claims will be made by the Roanoke Chapter President or his/her designee (hereafter Roanoke Chapter President) within thirty (30) calendar days after submittal of the claim and any practically available additional supporting evidence required by the Roanoke Chapter President. The Contractor may not institute legal action prior to receipt of the Roanoke Chapter's decision on the claim unless the Roanoke Chapter President fails to render such decision within one hundred twenty (120) calendar days from submittal of its claim. The decision of the Roanoke Chapter President shall be final and conclusive unless the Contractor within six (6) months of the date of the final decision on a claim or from expiration of the 120 day time limit, whichever occurs first, initiates legal action as provided in Section 2.2 - 4364, of the Code of Virginia. Failure of the Roanoke Chapter to render a decision within said one hundred twenty (120) calendar days shall not result in the Contractor being awarded the relief claimed nor shall it result in any other relief or penalty.

The sole result of the Roanoke Chapter's failure to render a decision within said one hundred twenty (120) calendar days shall be Contractor's right to immediately institute legal action. No administrative appeals procedure pursuant to Section 2.2 - 4365, of the Code of Virginia, has been established for contractual claims under this Contract.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK.

ROANOKE CHAPTER, NRHS

SUPPLEMENTAL GENERAL CONDITIONS

Contractor agrees to fully, properly, and timely provide and perform all the work, services, materials, and other items required for this Project in accordance with the Contract, including the VDOT Agreements (copies of which is included in Appendix D) and the items contained in the Supplemental General Conditions. The Supplemental General Conditions are hereby deemed a part of the Contract for this Project and are binding upon the Contractor. Furthermore, if the Contractor discovers that there are any conflicts between the terms and provisions of these Supplemental General Conditions and any other Contract documents, the Contractor shall immediately notify the Architect, in writing, of any such conflict(s). However, the provisions of the Supplemental General Conditions are intended to be and shall be construed to be consistent with all other terms and provisions in the ITB and the Contract documents, but if a court or agency of competent jurisdiction determines that a conflict should exist between them, and to the extent of any such conflict, the more stringent requirements shall apply unless otherwise required by the rules, regulations, and/or procedures of VDOT, the law, or the Federal and/or State agencies involved in this Project, in which case those items will take precedence in that order unless otherwise required by law.

SECTION 1. CERTIFICATIONS.

All certifications required by VDOT, local, State, or Federal laws, rules, and regulations shall be completed and submitted by each Bidder. Failure to do so may result in the bid being considered nonresponsive. A Bidder Checklist for Bids is included with the bid documents as an aid to assist Bidders. However, it may not be all inclusive and each Bidder is solely responsible for making sure such Bidder has reviewed all the bid documents and has completed and submitted all required certifications, whether or not set forth in the above Checklist.

SECTION 2. INCORPORATION OF VDOT REQUIRED DOCUMENTS.

- A. VDOT requires that certain VDOT required documents be included in the bid documents and the Contract for this Project. Accordingly, documents provided by VDOT are included with the bid documents and shall be deemed to be a part of the Contract for this Project. Furthermore, any documents and terms VDOT requires to be a part of the Contract for this Project are hereby deemed to be included and made a part of the Contract for this Project and shall be fully enforceable by the Roanoke Chapter and/or VDOT against the Contractor.
- B. The following VDOT documents are hereby made a part of the Contract for this Project: (See Appendix D for a copy of the items listed below.)
 1. VDOT SF010CF-0309, FHWA 1273, Memorandum and CFR Change, dated May 1, 2012. (18 pages)
 2. FHWA Memorandum, dated May 22, 2007. (2 pages)

3. VDOT Special Provision for Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246), revised July, 2008. (6 pages)
4. VDOT Form C-63 – DBE and SWAM Payment Compliance Report With Instructions, revised July 6, 2007. (4 pages)
5. VDOT Special Provision S107HF1, Section 107.15, Use of Disadvantaged Business Enterprises (DBEs), dated December 10, 2010. (20 pages)
6. USDOT Order 1050.2 – Appendix A, dated November, 2008. (pages A-1 and A-2)
7. VDOT – General Decision: VA 130068 1/4/2013 VA68. (16 pages)
8. VDOT – SF001AF-0708, Predetermined Minimum Wage Rates, revised July, 2008. (1 page)
9. VDOT Form C-48, Subcontractor/Supplier Solicitation and Utilization Form (All Bidders), dated 2/23/11. (1 page)
10. VDOT Form C-49, DBE Good Faith Efforts Documentation, dated 7/7/11. (10 pages)
11. VDOT Form C-104, No Collusion Certification, revised 7/13/05. (1 page)
12. VDOT Form C-105, Affidavit, revised 7/13/05. (2 pages)
13. VDOT Form C-111, Minimum DBE Requirements, revised 2/15/11. (1 page)
14. VDOT Form C-112, Certification of Binding Agreement, revised 2/15/11. (1 page)

(NOTE: In addition to the above listed VDOT documents, there are other VDOT documents set forth throughout the Technical Specifications of the ITB and Contract.)

SECTION 3. BUY AMERICA (USE OF DOMESTIC MATERIAL).

VDOT Special Provision S102CF2, Use of Domestic Material, dated July 26, 2013, Section 102.05, is included in Appendix D and made a part of this Contract and Contractor shall properly and timely comply with such terms and provisions. If Contractor fails to comply with such terms and provisions, Contractor shall make any and all changes and corrections to the Project and Work in order to be compliant and all costs and expenses shall be the responsibility of the Contractor and not the responsibility of the Roanoke Chapter.

SECTION 4. RECOVERY OF FUNDS PAID FOR UNAUTHORIZED AND/OR UNAPPROVED WORK.

Contractor shall repay to the Roanoke Chapter any funds Contractor may have received for any Work, services, and/or materials Contractor provided and/or performed for this Project if any such items were not properly authorized and approved by the Roanoke Chapter, VDOT, and any other approving local, State, or Federal agency, and/or for any funds the Roanoke Chapter may have had to repay to VDOT and/or any State or Federal agency due to the actions and/or omissions of the Contractor, including but not limited to any reporting or record keeping requirements.

SECTION 5. COMPLIANCE WITH VDOT AND OTHER REGULATIONS.

The Contractor shall at all times comply with all applicable VDOT, local, State, and/or Federal regulations, policies, procedures, and directives, as they now exist or may be amended or promulgated from time to time during the term of this Contract, including without limitation those listed directly and/or by reference in the ITB, which ITB is made a part of this Contract by reference. The Contractor's failure to so comply shall constitute a material breach of this Contract.

SECTION 6. INCORPORATION OF VDOT, LOCAL, STATE, AND/OR FEDERAL TERMS.

The preceding terms and provisions include certain standard terms and conditions required by VDOT, local, State, and/or Federal agencies, whether or not expressly set forth in the ITB and/or the Contract provisions. All contractual provisions required by VDOT, local, State, and/or Federal agencies involved in this Project are hereby incorporated by reference. Anything to the contrary notwithstanding, all Federal, VDOT, State, and/or local mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Contract with the order of precedence being in that order unless otherwise required by law. The Contractor agrees to and shall not perform any act, fail to perform any act, or refuse to comply with any request that would cause the Roanoke Chapter, NRHS to be in violation of any local, VDOT, State, and/or Federal terms and conditions.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK.

Section 01000

Special Conditions

1. Part 1 General

- 1.1. **Location of Work** - The work of this contract consists of the general construction to complete the interior, exterior (including windows, soffits, gables and brickwork) landscaping and parking lot of the Virginian Railway Passenger Station, 1402 Jefferson Street, SE, Roanoke, Va.
- 1.2. **Delay of Notice to Proceed** – The Notice to Proceed will not be issued until tbd, or shortly thereafter.
- 1.3. Since this project is using federal funds for implementation, the Contractor shall comply with all provisions in the Federal Labor Standards Section.
- 1.4. The plan set is incomplete unless accompanied by the Roanoke Chapter project manual. Likewise, this project manual is incomplete unless accompanied by the plan set.
- 1.5. The Contractor shall provide the Roanoke Chapter's project manager, Roanoke Chapter's inspector, or other Roanoke Chapter representatives, safe access to all areas of work throughout the course of the construction project and for final inspection. Safe access includes the use of man-lifts, operated by a Contractor's representative, or any other such equipment as needed to reach areas of inspection.
- 1.6. A Request for Information Form is attached in Appendix C for the Contractor's use.
- 1.7. **Contractor Superintendent** – At all times during the project, the Contractor shall be required to have a competent Superintendent on site.
- 1.8. In accordance with Section 29 of the General Conditions, one week prior to mobilization for construction activities, the Contractor shall erect a construction sign on site to notify the business owners, commuters and residents about the construction activities. The sign shall indicate:

- Project Name
- Contractor Name
- Construction Start Date

Additional signs shall be required at any detours or road/alley closures one week prior to mobilization.

1.9. If the project involves a road or alley closure then the Contractor shall provide a message board or sign at each road closure prior to the mobilization and commencement of construction activities. This sign shall indicate:

- Project Name
- Closure Time Period (Closure Date to Re-opening Date)

1.10. Safety

1.10.1. Citizen and workman safety shall be given top priority at all times.

1.10.2. See Section 17 of the General Conditions for additional requirements.

2. Traffic Maintenance, Work Area Protection, and Access

2.1. Traffic Maintenance - All traffic control shall be subject to approval by the City Traffic Engineer (Transportation Department 540-853-2385). Changes to the traffic control plan, as directed by the City Traffic Engineer, shall not be a basis for additional compensation. The Contractor shall submit a traffic control plan sealed by a Professional Engineer registered in Virginia for review and approval prior to mobilization. All lane and street closures and detours shall be coordinated with the Transportation Department. Note that the Engineering and Transportation Departments are separate departments.

2.2. Work Area Protection - If a temporary road closure is required on the project, a traffic control plan conforming to the Virginia Work Area Protection Manual shall be submitted to the City of Roanoke for approval prior to starting construction. Contractor shall be required to provide all signage and devices in accordance with the Virginia Work Area Protection manual. In addition, the Contractor shall provide and maintain all signs for road/alley detours. **The City of Roanoke will not provide any signs.**

2.3. Access - Coordinate citizens' access to driveways as much as possible. Access to properties along the project route shall be maintained during construction.

2.4. Contractor shall be responsible for providing all signage for the project. The Contractor shall not rely on Roanoke Chapter or City personnel to provide any signage.

2.5. There may be other Contractors in the adjoining areas. Incidental coordination with the Contractors may be required.

3. Utilities

- 3.1. Existing utilities along the project site are shown on the plans based on available records. The location of all utilities shall be verified prior to the start of construction. Existing utilities shall be supported and maintained as necessary during construction.
- 3.2. The Contractor shall contact Miss Utility (811 or 1-800-552-7001) for location of utilities at least 48 hours prior to construction.
- 3.3. The Contractor shall verify tops and inverts of all existing structures before fabrication of new structures.
- 3.4. The Contractor shall coordinate construction with utility companies where existing utilities need to be relocated. The Contractor shall allow adequate time for the relocation of utilities by utility companies should such be necessary. No additional time or compensation shall be provided for delays that result from relocation of utilities.

4. Required Permits

- 4.1. City of Roanoke Right of Way Excavation Permit for any work performed in the City of Roanoke Right of Way.
 - 4.1.1. Contractor shall apply and pay for the permit at the Development Assistance Center (DAC) located in the municipal building - 215 Church Ave, SW).
- 4.2. A City of Roanoke Land Disturbing Permit shall be required. The Contractor shall be required to have a Registered Land Disturber, as specified by the Virginia Department of Conservation and Recreation, on the permit and shall pay fees associated with the issuance of the permit. The City of Roanoke permit number is CP090025.
- 4.3. A City of Roanoke Land Disturbing Permit shall not be required for work in the City Right of Way. In addition, a Land Disturbing permit shall not be required on property parcels where land disturbance is less than 2,000 square feet at a time. The Contractor shall be responsible for paying any fees and preparing the documents to obtain the permit should the Contractor wish to disturb over 2,000 square feet at a time.

5. Grass Establishment

- 5.1. Substantial completion of the project may occur outside of the permanent seeding window. Therefore, the contractor will apply temporary seed and mulch after final grades are established. The project manager will issue a Stop Work Order until the permanent seeding window is opened (September 1st). Once in the permanent seeding window, the project manager will then issue a Resume Work

Order and a time extension will be given. The contractor will then apply permanent seed, establish final stabilization and request final acceptance. Retainage will not be paid until final acceptance is issued by the City project manager. The Contractor will not be reimbursed for remobilization due to the seeding growth window. Unless noted otherwise in the specifications, Southern Lawn shall be used as the permanent seed mixture.

6. Inspectors

- 6.1. Not Used.
- 6.2. Not Used.
- 6.3. The Contractor shall remove from the project site any employee or subcontractor employee deemed disorderly in accordance with Section 5.2 of the General Conditions.

7. Erosion and Sediment Control

- 7.1. Payment for Erosion and Sediment Control devices shall not only include installation and maintenance of the device but also the removal and disposal of the device after final stabilization is achieved. Additional mobilization for disposal of Erosion and Sediment Control devices will not be a basis for a increase in contract amount.

8. Storage of Fuel Tanks

- 8.1. No fuel tanks shall be stored overnight on the City right-of-way system or project site.

End of Section

**SECTION 01026
SCHEDULE OF VALUES**

1. GENERAL

1.1 DESCRIPTION: Submit a Schedule of Values with line items allocated to the various portions of the Work, as soon as feasible but not less than 14 days prior to the submission of the first Application for Payment. All values for abatement work associated with the Brownfield Grant shall be broken out as separate line items for payment from these grant funds. Coordinate preparation of Schedule of Values and Construction Schedule. Upon request, support the values with data which will substantiate their correctness.

1.2 RELATED REQUIREMENTS:

Application for Payment - Section 01027

Construction Schedules and Reports - Section 01310

1.3 FORM:

A. The Schedule shall be prepared on AIA Document G703 and shall be tabulated to correspond with the breakdown of work noted in Article 1.4 Contents, Identity Schedule with:

1. Title of Project and location;
2. Architect and Commission number;
3. Name and Address of Contractor;
4. Contract designation
5. Date of Submission

B. Where the Work is separated into phases, such as the abatement work associated with the Brownfield Grant, which require separately phased or funded payments to the contractor, provide sub-schedules showing values correlated with each phase of payment.

C. List the installed value of the component parts of the Work in sufficient detail to facilitate continued evaluation of payment requests during construction.

D. The sum of all budget estimate values listed in the schedule shall equal not more than the total Contract Amount.

1.4 CONTENTS:

DIVISION 1 – PROJECT REQUIREMENTS:

01000 Special Conditions

01026 Schedule of Values

01027 Application for Payment

01110 Summary of Work

01200 Measurement and Payment

01310 Project Meetings

01350 Submittals

01400 Quality Requirements

01420 Reference Standards

01500 Temporary Facilities

01520 Field Offices and Sheds

01560 Barriers
01600 Material and Equipment
01770 Project Closeout
01785 Operation and Maintenance Data
01815 System Demonstration and Training

DIVISION 2 – EXISTING CONDITIONS:

02231 DEMOLITION
02300 EXCAVATION
02370 EROSION AND SEDIMENT CONTROL

DIVISION 4 – MASONRY:

04501 MASONRY RESTORATION

DIVISION 6 – WOODS AND PLASTICS:

06000 WOOD REHABILITATION WORK
06100 ROUGH CARPENTRY
06200 FINISH CARPENTRY

DIVISION 7 - THERMAL AND MOISTURE PROTECTION:

07605 SHEET METAL
07901 JOINT SEALANTS

DIVISION 8 – DOORS AND WINDOWS:

08212 STILE AND RAIL WOOD DOORS
08610 WOOD WINDOWS
08711 DOOR HARDWARE
08800 GLAZING

DIVISION 9 – FINISHES:

09200 LATH AND PLASTER
09255 GYPSUM BOARD ASSEMBLIES
09900 PAINTING

DIVISION 10 – SPECIALTIES:

10 14 00 SIGNS
10 14 10 SPECIALTY SIGNAGE
10522 FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

DIVISION 12 – FURNISHINGS

12 93 00 SITE FURNISHINGS

DIVISION 31 – EARTHWORK:

31 05 13 SOIL MATERIALS
31 05 16 AGGREGATE MATERIALS
31 09 00 GEOTECHNICAL ENGINEERING, INSPECTION AND TESTING
31 10 00 SITE PREPARATION AND CLEARING
31 22 13 ROUGH GRADING
31 23 16 EXCAVATING
31 23 17 UTILITY TRENCHING AND BACKFILLING
31 23 23 BACKFILLING

31 25 13 EROSION AND SEDIMENT CONTROL
31 31 16 TERMITE CONTROL

DIVISION 32 – EXTERIOR IMPROVEMENTS:

32 12 16 ASPHALT PAVEMENT
32 13 13 PORTLAND CEMENT CONCRETE PAVEMENT
32 14 00 UNIT PAVING
32 17 13 PARKING BUMPERS
32 17 23 PAVEMENT MARKING AND SIGNAGE
32 31 19 DECORATIVE METAL FENCING
32 32 19 STONE MASONRY ASSEMBLY
32 91 19 LANDSCAPE GRADING
32 91 19.13 TOPSOIL
32 92 19 PERMANENT SEEDING
32 93 00 PLANTING

DIVISION 33 – UTILITIES:

33 05 13 PRECAST TRENCH DRAINS
33 11 16 WATER MAINS AND SERVICES
33 13 00 DISINFECTION OF WATER DISTRIBUTION SYSTEM
33 31 00 SITE SANITARY GRAVITY SEWER SYSTEM
33 41 00 SITE STORM DRAINAGE SYSTEM

END OF SECTION 01026

SECTION 01027
APPLICATION FOR PAYMENTS

1. GENERAL

- 1.1 **SCOPE:** Submit each Application for Payment to the Architect in accordance with the schedule established by the General Conditions of the Contract and the Agreement Between the Owner and the Contractor. Enclose with each application the Progress Reports specified in Section 01310 –CONSTRUCTION SCHEDULE AND REPORTS.
- 1.2 **FORMAT AND DATA REQUIRED:** Submit itemized applications typed on AIA Document G702, Application and Certificate for Payment, and Continuation Sheets G703 as specified in Section 01026 – SCHEDULE OF VALUES.

1.3 PREPARATION OF APPLICATION FOR PROGRESS PAYMENT

A. Application form:

1. Fill in the required information, including that for Change Orders executed prior to the date of the submittal of application.
2. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheets.
3. Execute certification with the Notarized original signature of a responsible officer of the construction firm on each copy.

B. Continuation Sheets:

1. Fill in total list of all schedule component items of work, with item number and the scheduled dollar value for each item, Listing of component items of work shall be in accordance with Section number 01026-SCHEDULE OF VALUES
2. Fill in dollar value in the scheduled Value column for each scheduled line item when work has been performed or products stored. Round off values to nearest dollar.
3. List each Change Order executed prior to the date of submission, at the end of the continuation sheets. The cost of each Change Order shall be tabulated to correspond with applicable line items of the Schedule of Values. Each change Order shall have the breakdown of work.

1.4. SUBSTANTIATING DATA:

- A. When the Architect requires substantiating date, Contractor shall submit suitable information, with a cover letter identifying:
 1. Project.
 2. Application number and date.

3. Detailed list of enclosures.

And for stored products:

4. Item number and identification as shown on application.
5. Description of specific material
6. Location of stored products.
7. Certification of insurance for Materials stored off the Site.

- B. Submit one copy of data and cover letter for each copy off the site.

1.5 PREPARATION OF APPLICATION FOR FINAL PAYMENT:

- A. Fill in Application form as specified for progress payments.
- B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700-CONTRACT CLOSEOUT.

1.6 SUBMITTAL PROCEDURE:

- A. Submit four copies of Application for Payment to Architect at the times stipulated in the Agreement.
- B. When Architect finds the Application properly completed and correct, he will transmit a Certificate for Payment to Owner, with a copy to Contractor.

END OF SECTION 01027

**SECTION 01110
SUMMARY OF WORK**

PART 1 GENERAL

1.1 DESCRIPTION

- A. The work of this contract consists of the general construction to complete the interior, exterior (including windows, soffits, gables and brickwork) landscaping and parking lot of the Virginian Railway passenger station. The work includes all materials, labor, tools, equipment, utility and transportation services, and all incidental items necessary to perform and complete, in a workmanlike manner, the work required within this project.
- B. All work will be performed under a single contract.

1.2 LOCATION

- A. The site is located at the intersection of 1402 South Jefferson Street and Williamson Road in Roanoke, Virginia.

1.3 CONTRACTOR'S USE OF PREMISES

- A. Install crushed stone where vehicles will travel or park. Cleanup and restoration of staging area to original conditions shall be done following need for use of this area or at the end of construction.
- B. Contractor shall construct and maintain a temporary crushed rock entrance per the Va. ESC Handbook. Temporary entrance shall include any and all measures and materials necessary to allow drainage to pass beneath the temporary entrance. The Contractor shall also maintain access for the Owner, their representatives, governing agencies, inspectors and other official business throughout the construction period.
- C. Confine storage of materials to within the construction limits as indicated on the drawings.
- D. Preservation of Natural Features: Confine all operations to work limits of the project. Prevent damage to natural surroundings. Restore damaged areas, repairing or replacing damaged trees and plants, at no additional expense to the Owner.
 1. Provide temporary barriers to protect existing trees and plants and root zones.
 2. Do not remove, injure, or destroy trees or other plants without prior approval. Consult with Contracting Officer and remove agreed-on roots and branches that interfere with construction.
 3. Do not fasten ropes, cables, or guys to existing trees.
 4. Carefully supervise excavating, grading, filling, and other construction operations near trees to prevent damage.
- E. Existing Utilities: Notify Contracting Officer and utility companies of proposed locations and times for excavation.

1. Contractor shall be responsible for locating and preventing damage to known utilities. If damage occurs, repair utility at no additional expense to the Owner.
2. If damage occurs to an unknown utility, repair any damage caused to the utility. An equitable adjustment will be made in accordance with the Changes clause of the General Conditions.

F. Hauling Restrictions: Comply with all legal load restrictions in the hauling of materials.

1.4 FIELD VERIFICATION

- A. Field verify all new and existing dimensions affecting the work of this contract before ordering products.

1.5 SOILS INVESTIGATION REPORT

- A. Refer to Section 02110 for further information.

PART 2 PRODUCTS NOT USED.

PART 3 EXECUTION NOT USED.

PART 4 MEASUREMENT AND PAYMENT

4.1 SUMMARY OF WORK

- A. Payment will be included in the bid item to which this work relates.

END OF SECTION

Section 01200

Measurement and Payment

1. General

1.1. Unit Prices

1.1.1. Unit prices on the Bid Form shall include the cost and profit of providing all labor, materials, testing, tools and equipment necessary to perform all work in accordance with contract documents. No separate payment shall be made for incidental work relating to Bid Items.

1.2. Basis of Payment

1.2.1. The Contract is based on the unit prices listed on the Bid Form. The estimated quantities listed on the Bid Form are for the purpose of bid comparisons. All bid item payments shall be made based on actual provided quantities measured and accepted in place.

1.2.2. Include the cost for items not listed in the Bid Form, which are mentioned in the specifications, indicated on the drawings, or normally a part of the work described by the Contract Documents, in the cost of the appropriate items which are listed in the Bid Form.

1.2.3. No separate payments shall be made for work, material, equipment, or other expense which is not part of construction items listed in the Bid Form.

1.2.4. Payment can only be requested for in-place materials. Payment for stored materials, on-site or off-site, can not be requested.

2. Payment for Work

2.1.1. Pay requests shall be submitted in tabular form including all pay items listed on the bid form and the unit price for each pay item along the total completed quantity for each item. The form shall have signature lines for the Contractor, Roanoke Chapter NRHS Project Manager, and Roanoke Chapter NRHS Inspector. Pay requests are to be limited to one per thirty (30) calendar days.

3. Products – Not Used

4. **Execution** - Each bid item shall include full compensation for performing the work specified in the bid items and furnishing all materials, labor, tools, equipment, profit and incidentals as required. Each bid item shall be paid on a percentage completed for that bid item unless otherwise noted.

4.1. Mobilization – Shall include the performance of construction preparatory operations, including the movement of personnel and equipment to the project site, installation of project signs, payment of permits, payment of performance and payment bond and other insurance premiums and for establishment of facilities necessary to begin work on a substantial phase of the contract. The first payment of 50% of the lump sum price may be requested on the first estimate following partial mobilization and initiation of construction work. The second and final payment request may be requested on the next estimate following completion of substantial mobilization.

4.1.1. No additional payment shall be made for demobilization or remobilization due to shutdowns, removal of E&S devices, temporary stop work orders due to seeding windows, suspensions of work or for other mobilization activities.

4.2. Construction Stakeout Survey

4.2.1. This bid item shall be paid on lump sum basis. Pay request may be made based on the percentage of completion.

4.3. Clearing and Grubbing – Shall be paid on a lump sum basis. Payment for this item is for the proper removal and disposal of all items indicated on the plans. Pay requests may be made based on the percentage of completion. This item includes tree removal or transplanting, as indicated on the plans.

4.4. Earthwork, Unclassified Except for Rock – Shall be paid on lump sum basis for the greenway trail. The lump sum price shall include stripping of topsoil, excavating, placement of fill, transporting, compacting, preparation of subgrade for greenway, and disposal of excess material. Pay requests may be made for this item based on the percentage of completion. This item does not include removal of unsuitable material or shoulder restoration.

4.5. Rock Excavation – Shall be paid on a cubic yard basis. The unit price shall include excavation, blasting (if allowed and required), transporting, and disposal of excess or unsuitable material. Pay request may be made for this item based on the in place measurement of exposed by undisturbed rock including required over-excavation for bedding by person authorized by City project manager.

4.6. Pavement Restoration – This bid item shall be measured and paid for per square yard. The restoration includes the milling, repaving, and disposal operations. The asphalt shall be milled to a minimum depth of 2", unless the asphalt restoration is specified to provide positive drainage. In areas where positive drainage is specified, additional milling shall be required so that when the repaving is complete positive drainage of the new asphalt surface is achieved.

- 4.6.1. This bid item shall include repaving the milled areas with VDOT SM9.5A.
 - 4.6.2. This bid item shall include any saw cutting needed to provide a uniform edge to adjacent concrete or asphalt that is to be left in place.
 - 4.6.3. This bid item shall include a tack coat CRS-1 asphalt to the existing concrete approach slabs, existing road bed, and curbs before application of asphalt paving.
- 4.7. Greenway Trail – Shall be measured and paid for per linear foot complete in place. The price shall include all labor and materials required for placing and compacting VDOT No. 21A aggregate base over prepared subgrade, prime coat, placing and compacting VDOT SM-9.5A asphalt surface material, and shoulder restoration. Greenway trail section shall be as shown on plans. This bid item shall include fabrication and installation of trail-related traffic signs, bollards, relocating guardrail, and demolition as shown on plans.
- 4.8. Traffic Maintenance and Work Area Protection - Shall be paid on a lump sum basis. The lump sum price shall include furnishing and installing all materials and manpower. The lump sum price should also include maintaining the work area in accordance with Virginia Work Area Protection Manual. Pay requests may be made for this item based on a percentage of completion for the project. All traffic control shall be subject to approval by the City Traffic Engineer (Transportation Department 540-853-2385). Changes to the traffic control plan, as directed by the City Traffic Engineer, shall not be a basis for additional compensation. The Contractor shall submit a traffic control plan sealed by a Professional Engineer registered in Virginia for review and approval prior to mobilization. All lane and street closures and detours shall be coordinated with the Transportation Department. Note that the Engineering and Transportation Departments are separate departments.
- 4.9. Curb (City Standard) - Shall be measured in linear feet along the face of curb, complete in place. No additional compensation shall be allowed for radial curb. The unit price shall include all labor and materials required for excavation, backfill and compaction of VDOT 21A Aggregate, forming using steel forms in good condition (including face form), placement, finishing, curing, and hot/cold weather protection of concrete, expansion and crack control joints, neat saw-cutting of existing pavement and asphalt restoration in front of curb. This item also includes demolition of existing concrete, demolition to provide a neat, uniform tie-in, demolition of existing pavements and shoulder restoration behind the curb.
- 4.10. Curb and Gutter (City Standard)

- 4.10.1. This bid item shall be measured in linear feet along the face of curb, complete in place. No additional compensation shall be allowed for radial curb.
- 4.10.2. This bid item shall include excavation; backfill and compaction of VDOT 21A Aggregate; forming using steel forms in good condition (including face form), placement, finishing, curing, and hot/cold weather protection of concrete; expansion and crack control joints, neat saw-cutting of existing pavement; and asphalt restoration in front of the curb and gutter system.
- 4.10.3. This bid item shall include demolition of existing concrete, demolition to provide a neat, uniform tie-in, demolition of existing pavements and shoulder restoration behind the curb.
- 4.11. Handicap Ramp (City Standard) - Shall be measured and paid for per each, complete in place. The unit price shall include all labor and materials required for excavation; backfill and compaction of VDOT 21A aggregate, forming using steel forms in good condition (including face form), placement, finishing, curing, and hot/cold weather protection of concrete, length of gutter, neat saw-cutting of existing pavement and concrete, and asphalt restoration in front of the ramp. This item also includes demolition of existing concrete to provide a neat, uniform tie-in; demolition of existing pavements, shoulder restoration and installation of a cast iron detectable warning plates. Minimum slab thickness shall be 7 inches. Note that the width, number of plates, and geometry varies at each location.
- 4.12. Concrete Sidewalk (City Standard) - Shall be measured in square feet, complete in place. No additional compensation shall be allowed for radial walk. The unit price shall include all labor and materials required for excavation; backfill and compaction of VDOT 21A aggregate, forming using steel forms in good condition; welded wire fabric reinforcement, placement, finishing, curing, and hot/cold weather protection of concrete, expansion and crack control joints. This item also includes demolition of existing concrete, demolition to provide a neat, uniform tie-in, and shoulder restoration.
- 4.13. Bus Shelter Slab - Shall be measured in square feet, complete in place. No additional compensation shall be allowed for radial walk. The unit price shall include all labor and materials required for excavation; backfill and compaction of 6" VDOT 21A aggregate, forming using steel forms in good condition; grounding conductor and rod, welded wire fabric reinforcement, placement, finishing, curing, and hot/cold weather protection of concrete, expansion and crack control joints. This item also includes demolition of existing concrete bus shelter pad, demolition to provide a neat, uniform tie-in, and shoulder restoration.
- 4.14. Standard Commercial Entrance (City Standard) - Shall be paid for per each, complete in place. The unit price shall include all labor and materials required for excavation; backfill and compaction of VDOT 21A Aggregate; forming using

steel forms in good condition (including face form); placement, finishing, curing, and hot/cold weather protection of **high-early** concrete, length of gutter, expansion and crack control joints; neat saw-cutting of existing pavement and concrete and asphalt restoration in front of the entrance. This item also includes demolition of existing concrete, demolition to provide a neat, uniform tie-in, demolition of existing pavements, restoration of existing driveways to provide a smooth transition to existing grades and shoulder restoration. Minimum slab thickness shall be 7 inches. Entrance cost shall also include gutter pan construction as required to connect to curb and gutter systems and shall include sidewalks through the entrance.

- 4.15. Standard Residential Entrance (City Standard) - Shall be paid for per each, complete in place. The unit price shall include all labor and materials required for excavation; backfill and compaction of VDOT 21A aggregate; forming using steel forms in good condition (including face form); placement, finishing, curing, and hot/cold weather protection of **high-early** concrete, length of gutter, expansion and crack control joints; neat saw-cutting of existing pavement and concrete, and asphalt restoration in front of the entrance. This item also includes demolition of existing concrete, demolition to provide a neat, uniform tie-in, demolition of existing pavements, restoration of existing driveways to provide a smooth transition to existing grades and shoulder restoration. Minimum slab thickness shall be 7 inches. Entrance cost shall also include gutter pan construction as required to connect to curb and gutter systems and shall include sidewalks through the entrance.
- 4.16. Concrete Channel - Shall be paid for per linear feet, complete in place. The unit price shall include all labor and materials required for excavation; backfill and compaction of VDOT 21A Aggregate (minimum 4 inches final lift thickness); forming using steel forms in good condition; welded wire fabric reinforcement; placement, finishing, curing, and hot/cold weather protection of concrete; expansion and crack control joints; This item also includes clearing and grubbing and shoulder restoration. Minimum slab thickness shall be 4 inches.
- 4.17. Trench Drain – Shall be measured and paid for per linear foot, complete in place. The unit price shall include all labor and materials required for excavation; backfill and compactions of VDOT 21A aggregate, forming using steel forms in good condition; welded wire fabric reinforcement, placement, finishing, curing, and hot/cold weather protection of concrete, expansion and crack control joints. This item also includes demolition of existing pavements and shoulder restoration.
- 4.18. Underdrain – Shall be paid on a linear foot basis. Underdrain shall be measured in linear foot along the centerline of the pipe for the size and type of pipe specified from end of pipe to end of pipe. The unit cost shall include the cost of furnishing, trenching, and installation of the pipe along with bedding material

and backfill material. The unit price shall also include installation of traffic-rated clean-outs, filter fabric, and VDOT EW-12 endwalls.

- 4.19. Erosion & Sediment Control Measures – Shall be measured and paid for on a lump sum basis. The lump sum price shall include all items related to erosion and sediment control including, but not limited to, silt fence, tree protection, construction entrances and permanent seeding. Pay requests may be made for this item based on the percentage of completion.
- 4.20. Unsuitable Materials – Shall be measured and paid for on a cubic yard basis. The unit price shall include excavation, separation of different solid wastes into containers, disposal of all solid wastes and unsuitable soils at an approved off-site facility. This price shall also include labor and materials to backfill and compact the excavation with suitable soils. This price shall also include all coordination necessary to comply with the project's Waste Management Plan.
- 4.21. Pavement Markings – Shall be paid for on a lump sum basis. The lump sum price shall include the new crosswalks on 5th Street and on Liberty Road, the new striping within the Lincoln Terrace Elementary School parking lot, and the removal of all old crosswalks and striping as shown on the plans. Pavement markings shall be thermoplastic. Pay requests may be made for this item based on the percentage of completion.
- 4.22. Geogrid Material – Shall be measured and paid for on a square yard basis. Where poor subgrade is encountered, the owner's representative may require the installation of a geogrid material in lieu of remedial excavation. The square yard price shall include labor and materials to install the geogrid over subgrade.
- 4.23. Chain Link Fence – Shall be measured and paid for on a linear foot basis, complete in place. This price shall include removal of the existing wire fence, labor and materials.

End of Section

**SECTION 01310
PROJECT MEETINGS**

PART 1 GENERAL

1.1 PRECONSTRUCTION CONFERENCE

- A. Before start of construction, Contracting Officer will arrange an on-site meeting with Contractor. The meeting agenda will include the following as a minimum:
 - 1. Correspondence procedures
 - 2. Designation of responsible personnel
 - 3. Labor standards provisions
 - 4. Payroll reports
 - 5. Changes
 - 6. Payments to Contractor
 - 7. Subcontractors
 - 8. Accident prevention program (including name of responsible supervisor)
 - 9. Accident reporting
 - 10. Documents required under the contract
 - 11. Recycling Program
 - 12. Saturday, Sunday, holiday and night work
 - 13. Erosion & Sediment Control requirements for off-site borrow or waste pits
 - 14. Tentative construction schedule
 - 15. Submittal of shop drawings, project data, samples, and approved equals
 - 16. Project closeout requirements

1.2 PROGRESS MEETINGS

- A. The Contracting Officer will schedule meetings with the Contractor and subcontractors once per month and timed with Application for Payment.
- B. Additional meetings will be held upon request or as directed by the Contracting Officer.
- C. The meeting agenda will include the following as a minimum:
 - 1. Approval of minutes of previous meetings
 - 2. Review of work progress
 - 3. Field observations, problems, and decisions
 - 4. Identification of problems which impede planned progress
 - 5. Review of submittals schedule and status of submittals
 - 6. Review of off-site fabrication and delivery schedules
 - 7. Status of project record drawings (monthly)
 - 8. Maintenance of progress schedule
 - 9. Corrective measures to regain projected schedules
 - 10. Planned progress during succeeding work period
 - 11. Coordination of projected progress
 - 12. Maintenance of quality and work standards
 - 13. Effect of proposed changes on progress schedule and coordination
 - 14. Other business relating to work

PART 2 PRODUCTS NOT USED.

PART 3 EXECUTION NOT USED.

PART 4 MEASUREMENT AND PAYMENT

4.1 PROJECT MEETINGS

- A. Payment will be included in the bid item to which this work relates.

END OF SECTION

Section 01350

Submittals

1. General

- 1.1. Submittals shall include all anticipated shop drawings, product data, and samples as defined in the Contract Documents and also include certificates, test data, and other submitted data required to demonstrate compliance with the contract documents. See General Conditions Section 14 for more information.
- 1.2. Any project using VDOT enhancement funds or FWHA funds shall require an affidavit from the following "Source of Material" Suppliers:
 - 1.2.1. Concrete mix products
 - 1.2.2. Precast concrete products (including segmental retaining walls)
 - 1.2.3. Wood or timber products
 - 1.2.4. Asphalt products
 - 1.2.5. Steel products
 - 1.2.6. Aggregate Base products
- 1.3. Submittal Register – Provide 3 Copies of Each Submittal (See blank form in Appendix B for cover transmittal)

Submittal Number	Description
1	**Schedule
2	**Traffic Control Plan(s)
3	**Federal Labor Standards – Form 2010 (See Appendix D)
4	**Federal Labor Standards - Section 3 Strategy (See Appendix D)
5	**Federal Labor Standards - Contractor's Certification Concerning Labor Standards and Prevailing Wage Requirements (Form GC-A) (See Appendix D)
6	**Federal Labor Standards - Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements (Form GC-B) (See Appendix D)
7	Compaction Tests (Multiple submittals as project progresses)
8	Backfill Proctor Data (ASTM D698)
9	Soil Classifications (Multiple submittals as project progresses)
10	Concrete Mix Designs (Multiple submittals as project progresses)
11	Concrete - High early admixture
12	Rock Removal Blaster's Certificates and Qualification Data (If blasting is required)
13	Rock Removal Blaster Procedure (If blasting is required)

Submittals

14	Topsoil analysis
15	Soil classification for backfill material (not required for shoulder restoration for curbs and sidewalks)
16	Seeding Mix
17	CBR - Road Subgrade Test
18	Landscaping - Installer Qualification Data
19	Landscaping – Planting Schedule
20	Landscaping - Material test reports for surface soil and imported topsoil
21	Trench drain Product Data Sheet
22	Underdrain pipe Product Data Sheet
23	Pavement markings Product Data Sheet
24	Geogrid Product Data Sheet
25	Chain link fence Product Data Sheet

** - Must be submitted and approved before notice to proceed date is set.

1.4. Resubmission - Change or correct submittals as required by the Chapter's project manager or Chapter's consultant.

1.5. Review Procedures - Submittals will be reviewed with reasonable promptness.

Submittals will be stamped with one of the five following actions:

1.5.1. "Approved" indicates approval with no exception taken and the plan of work shown may proceed. However, the approval of any submittal shall not relieve the Contractor from the responsibility of complying with all requirements of this Contract, including the obligation to provide submittals that are accurate and complete. The Chapter assumes no responsibility for figured dimensions on shop drawings. In addition, the Chapter assumes no responsibility for concrete compression strength tests even after the mix design has been approved.

1.5.2. "Approved as Noted" indicates approval subject to the noted corrections. Ordering or fabrication of work shown may proceed on the basis of corrections indicated.

1.5.3. "Correct and Resubmit" indicates that additional information or changes (as noted) are required prior to taking further action. Corrections shall be made to the submittal and it shall be resubmitted. Ordering or fabrication of work shall not proceed.

1.5.4. "Disapproved" indicates information provided reveals that submittal does not conform to the contract requirements. Submittal conforming to the contract requirements shall be submitted for approval.

Submittals

1.5.5. “No Action Taken” indicates one of the following: Submittal incomplete and a proper review cannot be performed, Insufficient copies submitted, Transmittal form incomplete, Contractor’s certificate approving submittal not signed or missing, Submittal not required and the contract documents do not require the Chapter to take action on this item, and Other causes or reasons as noted.

1.6 Colors – Not Used

- 1.7 **Changes After Approval** – Contractor shall not make any changes in submittal marked “Approved” or “Approved as Noted” without obtaining the prior written consent of the Chapter. If such written consent is obtained, revise the submittal to show fully the altered parts of the work and resubmit according to the procedures specified herein. State on resubmitted plans that the work shown supersedes and voids identified parts of the same work previously shown. Give full identification on the drawings previously approved by the Chapter and the date of such action.
- 1.8 **Proceeding without Approval** - Proceeding with any construction and ordering or fabricating materials before all relevant drawings have been “Approved” or “Approved as Noted” shall be done at the Contractor’s sole risk.

End of Section

SECTION 01400
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
 - 3. Divisions 2 through 16 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- D. Laboratory Mockups: Full-size, physical assemblies that are constructed at a testing facility to verify performance characteristics.
- E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Names of individuals making tests and inspections.
 5. Description of the Work and test and inspection method.
 6. Identification of product and Specification Section.
 7. Complete test or inspection data.
 8. Test and inspection results and an interpretation of test results.
 9. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- D. **Fabricator Qualifications:** A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. **Testing Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. **Factory-Authorized Service Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.7 QUALITY CONTROL

- A. **Owner Responsibilities:** Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."
- D. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.
2. Any and all work found to be non-compliant with quality requirements shall be corrected at Contractor's expense, regardless of time of discovery.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and re-inspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
 2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01420
REFERENCE STANDARDS

PART 1 GENERAL

1.1 The following abbreviations, which may be used in the construction specifications, refer to the organizations and specifications of the organizations listed below:

AA	Aluminum Association 900 19th Street, NW, Suite 300 Washington, D.C. 20006-2168
AABC	Associated Air Balance Council 1518 K Street, NW, Suite 503 Washington, D.C. 20005
AAMA	American Architectural Manufacturers Association 1827 Walden Office Square, Suite 104 Schaumberg, Illinois 60173
AAN	American Association of Nurserymen 1250 I Street, NW, Suite 500 Washington, D.C. 20005
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, NW, Suite 249 Washington, D.C. 20001
ABMA	American Boiler Manufacturers Association 950 N. Glebe Road, Suite 160 Arlington, Virginia 22203-1824
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, Michigan 48333
ACPA	American Concrete Pipe Association 222 West Colinas Boulevard, Suite 641 Irving, Texas 75039-5423
ADC	Air Diffusion Council 11 South LaSalle Street, Suite 1400 Chicago, Illinois 60603
AFPA	American Forest and Paper Association 1111 19th Street, NW, Suite 800 Washington, D.C. 20036

AGA	American Gas Association 1515 Wilson Boulevard Arlington, Virginia 22209
AHA	American Hardboard Association 1210 W. Northwest Highway Palatine, Illinois 60067-1897
AHAM	Association of Home Appliance Manufacturers 20 N. Wacker Drive, Suite 1500 Chicago, Illinois 60606
AI	Asphalt Institute Research Park Drive P.O. Box 14052 Lexington, Kentucky 40512-4052
AISC	American Institute of Steel Construction, Inc. 1 East Wacker Drive, Suite 3100 Chicago, Illinois 60601-2001
AISI	American Iron and Steel Institute 1101 17th Street, NW, Suite 1300 Washington, D.C. 20036-4700
AITC	American Institute of Timber Construction 7012 S. Revere Parkway, Suite 140 Englewood, Colorado 80112
ALSC	American Lumber Standards Committee P.O. Box 210 Germantown, Maryland 20875
AMCA	Air Movement and Control Association 30 W. University Drive Arlington Heights, Illinois 60004-1893
ANSI	American National Standards Institute 11 West 42nd Street, 13th Floor New York, New York 10036
APA	American Plywood Association (See EWA)
APWA	American Public Works Association 106 West 11th Street, Suite 1800 Kansas City, Missouri 64105-1806
ARI	Air-Conditioning and Refrigeration Institute 4301 Fairfax Drive, Suite 425 Arlington, Virginia 22203

ARM	Asphalt Roofing Manufacturers Association 6001 Executive Boulevard, Suite 201 Rockville, Maryland 20852
ASC	Adhesive and Sealant Council 1627 K Street, NW, Suite 1000 Washington, D.C. 20006-1707
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, Georgia 30329-2305
ASLA	American Society of Landscape Architects 4401 Connecticut Avenue, NW Fifth Floor Washington, D.C. 20008-2302
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, New York 10017
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Boulevard, Suite 210 Westlake, California 91362-3649
ASSE	American Society of Sanitary Engineering 28901 Clemens Road, Suite 100 Westlake, Ohio 44145
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, Pennsylvania 19428-2959
AWI	Architectural Woodwork Institute 1952 Isaac Newton Square Reston, Virginia 20190
AWPA	American Wood-Preservers' Association P.O. Box 286 Woodstock, Maryland 21163-0286
AWPI	American Wood Preservers Institute 1945 Old Gallows Road, Suite 550 Vienna, Virginia 22182
AWS	American Welding Society, Inc. 550 NW LeJeune Road Miami, Florida 33126

AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, Colorado 80235
BHMA	Builders Hardware Manufacturers Association, Inc. 355 Lexington Avenue, 17th Floor New York, New York 10017
BIA	Brick Institute of America 11490 Commerce Park Drive, Suite 300 Reston, Virginia 22091-1506
BOCA	Building Officials Code Administrators 4051 W. Flossmoor Road Country Club Hills, Illinois 60478-5795
CBM	Certified Ballast Manufacturers 1422 Euclid Avenue, Suite 402 Cleveland, Ohio 44115-2851
CDA	Copper Development Association, Inc. 260 Madison Avenue, 16th Floor New York, New York 10016-2401
COE	Corps of Engineers (Chief of Engineers - Referral, U.S. Department of the Army) Washington, D.C. 20314
CID	Commercial Item Description See General Provisions
CISPI	Cast Iron Soil Pipe Institute 5959 Shallowford Road, Suite 419 Chattanooga, Tennessee 37421
CLFMI	Chain Link Fence Manufacturers Institute 9891 Broken Land Parkway, Suite 300 Columbia, Maryland 21046
CRA	California Redwood Association 405 Enfrente Drive, Suite 200 Novato, California 94949
CRI	Carpet and Rug Institute Box 2048 Dalton, Georgia 30722-2048
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, Illinois 60173-4758

CSSB	Cedar Shingle and Shake Bureau 515 116th Avenue, Suite 275 Bellevue, Washington 98004-5294
DEQ	Department of Environmental Quality Southwest Regional Office 355 Deadmore Street P.O. Box 1688 Abingdon, VA 24212
DHI	Door and Hardware Institute 14170 Newbrook Drive Chantilly, Virginia 22021-2223
EPA	Environmental Protection Agency 401 M Street, SW Washington, D.C. 20460
EWA	Engineered Wood Association P.O. Box 11700 Tacoma, Washington 98411-0700
FHA	Federal Housing Administration (U.S. Department of Housing and Urban Development) 451 7th Street, SW Washington, D.C. 20201
FHVA	Fine Hardwood Veneer Association 260 S. First Street, Suite 2 Zionsville, Indiana 46077
FM	Factory Mutual Engineering Corporation 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, Massachusetts 02062
GA	Gypsum Association 810 First, NE, Suite 510 Washington, D.C. 20002
GANA	Glass Association of North America 3310 SW Harrison Street Topeka, Kansas 66611-2279
HI	Hydronics Institute 35 Russo Place P.O. Box 218 Berkeley Heights, New Jersey 07922

HMA	Hardwood Manufacturers Association (Formerly Southern Hardwood Lumber Manufacturers Association) 400 Penn Center Boulevard, Suite 531 Pittsburgh, Pennsylvania 15235
HPMA	Hardwood Plywood Manufacturers Association P.O. Box 2789 Reston, Virginia 22090-2789
IA	Irrigation Association 1911 N. Fort Myer Drive, Suite 1009 Arlington, Virginia 22209-1630
ICBO	International Conference of Building Officials 5360 S. Workman Mill Road Whittier, California 90601
ICEA	Insulated Cable Engineers Association, Inc. P.O. Box 440 South Yarmouth, Massachusetts 02664
IEEE	The Institute of Electrical and Electronics Engineers 345 E. 47th Street New York, New York 10017-2394
IES	Illuminating Engineering Society of North America 120 Wall Street, Fl 17 New York, New York 10005-4001
IGCC	Insulating Glass Certification Council 3393 Route 11, Industrial Park P.O. Box 2040 Cortland, New York 13045-0950
ILIA	Indiana Limestone Institute of America, Inc. Suite 400, Stone City Bank Building Bedford, Indiana 47421
KCMA	Kitchen Cabinet Manufacturers Association 1899 Preston White Drive Reston, Virginia 22091-4326
LIA	Lead Industries Association, Inc. 295 Madison Avenue, 19th Floor New York, New York 10017
MBMA	Metal Building Manufacturers Association 1300 Sumner Avenue Cleveland, Ohio 44115-2851

MFMA	Maple Flooring Manufacturers Association 60 Revere Drive, Suite 500 Northbrook, Illinois 60062
MIA	Marble Institute of America 30 Eden Alley, Suite 201 Columbus, Ohio 43215
MIMA	Mineral Insulation Manufacturers Association 1420 King Street Alexandria, Virginia 22314
MLSFA	Metal Lath/Steel Framing Association - A Division of NAAMM 8 South Michigan Avenue, Suite 1000 Chicago, Illinois 60603
MSHA	Mine Safety and Health Administration 4015 Wilson Boulevard, Room 601 Arlington, Virginia 22203
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park Street, NE Vienna, Virginia 22180
NAAMM	The National Association of Architectural Metal Manufacturers 8 South Michigan Avenue, Suite 1000 Chicago, Illinois 60603
NACE	National Association of Corrosion Engineers 1440 South Creek Drive P.O. Box 218340 Houston, Texas 77218-8340
NAIMA	North American Insulation Manufacturers Association 44 Canal Center Plaza, Suite 310 Alexandria, Virginia 22314
NAPA	National Asphalt Pavement Association NAPA Building 5100 Forbes Boulevard Lanham, Maryland 20706-4413
NAPCA	National Association of Pipe Coating Applicators 8th Floor, Commercial National Bank Building 333 Texas Street, Suite 800 Shreveport, Louisiana 71101-3673
NBS	National Bureau of Standards (U.S. Department of Commerce)(See NIST)

NCMA	National Concrete Masonry Association 2302 Horse Pen Road Herndon, Virginia 22071-3499
NEC	National Electrical Code (by NFPA)
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, Maryland 20814
NELM	Northeastern Lumber Manufacturers' Association 272 Tuttle Road P.O. Box 87A Cumberland Center, Maine 04021-0687
NEII	National Elevator Industry, Inc. 185 Bridge Plaza North, Suite 310 Fort Lee, New Jersey 07024
NEMA	National Electrical Manufacturers Association 2101 L Street, NW, Suite 300 Washington, D.C. 20037-1526
NFPA	National Fire Protection Association 1 Batterymarch Park P.O. Box 9101 Quincy, Massachusetts 02269-9101
NHLA	National Hardwood Lumber Association P.O. Box 34518 Memphis, Tennessee 38184-0518
NHPMA	Northern Hardwood and Pine Manufacturers Association, Inc., c/o Northern Softwood Lumber Bureau Box 217 Dear River, Minnesota 56636
NIOSH	National Institute for Occupational Safety and Health NIOSH Building 1, Room 3007 1600 Clifton Road, NE Atlanta, Georgia 30333

NIST	National Institute of Standards and Technology (US Department of Commerce) Administration Building, Room E128 Gaithersburg, Maryland 20899
Send requests for publications to: Superintendent of Documents Government Printing Office Washington, D.C. 20402	
NOFMA	National Oak Flooring Manufacturers Association P.O. Box 3009 Memphis, Tennessee 38173-0009
NPA	National Particleboard Association 18928 Premiere Court Gaithersburg, Maryland 20879-1569
NRCA	National Roofing Contractors Association O'Hare International Center 10255 W. Higgins Road, Suite 600 Rosemont, Illinois 60018-5607
NSF	National Sanitation Foundation 3475 Plymouth Road P.O. Box 130140 Ann Arbor, Michigan 48113-0140
NTMA	The National Terrazzo and Mosaic Association 3166 Des Plaines Avenue, Suite 132 Des Plaines, Illinois 60018
NWWDA	National Wood Window and Door Association 1400 East Touhy Avenue, Suite 470 Des Plaines, Illinois 60018
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) Government Printing Office Washington, D.C. 20402
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, Illinois 60077-1083

PCI	Precast/Prestressed Concrete Institute 175 W. Jackson Boulevard Chicago, Illinois 60604
PDI	Plumbing and Drainage Institute 45 Briston Drive, Suite 101 South Euston, Massachusetts 02375
PEI	Porcelain Enamel Institute, Inc. 4004 Hillsboro Pike, Suite 224-B Nashville, Tennessee 37215
PI	Perlite Institute, Inc. 88 New Dorp Plaza Staten Island, New York 10306
PS	Product Standard of NBS (U.S. Department of Commerce) Government Printing Office Washington, D.C. 20402
RFCI	Resilient Floor Covering Institute 966 Hungerford Drive, Suite 12-B Rockville, Maryland 20850
RIS	Redwood Inspection Service (Grading Rules) 405 Enfrente Drive, Suite 200 Novato, California 94949
RMMI	Rocky Mountain Masonry Institute 1780 South Bellaire Street, No. 602 Denver, Colorado 80222
SCMA	Southern Cypress Manufacturers Association 400 Penn Center Blvd., Suite 530 Pittsburgh, Pennsylvania 15235
SDI	Steel Deck Institute P.O. Box 9506 Canton, Ohio 44711
SDI	Steel Door Institute 30200 Detroit Road Cleveland, Ohio 44145-1967
SFPA	Southern Forest Products Association P.O. Box 52468 New Orleans, Louisiana 70152

SGCC	Safety Glazing Certification Council ETL Testing Labs, Inc., Industrial Park 3933 U.S. Route 11 P.O. Box 2040 Cortland, New York 13045-0950
SIGMA	Sealed Insulating Glass Manufacturers Association 401 N. Michigan Avenue Chicago, Illinois 60611
SJI	Steel Joist Institute 3127 10th Avenue, North Ext. Myrtle Beach, South Carolina 29577-6760
SMACNA	Sheet Metal and Air-Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, Virginia 22021
SPIB	Southern Pine Inspection Bureau (Grading Rules) 4709 Scenic Highway Pensacola, Florida 32504-9094
SSPC	Steel Structures Painting Council 40 24th Street, 6th Floor Pittsburgh, Pennsylvania 15222-4643
SWI	Steel Window Institute c/o Thomas Associates, Inc. 1300 Sumner Avenue Cleveland, Ohio 44115-2851
TCA	Tile Council of America 100 Clemson Research Boulevard Anderson, South Carolina 29625
TIMA	Thermal Insulation Manufacturers Association (See NAIMA)
TPI	Truss Plate Institute 583 D'Onofrio Drive, Suite 200 Madison, Wisconsin 53719
UBC	Uniform Building Code (by ICBO)
UL	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, Illinois 60062
USDA	U.S. Department of Agriculture Independence Avenue, between 12th and 14th Streets, SW Washington, D.C. 20250

WCLB West Coast Lumber Inspection Bureau (Grading Rules)
 P.O. Box 23145
 Portland, Oregon 97281

WIC Woodwork Institute of California
 P.O. Box 980247
 3164 Industrial Boulevard
 West Sacramento, California 95798-0247

WMMPA Wood Moulding and Millwork Producers Association
 P.O. Box 25278
 Portland, Oregon 97225-0278

WRI Wire Reinforcement Institute, Inc.
 203 Loudoun Street, SW
 Leesburg, Virginia 22075

WSFI Wood and Synthetic Flooring Institute (See MFMA)

WWPA Western Wood Products Association (Grading Rules)
 Yeon Building
 522 S.W. 5th Avenue
 Portland, Oregon 97204-2122

WWPA Woven Wire Products Association
 2515 Nordica Avenue
 Chicago, Illinois 60635

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION: NOT USED

PART 4 MEASUREMENT AND PAYMENT: NOT USED

END OF SECTION

Section 01500

Temporary Facilities

- 1.1. Section includes temporary utilities, temporary sanitary facilities, staging and storage, protection of installed work, job site office, and protection of property, employees, and general public.
- 1.2. Related Sections – Not Used
- 1.3. References – Not Used
- 1.4. Quality Assurance – Not Used
- 1.5. Submittals – Not Used.
- 1.6. Use Charges: Contractor is responsible for any cost or usage charges for temporary services or facilities. Cost or use charges for temporary services or facilities or for operation of permanent utilities shall not be accepted as a basis of claims for an increase in the contract sum.
- 1.7. Use of Existing Facilities – Contractor shall not use City existing buildings/parking garages for storage, vertical transportation, toilets, or other construction requirements.
- 1.8. Temporary Electricity and Lighting -Contractor shall arrange for power and lighting and pay costs for service and power used.
- 1.9. Temporary Water - Contractor shall arrange for water for construction purposes and pay costs for installation, maintenance and removal, and service charges for water used.
- 1.10. Temporary Sanitary Facilities - Contractor shall arrange and pay for toilet facilities and maintain those facilities in accordance with the public health authority having jurisdiction.
- 1.11. Staging and Storage Areas - Contractor shall arrange and pay any associated costs for stage and storage areas.
 - 1.11.1. Use of the street or right of way for staging or storage shall be coordinated with the City of Roanoke Transportation Department. The City of Roanoke Engineering Department shall not coordinate such effort.
 - 1.11.2. Contractor shall provide approved construction fencing for protection of the public as a part of the work as required.

1.12. Protection of Installed Work - Contractor shall provide temporary and removable protection for installed products as required. Contractor shall prohibit traffic from landscaped areas.

1.13. Protection of Property, Employees, and General Public

1.13.1. Contractor shall provide fences, planking, bridges, bracing, sheeting, shoring, lights, barricades, and warning signs as necessary to protect the property, adjacent property, employees, and general public, and comply with applicable federal, state, and local regulations as required.

1.13.2. Trees, Vegetation, and Pavement: Protect from damage existing lawns, trees, and shrubs to remain and existing fences, roads, walks, and curbs not indicated to be removed. Repair or replace damage caused by operations under this contract.

1.14. Removal

1.14.1. Completely remove temporary facilities when their use is no longer required. Repair and clean areas damaged by temporary installations.

1.14.2. Restore permanent facilities used for temporary services to their original condition.

1.15. Job site office - The contractor shall not be required to have a job site office or trailer.

2. Products

2.1. Safety Fence as manufactured by Harris Industries, Inc, 5181 Argosy Avenue, Huntington Beach, CA 92649 (Telephone 800-222-6866) or approved equal.

2.1.1. High Density Polyethylene with mesh size. Finish: Bright Orange.

3. Execution

3.1. Safety Fence – Installed as shown on plans and in accordance with manufacturer's recommendations.

End of Section

**SECTION 01520
FIELD OFFICES AND SHEDS**

PART 1 GENERAL

1.1 DESCRIPTION

- A. The requirements of this section consist of furnishing, locating, and removing temporary structures, equipment, and furnishings.

1.2 RELATED REQUIREMENTS

- A. Temporary services - Section 01510.

PART 2 PRODUCTS

2.1 CONTRACTOR'S FIELD OFFICE

- A. Contractor shall provide an office for Progress Meetings and for his own use. Size, location, and construction shall be subject to approval, but at a minimum be sized to conduct monthly Progress Meetings.

2.2 STORAGE SHEDS

- A. Provide temporary weathertight sheds or other covered facilities for storage of materials subject to weather damage. Number and size of structures shall be subject to Contracting Officer's approval.

PART 3 EXECUTION

3.1 OTHER STRUCTURES

- A. Locate where approved by Contracting Officer, a minimum of 50 feet from permanent structures.

3.2 REMOVAL

- A. Remove structures, equipment, and furnishings, and terminate services after punch list is 100 percent completed or when directed by Contracting Officer.

PART 4 MEASUREMENT AND PAYMENT

4.1 FIELD OFFICES AND SHEDS

- A. Payment will be included in the bid item to which this work relates.

END OF SECTION

SECTION 01560 BARRIERS

PART 1 GENERAL

1.1 DESCRIPTION

- A. The work of this section consists of furnishing, installing, and maintaining barriers to protect existing facilities and the public from construction operations.

1.2 REGULATORY REQUIREMENTS

- A. Conform to all applicable codes including those of VDOT.
- B. Obtain and pay for all required permits for work within VDOT right-of-way.
- C. Traffic Control (Hwy. 58):
 - 1. Contractor shall design, submit and satisfy all VDOT requirements for traffic control and safety plans required within VDOT right-of-way. Contractor shall be responsible for providing, maintaining and implementing all required traffic control devices required.
 - 2. Traffic control shall be coordinated and required at a minimum under the following circumstances:
 - a. Work within or adjacent to edges of existing pavement.
 - b. Utility boring operations.
 - c. Construction equipment entering roadway.
 - d. Offsite haul operations.
 - e. Pavement marking operations.

PART 2 PRODUCTS

2.1 GENERAL

- A. Material may be new or used, but shall be suitable for intended purpose. Fences and barriers shall be structurally adequate and neat in appearance.

2.2 FENCING

- A. Safety Barrier Fence: Orange plastic fence, minimum height, 4 feet.

2.3 BARRICADES AND SIGNS

- A. Virginia Work Area Protection Manual Standards and Guidelines for Temporary Traffic Control, Appendix A, latest edition.

2.4 LUMBER

- A. Free of nails, large knot holes and splinters.

2 .5 BARRIER TAPE

- A. Banner Guard, imprinted with "CAUTION: CONSTRUCTION AREA", manufactured by Reef Industries, Inc., Houston, Texas, or approved equal.

PART 3 EXECUTION

3 .1 PROTECTION OF PUBLIC

- A. Fence, barricade, or otherwise block off the immediate work area to prevent unauthorized entry.
- B. Erect and maintain barricades, lights, danger signals, and warning signs in accordance with MUTCD-latest edition.
- C. Illuminate barricades and obstructions at night; keep safety lights burning from sunset to sunrise.
- D. Adequately barricade and post open cuts in or adjacent to thoroughfares.
- E. Protect pedestrian traffic by guardrails or fences.
- F. Cover pipes, hoses, and power lines crossing sidewalks and walkways with troughs using beveled edge boards.
- G. Erect and maintain sufficient detour signs at road closures and along detour routes.

3 .2 BARRIER TAPE

- A. Install where directed by Contracting Officer. Keep a minimum of two rolls on site at all times.

3 .3 REMOVAL

- A. Completely remove barriers no longer needed when approved by Contracting Officer.

PART 4 MEASUREMENT AND PAYMENT

4 .1 BARRIERS

- A. Payment will be included in the bid item to which this work relates.

END OF SECTION

**SECTION 01600
MATERIAL AND EQUIPMENT**

PART 1 GENERAL

1 .1 DESCRIPTION

- A. The work of this section consists of the general procedures for handling, storing, and protecting material and equipment.

1 .2 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of materials in accordance with construction schedules; coordinate to avoid conflict with work and conditions at the site. Deliver materials in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible. Contractor is encouraged to obtain materials in biodegradable or recyclable/reusable packaging which uses the minimum amount of packaging possible.

1 .3 STORAGE AND PROTECTION

- A. Store materials in accordance with manufacturer's instructions, with seals and labels accessible for inspection.
- B. Interior Storage: Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- C. Exterior Storage:
 1. Store products subject to damage by the elements in weathertight enclosures.
 2. Store fabricated products above the ground, on blocking or skids; prevent soiling or staining. Cover products subject to damage or deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
 3. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- D. Protection After Installation: Provide adequate coverings as necessary to protect installed materials from damage resulting from natural elements, traffic, and subsequent construction. Remove when no longer needed.

PART 2 PRODUCTS NOT USED.

PART 3 EXECUTION NOT USED.

PART 4 MEASUREMENT AND PAYMENT

4 .1 MATERIAL AND EQUIPMENT

- A. Payment will be included in the bid item to which this work relates.

END OF SECTION

**SECTION 01770
PROJECT CLOSEOUT**

PART 1 GENERAL

1.1 DESCRIPTION

- A. The work of this section consists of final cleanup, closeout submittals, and final inspection procedures.

PART 2 PRODUCTS

2.1 CLEANING MATERIALS

- A. As recommended by the manufacturer of surface to be cleaned.

2.2 POSTED OPERATING INSTRUCTIONS

- A. Frame instructions under nonglare glass or approved laminated plastic. In areas where operating instructions are subject to sunlight or moisture, provide weather-resisting materials.

PART 3 EXECUTION

3.1 POSTED OPERATING INSTRUCTIONS

- A. As specified in the individual sections. Furnish operating instructions attached to or posted adjacent to equipment. Include wiring diagrams, control diagrams, control sequence, start-up, adjustment, operation, lubrication, shut-down, safety precautions, procedures in the event of equipment failure, and other items of instruction recommended by the manufacturer.

3.2 CLEANING

- A. Before scheduling the final inspection, remove all tools, equipment, surplus materials, and rubbish. Restore or refinish surfaces that are damaged due to work of this contract to original condition. Remove grease, dirt, stains, foreign materials, and labels from finished surfaces. Thoroughly clean building interiors. Pick up all construction debris from the site. At time of final inspection, project shall be thoroughly clean and ready for use.

3.3 PROJECT RECORD DRAWINGS

- A. Maintain one complete full-size set of contract drawings and one full-size set of vendor-supplied drawings. Clearly mark changes, deletions, and additions to show actual construction conditions. Show additions in red, deletions in green, and special instructions in blue.

- B. Keep record drawings current. Make record drawings available to the Contracting Officer for inspection at the time of monthly progress payment requests. If project record drawings are not current, the Contracting Officer may retain an appropriate amount of the progress payment.
- C. On completion of the total project, submit complete record drawings. Include all shop drawings, sketches, and additional drawings that are to be included in the final set, with clear instructions showing the location of these drawings.

3 .4 CLOSEOUT SUBMITTALS

- A. Submit before final inspection request.
 - 1. Project Record Drawings: As specified above.
 - 2. Guarantees and Bonds: As specified in individual sections.
 - 3. Spare Parts and Materials: As specified in individual sections.
 - 4. Operation and Maintenance Data: As specified in individual sections and Division 01.
 - 5. Keys and Keying Schedule: Submit all keys including duplicates. Wire all keys for each lock securely together. Tag and plainly mark with lock number, equipment identification, or panel or switch number, and indicate location, such as building and room name or number.
 - 6. Operating Tools: As specified in the individual sections.
 - 7. Special Tools: One set of special tools required to operate, adjust, dismantle, or repair equipment. Special tools are those not normally found in possession of mechanics or maintenance personnel.
 - 8. System Demonstration and Training: As specified in individual sections and Division 01.

3 .5 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

- A. Submit written certification that project, or designated portion of project, is substantially complete, and request in writing a final inspection. Contracting Officer will make an inspection within 21 days of receipt of request.
 - 1. When work is determined to be substantially complete, Contracting Officer will prepare a list of deficiencies to be corrected before final acceptance and issue a Letter of Substantial Completion. Contractor shall complete the work described on the list of deficiencies within 60 calendar days, as weather permits. If the Contractor fails to complete the work within this time frame, the Contracting Officer may replace, repair, or remedy the work with an appropriate reduction in the contract price.
 - 2. If work is not determined to be substantially complete, Contracting Officer will notify Contractor in writing. After completing work, Contractor shall resubmit certification and request a new final inspection.

3 .6 ACCEPTANCE OF THE WORK

- A. After all deficiencies have been corrected, a Letter of Acceptance will be issued.

PART 4 MEASUREMENT AND PAYMENT

4.1 PROJECT CLOSEOUT

- A. Payment will be included in the bid item to which this work relates.**

END OF SECTION

**SECTION 01785
OPERATION AND MAINTENANCE DATA**

PART 1 GENERAL

1.1 DESCRIPTION

- A. The work of this section consists of furnishing operation and maintenance data manuals.

1.2 RELATED WORK

- A. Project Record Drawings - Section 01770.

1.3 SCHEDULING

- A. At start of project, begin accumulating operation and maintenance data and initiate an index. Install and index all data in binders within 30 days after delivery of items. As custom written data and test results are produced, add them to the operation and maintenance data file.
- B. Keep operation and maintenance data current. Make operation and maintenance binders available to the Contracting Officer for inspection at the time of monthly progress payment requests. If operation and maintenance binders are not current the Contracting Officer may retain an appropriate amount of the progress payment.
- C. Before scheduling a final inspection, furnish two complete sets of operation and maintenance data to Contracting Officer for review. Should Contracting Officer find manual to be substantially incomplete, the final inspection will be delayed.
- D. Within 30 days following receipt of review comments, deliver two completed sets of Operation and Maintenance data.

PART 2 PRODUCTS

2.1 BINDERS

- A. White, commercial quality, hard back, three-ring, 2-inch maximum ring size, lever-locking type slant ring, with clear window pockets on front and side.

2.2 INDEX SYSTEM

- A. Index sheet and tabbed divider sheets and numbered tabs aligned with numbers and title lines on index sheet.

PART 3 EXECUTION

3 .1 FORM

- A. Provide two complete sets of data.
- B. Number multiple binder volumes consecutively.
- C. Cover Sheet: Identify the project title, location, contract number, prime contractor's name and address, date of substantial completion, and binder volume number. Insert cover sheet into clear plastic view pocket on front of binder. Insert sheet with project title and "Operation and Maintenance" into side clear plastic view pocket.
- D. Index System: Organize data into sections by common subjects and subsystems. Place a consecutively numbered tabbed divider sheet in front of each section. Place index sheet at the beginning of each binder, listing sections by subject name. If multiple binders are used, place a table of contents of all data provided behind the index sheet in each binder.
- E. Data: Fill binders to no more than 75 percent of capacity. Punch holes shall not obscure any data. Normal sheet size shall be 8-1/2 inches by 11 inches. Fold oversize sheets and insert them in 8-1/2 by 11-inch clear pocket sheet protectors placed in binders. When the contents of a single tabbed section covers more than one item, provide colored paper sheets to separate the data for each item.
 1. Manufacturers' Data: Provide originals for color or copyrighted data. Black and white data may be originals or clean, good quality reproductions. Where originals are printed on both sides of the page, reproductions shall also be printed on both sides of the page. Copies produced by facsimile transmission and sheets with stamps, such as submittal approval stamps, will not be acceptable. Include only sheets that apply to items installed; cross out inapplicable data.
 2. Vendor Furnished As-Built Drawings: Maximum 24-inch by 36-inch sheets with minimum character or lettering size of 1/8 inch. Reduced-size reproductions may be provided instead of full-size drawings if the reproductions are clear and legible. If reduced-size drawings are used, identify as "REDUCED SIZE" and provide graphic scales, if applicable.
 3. Custom Written Data: Typewritten text, supplemented by drawings and schematics necessary to describe systems adequately.
 4. Equipment Data Sheet: Typewritten data, using form at the end of this section.
 5. Schedules: Clean, typewritten schedules reflecting final, as-installed conditions. Hand-written mark-ups of schedules submitted earlier are not acceptable.
 6. Data that is poorly reproduced or in any way illegible will be rejected.

3 .2 CONTENT

- A. Manufacturers' Published Data: Provide all available data, including installation and operating instructions, parts lists, electrical and mechanical schematics, control circuit documentation, performance data, safety instructions, cleaning and care instructions, and illustrations and instructions for maintenance, including lubrication, disassembly and repair, cleaning, and service. Indicate catalog numbers, sizes, colors, options, and other information pertaining to the products furnished which would be required when ordering

replacements. For equipment assemblies, provide data for each separate item of equipment furnished as part of the assembly.

- B. Custom Written Data: For data not in manufacturer's standard literature, provide text, drawings, and schematics specifically applicable to installed systems. Include step-by-step descriptions of operating procedures; identification of individual components and their functions; descriptions of how system components relate to one another and operate together to accomplish a common process or function; and sequence of operation for system control circuits. For seasonally operated systems, provide start-up and shutdown instructions.
- C. Equipment Data Sheets: For each item of equipment included in the operation and maintenance data, provide an Equipment Data Sheet using the form at the end of this section. For equipment consisting of both a driven machine and a driver (for example, a pump and a motor), the equipment data shall cover both the driven machine and the driver. For similar type equipment (for example, multiple exhaust fans of the same model and type), provide a single equipment data sheet with an attached schedule listing the individual equipment items.
- D. Vendor Furnished As-Built Drawings: Provide for each electrical and each mechanical control system.
 - 1. For each control system, provide control circuit schematic drawings. Identify each wire and terminal block number. Show terminal numbers on all control devices. Show control wires and devices remote from the control panel.
 - 2. For each control panel, provide a general arrangement drawing showing location of each control component and terminal block on the panel front and interior. Include a materials list of all panel-mounted control components as well as field-installed control components remote from the panel, identifying components, manufacturer, model number, and initial set points or sensing ranges of devices where applicable.
 - 3. For packaged equipment systems, provide general arrangement drawings showing interrelationships of the various items of equipment and components.
 - 4. In addition to the control wiring schematic, provide a power wiring schematic drawing showing the power flow to each motor. Identify each power conductor. Show all overcurrent protection and motor starting devices.
- E. Schedules: Provide one copy of material and equipment schedules, as listed in the individual sections, in the appropriate sections of the manual.
- F. Warranties: Place a copy of each manufacturer, supplier, and installer warranty extending for a period greater than one year in a single separately identified tabbed section of the manual.
- G. Test Results: Include in the operation and maintenance data copies of test results for mechanical and electrical equipment and systems as listed in the individual specification sections.
- H. Subcontractor and Supplier List: List all subcontractors and major suppliers who worked on the project. Include each subcontractor's or supplier's address and telephone number and identify work performed.

PART 4 MEASUREMENT AND PAYMENT

4 .1 OPERATION AND MAINTENANCE DATA

- A. Payment will be included in the bid item to which this work relates.**

END OF SECTION

EQUIPMENT DATA SHEET

Equipment Item: _____ Designation: _____

Function: _____

Location: _____

Project: _____

Model No.: _____ Serial No.: _____

Manufacturer Address and Phone:

Supplier Address and Phone:

Preventive Maintenance Tasks:

✓

✓

✓

✓

Nameplate Data:

Spare Parts Furnished and Other Information:

SECTION 01815
SYSTEM DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.1 DESCRIPTION

- A. The work of this section consists of demonstrating systems and equipment to operating personnel. It also includes training of personnel.

1.2 COORDINATION

- A. Schedule demonstrations and training periods with Contracting Officer. Conduct training sessions after the equipment or system has been accepted and turned over to the Owner.

1.3 CLOSEOUT SUBMITTALS

- A. As specified in Section 01770.
- B. For each training session, the Contractor shall submit for approval a proposed outline of the subjects to be covered. The training shall not be conducted until the outline is approved.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.1 TRAINING

- A. As specified herein and in individual sections, furnish the services of instructors to train designated personnel in adjustment, operation, maintenance, and safety requirements of equipment and systems. Instructors shall be thoroughly trained in operating theory as well as practical operation and maintenance work for each type of equipment or system. The sequence of the training shall follow the approved training outline.
- B. Individual sections specify the duration of training required. If no duration is listed, provide training of sufficient duration to adequately cover the subjects. Repeat training where conditions change or are discovered to not be as intended.
- C. Use Operating and Maintenance Data as a training guide.
- D. System Start-up and Owner Instruction. At the completion of the work, the Contractor shall furnish, at no additional cost to the Owner, the services of a person completely familiar with all installations performed under Division 15, to instruct the Owner's operating personnel in the proper operation and servicing of all the HVAC/Plumbing equipment and systems. These services shall be available for a period of not less than one day.

PART 4 MEASUREMENT AND PAYMENT

4.1 SYSTEM DEMONSTRATION AND TRAINING

- A. Payment will be included in the bid item to which this work relates.**

END OF SECTION

Section 02231

Demolition

1. General

1.1. Section includes requirements for the demolition of

1.1.1. Not Used

1.1.2. Pavement or Milling of Pavement

1.1.3. Curb, Gutter, and Sidewalk

1.1.4. Buried Pipe and Associated Structure Removal / Abandonment of
Underground Utilities

1.2. Related Sections

1.2.1. Section 2230 – Clearing and Grubbing

1.2.2. Section 2315 – Fill and Backfill

1.2.3. Section 2370 – Erosion and Sediment Control

1.3. References – Not Used

1.4. Quality Assurance – Not Used

1.5. Submittals – Not Used

2. Products – Not Used

3. Execution

3.1. Preparation

3.1.1. Locate and identify all utilities. Care should be taken not to damage
utilities during demolition activities. Contractor shall always assume that all
utilities are active.

3.1.2. Contractor shall acquire a demolition permit from the City of Roanoke
Development Assistance Center (DAC) located at 215 Church Avenue for
the demolition of residential structures or commercial buildings.

3.2. Activities

3.2.1. Not Used

3.2.2. Pavement

3.2.2.1. Identify length and location of pavement to be demolished.

3.2.2.2. Excavate and remove pavement.

3.2.2.3. Contractor shall saw cut locations where curb, gutter, sidewalk and pavement are to remain in place.

3.2.2.4. Dispose of excavated pavement in accordance with local laws and regulations. Burying the demolition debris on site will not be allowed.

3.2.2.5. Backfill in accordance with Section 2315 – Fill and Backfill.

3.2.3. Milled Pavement

3.2.3.1. Asphalt pavement section to be milled shall to a minimum depth of 2”.

3.2.3.2. Contractor shall take care not to damage any remaining curb, curb inlets, manhole structures, valve boxes, etc.

3.2.3.3. Milled pavement must have a uniform surface and be free of debris.

3.2.3.4. Pavement overlay shall be properly tacked. See Section 02741.

3.2.3.5. Contractor shall maintain any existing road crowns or super elevations.

3.2.4. Curb, Gutter and Sidewalk

3.2.4.1. Identify length and location of curb, gutter, and sidewalk to be demolished.

3.2.4.2. Excavate and remove curb, gutter and sidewalk.

3.2.4.3. Contractor shall saw cut locations where curb, gutter, sidewalk and pavement are to remain in place.

3.2.4.4. Dispose of excavated concrete material in accordance with local laws and regulations. Burying the demolition debris on site will not be allowed.

3.2.4.5. Backfill in accordance with Section 2315 – Fill and Backfill.

3.2.5. Buried Pipe and Associated Structure Removal / Abandonment of Underground Utilities

3.2.5.1. Identify length and location of buried pipe to be demolition.

3.2.5.2. Excavate and remove all identified pipe and associated structures as shown on drawings.

3.2.5.3. Abandon underground utilities, which are indicated to remain in place, by filling pipes with flowable fill in accordance with Section 3200 – Flowable Fill as shown on drawings.

3.2.5.4. Dispose of all pipe and structures in accordance with local laws and regulations. Burying the demolition debris on site will not be allowed.

3.2.5.5. Backfill in accordance with Section 2315 – Fill and Backfill.

3.3. Regulatory and Safety Requirements

3.3.1. Contractor shall comply with federal, state, and local hauling and disposal regulations. In addition to other requirements, herein, safety requirements shall conform with ANSI A10.6.

3.4. Dust and Debris Control

3.4.1. Contractor shall prevent the spread of dust and debris on pavements and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Sweep pavements as often as necessary to control the spread of dust, mud and debris.

3.5. Protection of Project Site

3.5.1. Traffic Control Signs

3.5.1.1. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights.

3.5.2. Existing Work - Protect existing work which is to remain in place, be reused, or remain the property of the Owner. Repair items which are to remain and which are damaged during performance of the work to their original condition, or replace with new. Do not overload pavements to remain.

3.5.3. Trees - Protect existing vegetation to remain.

3.5.4. Facilities - Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.

3.5.5. Burning - Burning will not be permitted.

3.5.6. Relocations - Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair items to be relocated which are damaged or replace items with new undamaged items as approved by the City of Roanoke.

End of Section

Section 02300

Excavation

1. General

- 1.1. Section includes the excavating as necessary to establish finish grades or positive drainage as shown on the plans.
- 1.2. Related Sections – City of Roanoke Right of Way Excavation Standards, latest edition.
- 1.3. References – City of Roanoke Waste Management Plan for the Safe Routes to School Addison Middle School Project.
- 1.4. Quality Assurance – Not Used
- 1.5. Submittals – Not Used

2. Products – Not Used

3. Execution

3.1. Preparation

- 3.1.1. Locate and identify all utilities. Care should be taken not to damage utilities during trenching activities.
- 3.1.2. Identify required lines, levels, contours, and datum locations.
- 3.1.3. Verify that survey bench marks and intended elevations for the Work are as indicated.
- 3.1.4. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.2. Activities

- 3.2.1. Strip and stockpile topsoil from areas to be excavated. At a minimum, the first twelve (12) inches shall be stripped.
- 3.2.2. Contractor shall maintain positive drainage on the site at all times.
- 3.2.3. Notify project manager of any unexpected subsurface conditions.

- 3.2.4. Provide a method of dewatering, if necessary.
- 3.2.5. Do not interfere with 45 degree bearing splay of foundations.
- 3.2.6. Hand trim excavations. Remove loose matter.
- 3.2.7. Remove excavated material that is unsuitable for re-use from site.
- 3.2.8. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Select Material.
 - 3.2.8.1. Compact subgrade to ninety five (95) percent of the material's maximum dry density as determined by ASTM D698, Standard Proctor.
- 3.2.9. Stockpile and protect excavated material to be re-used.
 - 3.2.9.1. Stockpile shall be protected with silt fence.
 - 3.2.9.2. Contractor shall seal stockpile material to prevent the material from becoming saturated. Saturated material shall not be used for re-compaction.
- 3.2.10. Remove excess excavated material from site.

End of Section

Section 02370
Erosion and Sediment Control

1. General

1.1. Section includes specific City of Roanoke requirements for the erosion and sediment control that supplement the Virginia Erosion and Sediment Control Handbook, latest edition.

1.2. Related Sections – Not Used

1.3. References

1.3.1. Virginia Erosion and Sediment Control Handbook, latest edition

1.4. Quality Assurance

1.4.1. Unless specifically noted in this section, all work shall be performed in accordance with the Virginia Erosion and Sediment Control Handbook.

1.5. Submittals – Not Used

1.6. Definitions

1.6.1. Final stabilization – Healthy grass growth consisting of 20 plantings per square foot.

2. Products

2.1. Unless noted, all products used in erosion and sediment control measures shall meet the requirements of the Virginia Erosion and Sediment Control Handbook, latest edition.

2.2. Specific City of Roanoke Seeding Materials

2.2.1. Contractor shall note that the City of Roanoke Permanent and Temporary Seeding Specification is different than the Department of Conservation and Recreation requirement.

2.2.1.1. Between April 16th and August 31st, temporary seeding shall be German foxtail millet, applied at a rate of 30 lbs/acre. Between October 21st and February 14th temporary seeding shall consist of winter rye (cereal rye) applied at a rate of 120 lbs/acre.

2.2.1.2. Permanent seeding, applied between September 1st and October 20th or between February 15th and April 15th, shall be tall turf fescue mix (i.e. Southern Lawn). It will consist of a 50/50 blend of wyatt and dynasty tall fescues. Use blue-tag certified seed with a delivery date not greater than 30 days old from site of origin. Apply at a rate of 10 lbs per 1000 sf.

3. Execution

- 3.1. Reference plan drawings for location and type of erosion and sediment control measures used. The measures on the plan represent the minimum standards and may be supplemented by the contractor at no cost to the City as field conditions dictate.
- 3.2. Unless noted, all preparation and installation of erosion and sediment controls shall be in accordance with the Virginia Erosion and Sediment Control Handbook, latest edition.

3.3. Specific City of Roanoke Seeding Requirements

3.3.1. Preparation for Seeding

3.3.1.1. Temporary seeding areas shall be fertilized with an organic based fertilizer (14-2-6) at a rate of 1 ½ lbs of nitrogen per 1000 square feet, and mulched with continuous straw bale coverage at a rate of 80 bales/acre.

3.3.1.2. Mulch permanent seeding areas with lime at a rate of 2000 lbs/acre.

3.3.2. Installation of Seeding

3.3.2.1. Temporary seeding may be broadcast.

3.3.2.2. Permanent seeding shall be hydro-seeded with an organic based fertilizer, such as Harmony 14-3-6, at a rate of 1.5 lbs of nitrogen per 1000 sf. The second shot will be for hydromulch only applied at 750 lbs/acres.

3.4. Specific City of Roanoke Quality Control / Maintenance Requirements

3.4.1. It shall be the contractor's responsibility to ensure that the public streets adjacent to the construction areas remain free of mud, dirt, dust and/or any type of construction material or litter at all times.

- 3.4.2. Limit grading to areas of workable size so as to limit the duration of exposure of disturbed and unprotected area. All appropriate conservation practices should be applied in sequence of work. Disturbed areas that are to be left unfinished for more than 30 days shall be seeded temporarily.
- 3.4.3. Unless natural rainfall occurs, all permanently seeded areas shall be irrigated at 1 ½ inches per week.
- 3.4.4. Permanently seeded areas shall be inspected for effectiveness of germination and growth. Sparse areas shall be re-seeded.
- 3.4.5. All erosion and sediment control measures shall be checked daily and after each significant rainfall.
- 3.4.6. Silt fence shall be checked for undermining and fabric degradation. When accumulated sediment shall be removed from silt fence when sediment depth exceeds six (6) inches.
- 3.4.7. Side slopes of stockpiles shall not exceed 2 to 1.
- 3.4.8. No more than 200 feet of trench may be opened at one time.
- 3.4.9. No excavated material shall be placed in stream beds.
- 3.4.10. Erosion and sediment controls shall be removed after final stabilization.
The City of Roanoke will notify contractor when final stabilization criteria have been satisfied.

End of Section

SECTION 04501 - MASONRY RESTORATION

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Extent of masonry restoration work includes interior and exterior work of the following types:

Rebuilding damaged masonry.

Repointing mortar joints.

Masonry restoration required by Work of other trades and Contracts.

Chimney repair on Baggage and Express Building will include removal of white brick and infil with matching brick. Repoint open or failed joints. Repair cracked masonry.

New masonry for repairs shall be coordinated with the Architect. Replacement brick for repairs to doorway, chimneys and damaged brick shall be obtained from Gavin Historical Bricks, www.historicalbricks.com. Contact: John Gavin, 319-354-5251. Reference this station and send Architect's sample with quantity at start of project to insure this stock of reclaimed brick is not depleted.

New or reclaimed enameled brick repair at ticket window, entrance door and bench bases.

SUBMITTALS:

Qualification data for firms and persons specified under "Quality Assurance" article for approval and to demonstrate their capabilities and experience. Include list of completed projects with project name, addresses, telephone numbers, names of Architects and Owners, plus other information specified. Product Data: Submit manufacturers' technical data for each product indicated including recommendations for their application and use. Include test reports and certifications substantiating that products comply with requirements.

If alternative methods and materials to those indicated are proposed for any phase of restoration work, provide written description, including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this project.

Samples: Submit, for verification purposes, prior to field sample erection, samples of the following:

Each new exposed masonry material to be used for replacing existing materials. Include in each set of samples the full range of colors, colors and textures to be expected in completed work.

Each type of mortar for pointing and masonry rebuilding and repair, in form of 6" long by 1/2" wide sample strips of mortar set in aluminum or plastic channels.

Cleaning materials and proposed cleaning procedures.

Additional materials and products proposed for use.

Field Samples: Demonstrate materials and methods to be used for each type of masonry restoration work, such as patching, repointing, cement wash, lintels.

Document products, procedures and results.

For repointing areas below soffit, prepare two (2) separate sample areas of repointing approximately 3' high by 6' wide for each type of repointing required, one for demonstrating methods and quality of workmanship expected in removal of mortar from joints and the other for demonstrating quality of materials and workmanship expected in pointing mortar joints.

QUALITY ASSURANCE:

Qualifications: Work must be performed by a firm having not less than five (5) years successful experience in comparable masonry restoration projects and employing personnel skilled in the restoration processes and operations indicated.

Foreman of work of this Section shall demonstrate five (5) years as master or journeyman in the trades required for proper completion of the work. Foreman shall be present on jobsite during times that masonry repair work is in progress.

In acceptance and rejection of Work no allowance will be made for lack of skill or competence on the part of Workmen.

Workmanship shall be equal to original when compared to coursing, jointing, alignment, pointing.

Source of Materials: Obtain materials for masonry restoration from a single source for each type material required (face brick, stone, cement, sand, etc.) to ensure match of quality, color, pattern, and texture.

Pre-Installation Conference: Meet with Installer, installers of other work adjoining masonry restoration, Architect, Owner, and representatives of other entities directly concerned with performance of masonry restoration.

DELIVERY. STORAGE. AND HANDLING:

Carefully pack, handle, and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons. Unload and handle to prevent chipping and breakage.

Deliver other materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

PROJECT CONDITIONS:

Do not repoint mortar joints or repair masonry unless air temperatures are between 40 deg.F (4 deg.C) and 80 deg.F (27 -deg.C) and will remain so for at least 48 hours after completion of work.

Prevent grout or mortar used in repointing and repair work from -staining face of surrounding masonry and other surfaces. Remove immediately grout and mortar in contact with exposed masonry and other surfaces.

Conduct of the Work: Repoint masonry in a manner which eliminates the necessity for heavy washing or acid cleaning after repointing is finished. Repointed masonry shall be left looking as much like the un-repointed masonry as possible.

SEQUENCING/SCHEDULING:

Coordinate work schedule with work of other trades and Contracts.

Perform masonry restoration work in the following sequence:

Rebuild and replace masonry, such as area on south side of east waiting room.

Rake-out existing mortar from joints indicated to be repointed.

Repoint existing mortar joints of masonry indicated to be restored.

Clean masonry surfaces where soiled by work of this or other Sections.

PART 2 - PRODUCTS

MORTAR MATERIALS:

General: Provide exposed-to-view mortars and cement washes to match existing.

Masonry cement: ASTM C 91, Type N.

Portland Cement: ASTM C 150, Type II, white non-staining.

Hydrated Lime: ASTM C 207, Type 5.

Aggregate for Mortar: ASTM C 144, unless otherwise indicated.

Colored Mortar Aggregate: Natural or manufactured sand selected to match existing mortar.

Match -size, texture and gradation of existing mortar as closely as possible.

Colored mortar pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.

Water: Clean, free of oils, acids, alkalis and organic matter.

MISCELLANEOUS MATERIALS:

Anchors: Type and size required by conditions encountered. Fabricate anchors, ties and dowels from AISI Type 304 stainless steel.

Masonry Cleaner: Provide "Sure Kleen" products manufactured by ProSoCo, Inc., Kansas City, Kansas. Submit documentation of site visit and recommendations of manufacturer's representative.

TOOLS AND EQUIPMENT:

Pneumatic Carving Tool: For cutting mortar joints: Barre short-stroke pneumatic carving tool by Throw & Holden Company, Barre, Vermont (800-451-4349).

Chisels: Use specially formed chisel blades thinner than joints.

Pointing tools: Use specially formed tools as required to match original joint tooling.

Power operated rotary hand saws and grinders will NOT be permitted.

MORTAR MIXES:

Measurement and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical batch mixer.

Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix which will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1-to-2 hours. Add remaining water in small portions until mortar of desired consistency is reached. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material. Dolemetic Lime is not permitted on this job. If using dry powder lime the mix must be based on weight and not on volume. A lime putty is preferred for all repointing mortars.

Colored Mortar: Produce mortar of color required to match existing by use of selected ingredients. Do not adjust proportions without Architect's approval.

Do not use admixtures of any kind in mortar.

Mortar Proportions: Pointing mortar for brick: one part portland cement, two parts hydrated lime and 6 to 7 parts sand. Refer to existing mortars on site for selection of sand and pigment.

Rebuilding Mortar: Same as pointing mortar.

Cement Wash: Same as pointing mortar.

Patching Mortar: Provide mix composed of white cement combined with lime and selected aggregates to produce color matching color of existing brick. Proportion mix with one part cement, two parts lime and nine parts aggregate.

PART 3 - EXECUTION

PREPARATION:

Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, and surrounding buildings from injury resulting from masonry restoration work.

All work on chimneys will be done by lift. New tile roof must be protected from masonry removal, cleaning and rebuilding.

MASONRY REMOVAL AND REBUILDING, GENERAL:

General Masonry Removal: Carefully remove by hand masonry that is damaged, spalled or deteriorated. Remove masonry required by Work of other trades and Contracts, such as roof framing repairs.

Cut out full units from joint to joint and in manner to permit replacement with full size units.

Support and protect masonry indicated to remain that surrounds removal area.

Salvage as many whole, undamaged bricks and masonry units as possible.

Remove mortar, loose particles and soil from salvaged masonry by cleaning with brushes and water. Store for reuse.

Clean remaining masonry at edges of removal areas by removing mortar, dust, and loose debris in preparation for rebuilding.

Power operated rotary hand saws and grinders will NOT be permitted.

General Masonry Rebuilding: Install new or salvaged masonry to replace missing and removed units. Fit replacement units into bonding and coursing pattern of existing. If cutting is required use motor driven saw designed to cut masonry with clean, sharp unchipped edges.

Lay replacement masonry with completely filled bed, head and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet clay brick which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. - Use wetting methods which ensure that units are nearly saturated but surface dry when laid. Maintain joint width for replacement units to match existing.

Repoint new mortar joints in repaired and rebuilt area to comply with requirements for repointing existing masonry.

Carefully remove bricks, metal ties and cement wash and loose debris.

CEMENT WASH: Not in this contract

Replace all broken and hollow cement washes with new parging, sloped to match original. Determine extent of hollow washes by tapping cement washes with rubber mallet. Replace hollow washes.

Cement washes shall be free from voids.

MASONRY PATCHING:

Remove loose particles, soil, debris, oil and other contaminants from existing units by cleaning with stiff brush.

Place patching mortar in layers no thicker than one inch. Roughen surface of each layer to provide key for next.

Keep each layer damp for 72 hours or until mortar has set.

Unacceptable patches are defined as those that do not match original materials and with hairline cracks or showing separation from masonry at edges. Remove patches and refill to provide patches free of those defects.

REPOINTING EXISTING MASONRY:

General: Do not damage arises or faces of masonry. Repoint only joints where mortar is weathered, powdered or void. Do not repoint stable areas.

Joint Raking: Carefully rake out mortar from joints to depths equal to 2-1/2 times their widths but not less than 3/4" nor less than that required to expose sound, unweathered mortar.

Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.

Do not spall edges of masonry units or widen joints. Replace masonry units which become damaged.

Cut out old mortar by hand with very thin chisels and mallet, or by use of pneumatic carving tool with specially shaped thin blades.

Power operated rotary hand saws and grinders will NOT be permitted.

Joint Pointing: Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.

Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8", to minimize shrinkage, until a uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.

After joints have been filled to a uniform depth, place remaining pointing mortar in 3 layers with each of first and second layers filling approximately 2/5 of joint depth and third layer the remaining 1/5. Fully compact each layer and allow to become thumbprint hard before applying next layer. Take care not to spread mortar over edges onto exposed masonry surfaces, or to featheredge mortar.

When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.

Cure mortar by maintaining in a damp condition for not less than 72 hours.

Allow mortar to harden not less than thirty (30) days before beginning masonry cleaning work.

REPAIRING. POINTING. AND CLEANING

Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar, pointed to eliminate evidence of replacement.

Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance.

Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

Test cleaning methods on sample wall panel; leave 1/2 panel uncleansed for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

Protect adjacent masonry and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.

Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04501

SECTION 06000 - WOOD REHABILITATION WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY:

- A. Extent and location of work is throughout the project area. Types of existing wooden elements include:

1. Board soffit
2. Standing and running trim
3. Door and window assemblies
4. Dormer trim and moldings

- B. Glazing replacements are to be double strength glass.

- C. Lead paint interim control/abatement is the responsibility of the contractor. Appropriate protective wear should always be used when in contact with lead paint or other hazardous building materials. This building has been tested clean after lead paint abatement, however, there may be concealed areas or areas overlooked that may contain lead paint.

- D. Repair schedule: The contractor shall prepare a repair schedule indicating the location and extent of specific repairs to be undertaken. This schedule is to insure that the contractor and architect are in agreement as to the extent and method of repair, replacement to be undertaken, such that. Unnecessary replacement does not take place.

The repair schedule should include:

1. Annotated plans indicating the extent of repairs to the standing and running trim and the extent of replacement.
2. The method of repair shall be noted for each repair listed above, ie. Epoxy consolidation, dutchman, scarf, replacement.

- E. Shop Drawings: Indicate location, profile and other details of assembly of each element to be replaced.

- F. Samples: 12" lengths of each item to be replaced shall be supplied unless another length or more complete assemble is appropriate for the architect's approval.

1.3 QUALITY ASSURANCE:

- A. Single Source Responsibility: Obtain repair and replacement elements from a single manufacturer.

- B. Craftsman Qualifications: the General Contractor shall employ a craftsman with a minimum of 15 years experience in wood rehabilitation work similar to tasks outlined in this Section to undertake wood rehabilitation tasks specified herein. Any workers who assist the principal craftsman shall each have at least five years experience in wood rehabilitation work. Upon request by the architect, furnish references of previous projects completed by the principal craftsman and assistants including project name, location, client name and client phone number.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Protect individual elements during transit, storage and handling to prevent damage, soiling and deterioration.

1.5 PROJECT CONDITIONS:

- A. Conditioning: Do not deliver or install repair elements until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with requirements of the following quality standard applicable to project's geographical location.

- 1."Architectural Woodwork Quality Standards" including Section 100-S-3
- 2."Moisture Content" of Architectural Woodwork Institute (AWI).

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering repair elements or supplies for more than 10 years may be incorporated in the work subject to approval of the architect.

2.2 WOODEN REPAIR ELEMENTS:

- A. AWI Quality Standard:Comply with "Architectural Woodwork Quality Standards" including all appropriate sections for doors and windows of Architectural Woodwork Institute (AWI). All work shall meet AWI standards for "Custom" Grade.
- B. Wood Species for Painted Finish including all running crown and bed mold, decorative dormer boards and fascia: white oak, plain sawn. Wood shall be dried to 6-12% moisture content.
- C. Wood Species for secondary woods: Southern yellow pine, plain sawn. In damp locations a rot resistant wood species or pressure treatment shall be used
- D. Dimensions and profiles shall accurately replicate the original elements in their unpainted or finished condition.

2.3 EPOXY CONSOLIDATION MATERIALS:

- A. Epoxy resins, fillers, and hardeners especially formulated for consolidation of rotten or otherwise damaged wood may be used with the approval of the architect. Epoxy consolidants shall be installed by personnel with at least 5 years experience in this craft. Approved manufacturers of epoxy consolidants include:

- 1.Abatron, Inc. 1-800-445-1754
- 2.Epoxy Technology, Inc. 1-800-227-2201
- 3.Advanced Repair Technology 607-264-9040
- 4.Conserv Epoxies 973-579-1112
- 5.Wood Care Systems 425-827-6000

2.4 BACK PRIMING:

- A. Repair elements intended for Transparent Finish: Seal all concealed

faces and edges of elements with tinted sealer compatible with finishes indicated in:

1. Division-9 section "Painting".
- B. Repair elements not intended for Transparent Finish: Seal all faces and edges of elements with primer sealer compatible with finishes indicated in:
 1. Division-9 section "Painting".

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Examine installed woodwork for missing, rotten, or pest damaged elements. Dismantle as necessary to determine the extent of damage. Prepare the REPAIR SCHEDULE.
 1. Insure that all substrates are sound.
 2. Reject all unacceptable repairs or replacement elements.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 Window and Door Rehabilitation.

- A. Window sash may be restored off site. All intact glazing shall be carefully preserved and reused in sash. Old glazing shall be removed, glazing area and exterior shall be primed - interior stripped and prepped for staining. All sash shall retain the number assigned in phase I - relabel in weight area if needed during restoration

3.3 Window Rehabilitation Schedule Tasks

- A. PAINT EXTERIOR OF FRAME. Refer to painting instructions for interior and exterior building elements on drawings. Painting sub-contractor shall repaint existing wood frame exteriors with two coats of paint. Spot prime bare areas, consolidated areas, and any new wood.

3.4 Door and Frame Rehabilitation Schedule Tasks

A. Door and Frame Tasks

1. The doors have been labeled by the Phase I Contractor in a concealed location using door schedule numbers to assure that doors are returned to their correct frames.
2. PAINT FRAMES. Refer to Section 09912. Painting sub-contractor shall repaint existing wood frames with two coats of paint. Spot prime bare areas, consolidated areas, and any new wood. Do not paint interiors of door frames.

3.5 REHABILITATION OF OTHER WOOD ELEMENTS.

- A. Contractor shall include on the repair schedule and rehabilitate other wood

elements such as board ceilings and walls, standing and running trim in accordance with the following.

- 1.CAREFULLY REMOVE DETERIORATED WOOD ELEMENT. Remove wood element so as to minimize damage to adjacent or adjoining elements and, recognizing that, after repair and rehabilitation, the element will be reinstalled at its original location. When wood element is installed in combination with other elements such as trim, panels, or moldings, take apart the assembly so that it can be reinstalled together with his companion pieces.
- 2.DO NOT REMOVE EXISTING WOOD BLOCKING OR NAILERS. If new blocking or nailers are required, install adjacent to existing.
- 3.MAKE NEEDED REPAIRS. Refer to Section 02075 for lead paint interim control. The Contractor shall be required to make two types of epoxy repairs: 1) where existing wood surfaces have deterioration through 50% or less of their cross section area, use epoxy consolidation to make needed repairs, and, 2) where hardware has been removed by prior alteration to the wood member or where the Work of this contract requires removal of hardware (such as the removal of incidental nails, screws, or other fasteners, use epoxy consolidants to fill void areas. Use epoxy consolidants in strict accordance with manufacturer's instructions. Where pieces of existing wood element assemblies are missing, furnish and install new pieces in profiles to match existing. All wood repairs shall be in accordance with AWI Section 500, 700, and 800.
- 4.REINSTALL REPAIRED ELEMENTS. Reinstall wood elements in accordance with AWI Sections 500, 700, and 800 in their original locations. Prior to reininstallation, wood surfaces shall be back and end primed per Section 09900.

3.6 UNDERTAKE REPAIRS

- A. Based on the approved repair schedule.

Remove all damaged elements which cannot be repaired in place. With the approval of the architect dispose of all elements to be replaced.

Repair all damaged in accordance with approved rehabilitation schedule elements.

3.7 INSTALLATION:

- A. Hardware: For installation see Division-8 "Builder's Hardware" section of these specifications.
- B. Fasteners: For installation see Division-6 "Finish Carpentry" section of these specifications.
 - 1.Reinstall all repaired elements.
 - 2.Install all replacement elements, scribing and fitting the new work to the old rather than cutting the original material.

END OF SECTION 06000

SECTION 06100 - ROUGH CARPENTRY

PART I - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and other Division 1 Specification sections shall apply to this Section.

1.2 SUMMARY

- A. Work includes, rough carpentry as shown on Drawings and as specified herein; preservative treated rough carpentry as shown on Drawings and as specified herein; including rough hardware and fastenings.
- B. Work this Phase includes but is not limited to:
1. Breezeway ceiling joists.
 2. Mezzanine
 3. blocking

1.3 QUALITY ASSURANCE

- A. References: Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used).

American Institute of Timber Construction	(AITC)
American Society for Testing & Materials	(ASTM)
American Forest & Paper Association	(NFoPA)
American Plywood Association	(APA)
American Wood Preservative Association	(AWPA)
U. S. Dept. of Commerce Voluntary Product Standards	(PS)
Virginia State Building Code	(NCSBC)
Underwriters' Laboratories	(UL)

- B. Submittals: Submit written certificates from processor of preservative treatments, stating type of treatment, Manufacturer of treating material, degree of treatment of wood members processed for this Project. Certificate shall be signed by an officer of the company.
- C. Grade Marks: All lumber inclusive of structural framing members, plywood sheathing, flooring and diaphragms) shall bear and be identified by the appropriate grade mark specified herein and/or as shown on Drawings in accordance with NCSBC.
- D. Building Code: Virginia State Building Code, Volume 1 - General Construction, 1996 Edition with all current amendments.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Materials delivered to Site in a wet condition shall be rejected and removed from Owner's property.
- B. Stack lumber to insure proper ventilation and drainage. Protect lumber from the elements.
- C. Store in a manner that will prevent warpage.

1.5 PROTECTION

- A. Installed Work: Rough carpentry installed by Contractor shall be protected from the elements when work of other trades dependent on rough carpentry does not provide sufficient protection.

1.6 JOB CONDITIONS

- A. Contractor shall schedule delivery and installation of rough carpentry work to avoid delaying other trades whose work is dependent on or affected by said work.

PART II - PRODUCTS

2.1 MATERIALS

A. Moisture Content:

1. Solid wood for framing and blocking, not to exceed 19%.
2. Preservative treated solid wood shall be kiln-dried after treatment to an amount not to exceed 15%.

B. Grade and Trademark: Grade and trademark shall be on each piece of lumber (or bundle in bundled stock). Use only recognized official marks of Association under whose rules it is graded.

C. Quality:

1. Lumber shall be sound, thoroughly seasoned, well manufactured, and free from warp that cannot be corrected in process of bridging, bolting, or nailing. Woodwork exposed to view outside or inside of building shall be dressed.

2. Lumber shall comply with American Softwood Lumber Standard PS-20 and shall be identified with grade mark.

D. Grades and Species of Solid Wood: Grades and species of lumber shall be as follows, unless noted otherwise on the Drawings:

1. Roof framing (structural joists and beams): No. 2 Southern Yellow Pine.

2. Blocking, Nailers, Fence Posts and Pickets: No. 2 Southern Yellow Pine, unless otherwise noted on plan. Use treated wood for fence components.

E. Plywood:

1. Conforming to PS-1, and as mfd. by a member of APA. Panel span rating to suit support spacing.

2.2 WOOD TREATMENTS

A. Preservative Treatment: Where preservative treatment only is called for, lumber shall be pressure-treated with Osmose K-33 or Wolman CCA (chromated copper arsenate) salts. Preservative treatment shall be in accordance with the American Wood Preservative Assn. Specification C2 for material not in contact with ground or in water. Preservative shall not be carried in petroleum solvents.

2.3 FASTENERS

A. Fasteners: Except as specifically required otherwise in Contract Documents, furnish and install as detailed on Drawings and/or specified herein, rough hardware fasteners in accordance with the

N.C. State Building Code.

- B. Nails, spikes, screws, bolts and similar items, not noted on Drawings, shall be of sizes and types to rigidly secure members in place, and in accordance with applicable ASTM, and ANSI Standards.
- C. The use of powder-actuated fasteners may be acceptable upon written request to the Architect for approval.

PART III - EXECUTION

3.1 EXAMINATION

- A. Installer must examine the substrates and supporting structure and the conditions under which the carpentry work is to be installed. Notify the Contractor in writing of conditions detrimental to the work. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- B. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate the work with a minimum of joints or the optimum jointing arrangement.

3.2 INSTALLATION

A. General:

1. Fit carpentry work to other work. Scribe and cope as required for accurate fit.
2. Set carpentry work accurately to required levels and lines with members plumb and true.
3. Securely attach carpentry work to substrates by anchoring and fastening as shown on Drawings and as required by NCSBC.

a. Provide washers under bolt heads and nuts in contact with wood.

b. Countersink fastener heads as shown on Drawings or where required for proper fit.

4. Fasteners:

a. Make tight connections between members.

b. Install fasteners without splitting of wood; predrill as required.

c. Tighten bolts and lag screws at installation and retighten as required for tight connections prior to closing in or at completion of work.

d. Fasteners shall meet all load-carrying requirements of NCSBC.

e. The use of adhesives shall be limited to areas specifically detailed on Drawings.

3.3 FRAMING, FURRING, AND STRIPPING

- A. Erect wood framing, furring, stripping and nailing members true to lines and levels. Do not deviate from true alignment more than 1/4 inch.
- B. Space members at 16 inches on center unless noted otherwise on Drawings.
- C. Construct members of continuous pieces of longest possible lengths.
- D. Construct and erect required built-up beams, lintels, diaphragm

- E. beams as detailed on Drawings.
- F. Not used
- F. Provide double joist headers at joist ends and around floor and ceiling openings. Bridge floor joists as detailed on Drawings.

- G. Place full width continuous sill flashings under exterior wood framed walls placed on masonry construction, unless noted otherwise.
- H. Coordinate installation of wood trusses, beams, and joists with work of other trades.

3.4 LOCATION OF PRESERVATIVE TREATED LUMBER

- A. All wood nailers and framing members in walls adjacent to masonry and/or concrete construction.
- B. All nailers in contact with slab-on-grade.

3.5 WORKMANSHIP

- A. Work which does not conform to specified requirements, including tolerances and finishes, shall be corrected and/or replaced as directed by Architect, at Contractor's expense, without extension of time. Contractor shall also be responsible for cost of corrections to any work affected by or resulting from correction to work of this Section.

END OF SECTION

SECTION 06200 - FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Exterior standing and running trim.
2. Wood beaded ceiling boards.
3. Wood dormer trim.
4. Ticket Office cabinetry.

- B. Related Sections include the following:

1. Division 1 Section "Alternates" for alternate bids involving Division 2 Section "Lead Paint Abatement and Interim Control" for wood alteration and preparatory work.
1. Division 6 Section "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
2. Division 6 Section "Wood Rehabilitation Work" for repair and rehabilitation of existing wood elements.
3. Division 9 Section "Painting" for priming and backpriming of finish carpentry.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 specification Sections.

- B. Product Data for each type of factory-fabricated product and process specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.

- C. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated material:

1. For each type of preservative-treated wood product include certification by treating plant stating type of preservative solution and process used, net amount of preservative retained, and compliance with applicable standards.
2. For water-borne-treated products include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.

- D. Samples for initial selection of the following in the form of actual units or sections of units showing the full range of

colors, textures, and patterns available for each type of material indicated.

E. Product certificates signed by woodwork fabricator certifying that products comply with specified requirements.

F. Quality Marking: Mark each unit or architectural woodwork with mill or fabricator identification and grade mark, located on surfaces which will not be exposed after installation.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units without delaying the Work.

B. Installer Qualifications: Arrange for interior architectural woodwork installation by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.

C. Single-Source Responsibility for Fabrication and Installation: Engage a qualified woodworking firm to assume undivided responsibility for fabricating, finishing, and installing woodwork specified in this Section.

D. Quality Standard: Except as otherwise indicated, comply with the following standards.

1. AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grades of interior architectural woodwork, construction, finishes, and other requirements.

a. Provide AWI Certification Labels or Certificates of Compliance indicating that woodwork meets requirements of grades specified.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

B. Do not deliver interior finish carpentry until environmental conditions meet requirements specified for installation areas. If finish carpentry must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry until building is enclosed and weatherproof, wet work in

space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit work to be performed according to manufacturer's written instructions and warranty requirements and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.

C. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate progress to avoid delaying the Work.

1. Verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork by accurate field measurements before being enclosed. Record measurements on final shop drawings.

D. COORDINATION

1. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS GENERAL

A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade indicated and, where the following products are part of interior woodwork, with requirements of the referenced product standards that apply to product characteristics indicated:

B. Wood Moisture Content: Provide kiln-dried lumber with an average content range from 9% to 13% for exterior work and 6% to 11% for interior work. Maintain temperature and relative humidity during fabrication, storage and finishing operations so that moisture content values for woodwork at time of installation do not exceed 5%-10% for mild regions.

2.2 INSTALLATION MATERIALS

A. Furring, blocking, shims, and hanging strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

B. Screws: Select materials, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements.

C. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.

D. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors.

E. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," for lumber and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee Board of Review.

F. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:

1. NELMA- Northeastern Lumber Manufacturers Association.
2. NHLA - National Hardwood Lumber Association.
3. NLGA - National Lumber Grades Authority.
4. SPIB-Southern Pine Inspection Bureau.
5. WCLIB-West Coast Lumber Inspection Bureau.
6. WWPA-Western Wood Products Association.

G. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.

H. Veneer Plywood: Plywood or lumber core with select birch veneer.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: Comply with AWPA C2 (lumber) and AWPA C9 (plywood) and the following for items indicated to receive pressure preservative treatment. Mark each treated item with the Quality mark Requirements of an inspection agency approved by American Lumber Standards committee board of Review.

1. Preservative Chemicals: Pressure-impregnate woodwork with preservative chemicals acceptable to authorities having jurisdiction. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated materials.

- a. Do not use chemicals containing chromium or arsenic.
2. Pressure-treat above ground items with preservatives to a minimum retention of 0.25 lb/cu. ft. (4 kg/cu. m). Kiln-dry lumber and plywood to a minimum moisture content of 19 and 15 percent after treatment (KDAT), respectively.

2.4 EXTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

- A. Quality Standard: Comply with AWI Section 300.

1. Grade: custom.
- B. Assemble moldings in plant to maximum extent possible. Miter corners in plant and prepare for field assembly with bolted fittings designed to pull connections together.
- C. Wood species: White Oak or Red Oak per drawings. Finish - stain grade.
- D. Texture: one face saw textured, the other surfaced (smooth).

2.5 EXTERIOR BEADED BOARD FOR CLEAR FINISH

- A. Quality Standard: Comply with AWI Section 300.
 1. Grade: custom.
- B. Assemble moldings in plant to maximum extent possible. Miter corners in plant and prepare for field assembly with bolted fittings designed to pull connections together.
- C. Wood species: White Oak or Red Oak per drawings. Finish - stain grade.
- D. Texture: one face saw textured, the other surfaced (smooth).

2.6 ADDITIONS AND REPAIRS TO EXISTING WOODWORK

- A. Quality Standard: Comply with AWI Section 400 requirements for wood cabinets.
 1. Grade: custom

2.13 MISCELLANEOUS MATERIALS

- A. Fasteners for Exterior Finish Carpentry: Provide nails or screws of the following materials, in sufficient length to penetrate minimum of 1-1/2 inches (38 mm) into substrate, unless otherwise recommended by manufacturer:
 1. Stainless steel.
- B. Flashing: Comply with requirements of Division 7 Section "Sheet Metal Flashing and Trim" for flashing materials installed in finish carpentry.
- D. Sealants: Comply with requirements in Division 7 Section "Joint Sealants" for materials required for sealing siding work.

2.14 FABRICATION

- A. Wood Moisture Content: Comply with requirements of specified inspection agencies and with manufacturer's written recommendations for moisture content of finish carpentry at relative humidity conditions existing during time of fabrication and in installation areas.
- B. Fabricate finish carpentry to dimensions, profiles, and details indicated.

1. Back out or kerf backs of the following members, except members with ends exposed in finished work.
 - a. Exterior standing and running trim wider than 5 inches (125 mm).
 2. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16 inch (1.5-mm) radius.
 3. Ease edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8 inch (3-mm) radius.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and performance of finish carpentry. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Condition finish carpentry to average prevailing humidity conditions in installation areas before installation, for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.
- C. Prime and back prime lumber for painted finish exposed on the exterior. Comply with requirements for surface preparation and application in Division 9 Section "Painting."
- D. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.3 INSTALLATION, GENERAL

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Park 2 of this Section for type of woodwork involved.
- B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) for plumb and level (including tops).

- C. Do not use finish carpentry materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
 - 1. Do not use manufactured units with defective surfaces, sizes, or patterns.
- D. Scribe and cut finish carpentry to fit adjoining work. Refinish and seals cuts as recommended by manufacturer.
- E. Countersink nails, fill surface flush, and sand where face nailing is unavoidable.
- F. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) for plumb and level. Install adjoining finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
- G. Coordinate finish carpentry with materials and systems in or adjacent to standing and running trim and rails. Provide cutouts for mechanical and electrical items that penetrate exposed surfaces of trim and rails.
- H. Refer to Division 9 Sections for final finishing of finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 36 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints, if required. Fill gaps, if any, between top of base and wall with plastic wood filler and sand smooth.
 - 1. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.
 - 2. Fit exterior joints to exclude water.
 - 3. Install standing and running trim with no more than 1/8" in 96 inches variation from a straight line.

3.6 WOOD THRESHOLD INSTALLATION

- A. Set wood thresholds in a full bed of waterproof mastic.

3.7 All exterior beaded board ceiling material will be new.

3.8 WOOD WINDOW INSTALLATION

- A. Reinstall all existing window sash, adjust, re-attach weights to bottom sash only, seal top sash.

3.10 CLEANING

- A. Clean finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.11 PROTECTION

- A. Provide final protection and maintain conditions that ensure finish carpentry is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 06200

SECTION 07605 - SHEET METAL

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

SUMMARY

This Section includes the following:

Metal downspouts - New 16oz. copper

SUBMITTALS

Product data, Flashing, Sheet Metal, and Accessories: Manufacturer's technical product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

Samples of the following flashing, sheet metal, and accessory items:

8-inch-square samples of specified sheet materials to be exposed as finished surfaces.

12-inch-long samples of factory-fabricated products exposed as finished work. Provide complete with specified factory finish.

Shop drawings showing layout, profiles, methods of joining, and anchorages details, including major counterflashings, trim/fascia units, gutters, downspouts, scuppers, cornice, leader boxes, and expansion joint systems.

Provide layouts at 1/4-inch scale and details at 3-inch scale.

PROJECT CONDITIONS

Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

Guarantee all work in this section shall be unconditionally guaranteed for two years from the date of substantial completion.

PART 2 - PRODUCTS

COPPER DOWNSPOUTS:

- A. copper sheet complying with ASTM B 101, temper designation H00, consisting of cold-rolled copper sheet coated both sides with lead weighing not less than 12 lbs. Nor more than 15 lbs. Per 100 sq. ft. of copper sheet (one half of total weight of lead applied each side), and as follows:

1. Weight of Coated Sheet: Not less than 17.1 oz. Per sq. ft.

(nominal weight of bare copper sheet, 16 oz.), unless otherwise indicated.

- B. Miscellaneous Materials: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants and accessory items as recommended by copper sheet manufacturer and fabricator for copper work, except as otherwise indicated.
- C. Accessories: Except as indicated as work of another specification section, provide components required for a complete gutter system, including trim, copings, clips, seam covers, sealants and gaskets. Match materials and finishes of roof.
- D. Solder: ASTM Specification B-32, composition 50% tin and 50% lead. 60/40 tin/lead for copper.
- E. Flux: Muratic acid neutralized with zinc or approved brand of soldering flux.
- F. Rivets: 1/8" - 3/16" diameter, with solid copper mandrels and washers.

FABRICATED UNITS:

- 1. General: custom fabricate sheet metal roofing to comply with recommendations in SMACNA's Architectural Sheet Metal Manual that apply to the design, dimensions, geometry, metal thickness and other characteristics of installation indicated. Fabricate sheet metal accessories at the shop to greatest extent possible.
- 2. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep filled with sealant (concealed within joints).
- 3. Sealant Joints: where movable, nonexpansion-type joints are indicated or required to produce weathertight seams, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.
- 4. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with permanent separation as recommended by manufacturer/fabricator. Resistance across joint shall exceed 500,000 OHMS.

PART 3 - EXECUTION

INSTALLATION REQUIREMENTS

Inspection: Inspect all surfaces to which sheet metal, and accessories are to be installed. Do not install sheet metal work unless such surfaces are sound, dry, clean, and free of defects detrimental to sheet metal installation.

General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

Downspouts: Join sections with 1 $\frac{1}{2}$ " telescoping joints. Provide fasteners designed to hold downspouts securely to walls; locate fasteners at top and

bottom and at approximately 60 inches o.c. in between.

Install counterflashing in existing reglets, by snap-in seal arrangement and filling reglet with elastomeric sealant.

CLEANING AND PROTECTION

Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

Protection: Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion.

ROOFING WARRANTY - 25 years.

END OF SECTION 07605

SECTION 07901 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealants for the following locations:
 - 1.Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:
 - a.Control and expansion joints in unit masonry.
 - b.Joints between different materials.
 - c.Perimeter joints between materials listed above and frames of doors and windows.
 - d.Other joints as indicated.
 - e.Joints where pavement abuts building walls.
 - 2.Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
 - a.Control and expansion joints on exposed interior surfaces.
 - b.Perimeter joints of exterior openings where indicated.
 - c.Perimeter joints between interior wall surfaces and frames of interior doors, windows, and entrances.
 - d.Perimeter joints of toilet fixtures.
 - e.Other joints as indicated.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- B. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - B. Product data from manufacturers for each joint sealant product required.

- C. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- D. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.
- B. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 - 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4.4 deg C).
 - 3. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.8 SEQUENCING AND SCHEDULING

- A. Sequence installation of joint sealants to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise

indicated.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
 1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920 requirements including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.
 1. For Exterior Use, One-Part Polysulfide Sealant: Type S; Grade NS; Class 12-1/2; Complying with FS TT-S-00230, Class A, Type II (Non-Sag) unless Type I is recommended by manufacturer for the application shown.
 2. For Interior Wet Areas:
 - a. One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25; Uses Nt, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide; intended for sealing interior joints subject to in-service exposure to conditions of high humidity and temperature extremes.
 - b. One-Part Nonsag Urethane Sealant for Use T: Type S, Grade NS, Class 25, and complying with the following requirements for Uses:

Uses T, NT, M, G, A, and, as applicable to joint substrates indicated, O.

Uses T, NT, A, and, as applicable to joint substrates indicated, O.

- B. Products: Subject to compliance with requirements, provide one of the following:

One-Part Polysulfide Sealant:

"Sonolastic 1-Part"; Sonneborn NP-1
"Chem-Calk 100"; Bostik Construction Products Div.
"GC-9 Synthacalk"; Pecora Corp.
"PRC Rubber Calk 7000"; Product Research & Chemical Corp.

One-Part Mildew-Resistant Silicone Sealant:

"Dow Corning 786"; Dow Corning Corp.

"SCS 1702 Sanitary"; General Electric Co.
"863 #345 White"; Pecora Corp.
"Rhodorsil 6B White"; Rhone-Poulenc Inc.

2.3 LATEX JOINT SEALANTS

- A. General: Provide manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.
- B. Acrylic-Emulsion Sealant: Provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Acrylic-Emulsion Sealant:
 - a. "AC-20," Pecora Corp.
 - b. "Sonolac," Sonneborn Building Products Div., ChemRex, Inc.
 - c. "Tremco Acrylic Latex 834," Tremco, Inc.

2.7 TAPE SEALANTS

- A. Tape Sealant: Manufacturer's standard, solvent-free, butyl-based tape sealant with a solids content of 100 percent formulated to be nonstaining, paintable, and nonmigrating in contact with nonporous surfaces with or without reinforcement thread to prevent stretch and packaged on rolls with a release paper on one side.
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. "Extru-Seal Tape," Pecora Corp.
 - 2. "Shim-Seal Tape," Pecora Corp.
 - 3. "PTI 606," Protective Treatments, Inc.
 - 4. "Tremco 440 Tape," Tremco, Inc.
 - 5. "MBT-35," Tremco, Inc.

2.8 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of

material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Open-cell polyurethane foam.
 2. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
 3. Proprietary, reticulated, closed-cell polymeric foam, nonoutgassing, with a density of 2.5pcf and tensile strength of 35 psi per ASTM D 1623, and with water absorption less than 0.02 gms/cc per ASTM C 1083.
- C. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Accessory Materials for Fire-Stopping Sealants: Provide forming, joint fillers, packing and other accessory materials required for installation conditions indicated.

2.10 JOINT FILLERS FOR CONCRETE PAVING

- A. General: Provide joint fillers of thickness and widths indicated.
- B. Bituminous Fiber Joint Filler: Preformed strips of composition below, complying with ASTM D 1751:
Asphalt saturated fiberboard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form release agents from concrete.

4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

- B. Sealant Installation Standard: Comply with recommendations of

ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
 1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 2. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
 - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
 3. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.
- G. Installation of sidewalk filler/sealant: Where sidewalk adjoins structure, place bituminous joint filler first with sufficient recess for application of sealant at top.

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 07901

SECTION 08212 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Exterior stile and rail wood doors.
2. Interior stile and rail wood doors.
3. Factory fitting stile and rail wood doors to frames and factory machining for hardware.
4. Rolling Baggage Room Doors.

- B. Related Sections include the following:

1. Division 6 Section "Finish Carpentry" for wood door frames.

1.3 SUBMITTALS

- A. Product Data: For each type of door. Include details of construction and glazing.
 1. Include adhesive manufacturer's product data indicating urea-formaldehyde content.

- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.

- C. Product Certificates: Signed by door manufacturers.

1.4 QUALITY ASSURANCE

- A. Quality Standard for Doors of Special Design and Construction: Comply with AWI's "Architectural Woodwork Quality Standards" unless more stringent requirements are specified.

1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in opaque plastic bags or cardboard cartons.
- C. Mark each door on top and bottom edge with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, and have warped (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Interior Doors: One year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide custom stile and rail doors by any local fabricator complying with these specifications.

2.2 MATERIALS

- A. General: Use only materials that comply with referenced quality standards unless more stringent requirements are specified.
 - 1. Assemble interior doors and frames, including components, with either dry-use or wet-use adhesives complying with ASTM D 5572 for finger joints and ASTM D 5751 for joints other than finger joints.
- B. Low-Emitting Materials:
 - 1. Provide doors made with adhesives and composite wood products that do not contain added urea-formaldehyde resins.

2.3 STILE AND RAIL DOORS OF SPECIAL DESIGN AND CONSTRUCTION

A. Construction, General:

1. Grade of Doors for Opaque Finish: Custom.
2. Wood Species and Cut for interior face of Transparent Finish: Red Oak
3. Panel Designs: Drawings indicate panel designs. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

B. Door Construction for Opaque Finish:

1. Stile and Rail Construction: Clear lumber; may be edge glued for width.
2. Raised-Panel Construction: Clear lumber, edge glued for width.

C. Doors:

1. Stile and Rail Widths: As indicated.
2. Molding Profile: As indicated.
3. Raised-Panel Thickness: As indicated.
4. Flat-Panel Thickness: As indicated.

2.4 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/2 inch (13 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 3/8 inch (10 mm) from bottom of door to top of threshold.
2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W Series standards, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Exterior Doors: Factory treat exterior doors after fabrication with water-repellent preservative to comply with WDMA I.S.4. Flash top of outswinging doors with manufacturer's standard metal flashing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and substrates, with Installer present, for suitable conditions where wood stile and rail doors will be installed.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install wood door frames level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Countersink fasteners, fill surface flush, and sand smooth.
- B. Hardware: For installation, see Division 8 Section "Door Hardware."
- C. Install wood doors to comply with manufacturer's written instructions and with referenced quality standard, and as indicated.
- D. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
- E. Field-Finished Doors: Refer to the following for finishing requirements:
 - 1. Division 9 Section "Painting."

3.3 ADJUSTING AND PROTECTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

SECTION 08610 - WOOD WINDOWS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

SUMMARY

This Section includes the following wood window types:

Double-Hung Window Units.
Pivoting Window Units.

Related Sections: The following sections contain requirements that relate to this section:

Interior and exterior wood trim that is not included as part of the wood window units is specified in Division 6 Section "Finish Carpentry."

Joint sealing between wood windows and adjacent materials is specified in Division 7 Section ¹¹"Joint Sealers."

Glazing requirements for wood windows, including those specified to be factory glazed, are specified in Division 8 Section "Glass and Glazing."

Field finishing factory wood windows is specified in Division 9 Section "Painting."

SUBMITTALS

General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections:

Product data for each type of wood window required, including:

Standard construction details and fabrication methods.

Profiles and dimensions of individual components.
Data on hardware, accessories, and finishes.

Shop drawings for each type of window specified.

Layout and installation details, including anchors.

Typical window unit elevations at 3/4-inch scale.

Full-size details of typical and composite members.

Hardware, including operators.

Glazing details.

Accessories.

Samples for Verification Purposes: The Architect reserves the right to require samples that show fabrication techniques and workmanship and design of hardware and accessories.

QUALITY ASSURANCE

Wood Window Standard: Comply with NWWDA I.S. 2 for standards of performance and fabrication workmanship for wood windows.

Safety Glass Standard: Provide the type of products indicated that comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.

Provide safety glass permanently marked with the certification label of the Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.

Glazing Standards: Comply with recommendations of the Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated.

Single Source Responsibility: Provide windows produced by a single fabricator who is capable of indicating prior successful production of units similar to those required.

Design Concept: The drawings indicate window sizes, profiles, and dimensional requirements and are based on the specific types indicated. Window units by other manufacturers having equal performance characteristics may be considered, provided deviations from indicated dimensions and profiles are minor and do not change the design concept or intended performance as judged by the Architect. The burden of proof for equality is on the proposer.

PROJECT CONDITIONS

Field Measurements: Check actual window openings by accurate field measurement before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

Where necessary, proceed with fabrication without measurements, and coordinate tolerances to ensure proper fit of window units.

WARRANTY

Wood Window Warranty: Submit a written warranty, executed by the window manufacturer, agreeing to repair or replace units that fail in materials or workmanship within one year following the date of substantial completion. Failures include, but are not necessarily limited to:

Structural failures, including excessive deflection, excessive leakage, or air infiltration.

Faulty operation of window sash or hardware.

Deterioration of metals, finishes, and other materials beyond normal weathering.

The warranty shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

MANUFACTURERS

Subject to compliance with specification and drawing requirements, wood windows by local millwork suppliers will be permitted.

MATERIALS

General: Comply with requirements of NWWDA I.S. 2.

Wood: Clear No. 1 Longleaf Southern Yellow Pine (plain sawn), Old Growth Heart Pine or other suitable fine-grain lumber approved by the Architect, that has been kiln dried to a moisture content of 6 to 12 percent at time of fabrication and is free of visible finger joints, blue stain, knots, pitch pockets and surface checks larger than 1/32 inch wide by 2 inches long.

Anchors, Clips, and Accessories: Fabricate concealed anchors, clips and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with the requirements of ASTM B 633 for SC 3 (severe) service condition; provide strength sufficient to withstand design pressure indicated.

Fasteners: Comply with NWWDA I.S. 2 for fabrication and with manufacturer's recommendations and standard industry practices for type and size of installation fasteners.

Use zinc-coated or nonferrous nails and screws for window fabrication and installation.

Use brass screws for hardware and accessory installation.

Hardware: Hardware as herein specified, necessary to operate, tightly close, and securely lock windows. Do not use aluminum in frictional contact with other metals.

Compression Weatherstripping: Provide compressible weatherstripping at new exterior D.H. sashes, designed for permanently resilient sealing under bumper or wiper action, completely concealed when sash is closed.

Weatherstripping material: Nonferrous spring metal.

Glass and Glazing Materials: Refer to "Glass and Glazing" section for glass and glazing requirements applicable to wood window units.

DOUBLE-HUNG WINDOWS

Window Grade: Comply with the requirements of NWWDA Performance Grade 40.

Hardware for Office Building Windows: Provide the following equipment and operating hardware:

Sash Balances: Manufacturer's standard concealed, counterbalancing mechanism-type sash balances (2 per sash).

Lock: Cam action sweep lock and keeper on the lower rail at exterior sashes only.

Lift Handle: Applied sash lifts on bottom rail of lower sash, 1 @ sashes under 16" wide, 2 @ sashes over 16" wide.

Hardware for Windows: Provide the following equipment and operating hardware where missing:

Sash Balances: Refurbish existing sash pulleys. Where missing replace with Blaine Window Hardware, inc. (www.blainewindow.com) sash pulley to match face-plate width and length.

Lock:

Lift Handle:

FABRICATION

General: Provide the manufacturer's standard fabrication of units. Comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.

Comply with requirements of referenced standards for moisture content of lumber at time of fabrication and for relative humidity conditions in the installation areas.

Fabricate windows to produce units that are reglazable without dismantling sash framing. Provide openings and mortises precut, where possible, to receive hardware and other items.

Each window unit includes sash, frame, stops, sill (including undersill or nosing), exterior casing and moldings, hardware, and accessories.

Provide weatherstripping at perimeter of each exterior operating sash.

For double/single-hung sash, provide weatherstripping only at horizontal rails of operable sash.

Provide glazing stops, nailed, coordinated with glass selection and glazing system indicated.

Preglazed Window Units: Except for light sizes in excess of 100 united inches, preglaze window units at the shop before delivery, unless preglazing is not available from the fabricator.

Groove Glazing: Preglazed units without removable stops or other provisions permitting convenient field disassembly to facilitate replacement of broken glass will not be accepted.

Complete fabrication, assembly, finishing, hardware application, and other work before shipment to the project site, to the maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

FINISHES

Wood Finish: Units shall be field finished. Windows will be treated with a paintable wood preservative on the exterior and hidden frame parts, primed and painted in accordance with Section 9900 Painting. The interior sash and frame shall match interior trim and woodwork.

PART 3 - EXECUTION

INSPECTION

Inspect openings before beginning installation. Verify that the opening is correct and the sill plate is level. Do not proceed with installation of

window units until unsatisfactory conditions have been corrected.

Wood frame walls shall be dry, clean, sound and well-nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in the opening and within 3 inches of the corner.

Coordinate window installation with wall flashings and other built-in components.

INSTALLATION

Comply with manufacturer's instructions and recommendations for installation of window units, hardware, operators, accessories, and other window components.

Set units plumb, level, true to line, without warp or rack of frames or sash.
Provide proper support and anchor securely in place.

Set sill members in a bed of compound or with joint fillers or gaskets as indicated, to provide weathertight construction.

ADJUSTING

Adjust operating sash and hardware to provide a tight fit at contact points and weatherstripping, and to provide smooth operation and a weathertight closure. Lubricate hardware and moving parts.

CLEANING

Clean interior and exterior surfaces promptly after installation. Take care to avoid damage to protective coatings and finishes. Remove excess glazing and sealants, dirt, and other substances.

Clean glass of preglazed window units promptly after installation. Wash and polish glass on both faces before Substantial Completion. Comply with manufacturer's recommendations for final cleaning and maintenance. Remove nonpermanent labels from glass surfaces.

Remove and replace glass that has been broken, chipped, cracked, abraded or damaged during the construction period.

PROTECTION

Protect window units from damage or deterioration until time of substantial completion.

END OF SECTION 08610

SECTION 08711 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Commercial door hardware for the following:
 - a. Swinging doors.

1.3 SUBMITTALS

A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of door hardware indicated.

C. Samples: For exposed door hardware of each type indicated below, in specified finish, full size. Tag with full description for coordination with the Door Hardware Schedule. Submit samples before, or concurrent with, submission of the final Door Hardware Schedule.

1. Door Hardware: As follows:

- a. Hinges.
- b. Lever Sets.
- c. Bolts.
- d. Locksets.
- e. Cylinders and keys.
- f. Closers.
- g. Stops
- h. Weatherstripping.

2. Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

D. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware

Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
 - a. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
 5. Submittal Sequence: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit the final Door Hardware Schedule after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.
- E. Keying Schedule: Prepared by or under the supervision of supplier, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.
- F. Product Certificates: Signed by manufacturers of electrified door hardware certifying that products furnished comply with requirements.
 1. Certify that door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.
- G. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.
- H. Warranties: Special warranties specified in this Section.

- A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
 - 1. Electrified Door Hardware Supplier Qualifications: An experienced door hardware supplier who has completed projects with electrified door hardware similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who is acceptable to manufacturer of primary materials.
 - 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- D. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
- E. Regulatory Requirements: Comply with provisions of the following:
 - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch (13 mm) high. Bevel raised thresholds with a slope of not more than 1:2.
 - 2. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
 - c. Thresholds: Not more than 1/2 inch (13 mm) high.

- F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
- G. Keying Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
 1. Function of building, flow of traffic, purpose of each area, degree of security required.
 2. Preliminary key system schematic diagram.
 3. Requirements for key control system.
 4. Address for delivery of keys.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Review methods and procedures related to electrified door hardware including, but not limited to, the following:
 1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
 2. Review sequence of operation for each type of electrified door hardware.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review required testing, inspecting, and certifying procedures.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver keys to Owner.

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies.

1.7 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and

run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of operators and door hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section, and the Door Hardware Schedule at the end of Part 3].

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products.
2. Sequence of Operation: Provide electrified door hardware function and sequence of operation.

2.2 HINGES AND PIVOTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hinges:
 - a. Baldwin Hardware Corporation (BH).
 - b. Bommer Industries, Inc. (BI).
 - c. Hager Companies (HAG).
 - d. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK) (specified).
 - e. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
 - f. Stanley Commercial Hardware; Div. of The Stanley Works (STH).

B. Standards: Comply with the following:

1. Butts and Hinges: BHMA A156.1.

C. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches (1524 mm).
2. Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
3. Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).
4. For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

- D. Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches)	
		Standard Weight	Heavy Weight
32 by 84 by 1-3/8	3-1/2	0.123	-
36 by 84 by 1-3/8	4	0.130	-
36 by 84 by 1-3/4	4-1/2	0.134	0.180
42 by 90 by 1-3/4	4-1/2	0.134	0.180
48 by 120 by 1-3/4	5	0.146	0.190

Maximum Door Size (mm)	Hinge Height (mm)	Metal Thickness (mm)	
		Standard Weight	Heavy Weight
813 by 2134 by 35	89	3.1	-
914 by 2134 by 35	102	3.3	-
914 by 2286 by 38	114	3.4	4.6
1067 by 2286 by 38	114	3.4	4.6
1219 by 3048 by 38	127	3.7	4.8

- E. Hinge Weight: Unless otherwise indicated, provide the following:

1. Entrance Doors: Heavy-weight hinges.
2. Interior Doors: Standard-weight hinges.

- F. Fasteners: Comply with the following:

1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.

2.3 LOCKS AND LATCHES

- A. Standards: Comply with the following:

1. Bored Locks and Latches: BHMA A156.2.
2. Mortise Locks and Latches: BHMA A156.13.

- B. Bored Locks: BHMA Grade 1.
- C. Mortise Locks: Stamped steel case with steel or brass parts; BHMA Grade 1.
- D. Lock Trim: Comply with the following:
 - 1. Lever: Forged.
 - 2. Lockset Designs: Provide the lockset design designated below or, if sets are provided by another manufacturer, provide designs that match those designated:
 - a. Bored Locks: Provide design indicated on Drawings.
- E. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
 - 1. Bored Locks: BHMA A156.2.
 - 2. Mortise Locks: BHMA A156.13.
- F. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
 - 1. Bored Locks: Minimum 1/2-inch (12.7-mm) latchbolt throw.
 - 2. Mortise Locks: Minimum 3/4-inch (19-mm) latchbolt throw.
 - 3. Deadbolts: Minimum 1-inch (25-mm) bolt throw.
- G. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.

2.4 DOOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Chain Bolts at Double entry door:
 - a. Van Dyke's Restorers #GR-206207 Bronze finish
- B. Standards: Comply with the following:
 - 1. Surface Bolts: BHMA A156.16.
 - 2. Manual Flush Bolts: BHMA A156.16.
- C. Surface Bolts: BHMA Grade 1.
 - 1. Flush Bolt Heads: Minimum of 1/2-inch- (12.7-mm-) diameter rods of brass, bronze, or stainless steel with minimum 12-inch- (305-mm-) long rod for doors up to 84 inches (2134 mm) in height. Provide longer rods as necessary for doors exceeding 84 inches (2134 mm).
- D. Bolt Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
 - 1. Half-Round Surface Bolts: Minimum 7/8-inch (22-mm) throw.

2.5 CYLINDERS AND KEYING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cylinders: Same manufacturer as for locks and latches.
- B. Standards: Comply with the following:
 - 1. Cylinders: BHMA A156.5.
- C. Cylinder Grade: BHMA Grade 1.
- D. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
 - 1. Number of Pins: Six.
 - 2. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
 - a. High-Security Grade: BHMA Grade 1A, listed and labeled as complying with pick- and drill-resistant testing requirements of UL 437 (Suffix A).
- E. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
 - 1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.
- F. Construction Keying: Comply with the following:
 - 1. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
 - 2. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
 - a. Replace construction cores with permanent cores, as indicated in keying schedule.
- G. Keying System: Unless otherwise indicated, provide a factory-registered keying system complying with the following requirements:
 - 1. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
 - a. Cylinders shall be master keyed.
- H. Keys: Provide nickel-silver keys complying with the following:
 - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."

2. Quantity: In addition to one extra blank key for each lock, provide the following:
 - a. Cylinder Change Keys: Three.
 - b. Master Keys: Five.
 - c. Grand Master Keys: Five.
 - d. Great-Grand Master Keys: Five.
- I. Key Control System: BHMA Grade 1 system, including key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers. Contain system in metal cabinet with baked-enamel finish.
 1. Wall-Mounted Cabinet: Cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.
 2. Cross-Index System: Set up by key control manufacturer, complying with the following:
 - a. Card Index: Furnish four sets of index cards for recording key information. Include three receipt forms for each key-holding hook.

2.6 STRIKES

- A. Standards: Comply with the following:
 1. Strikes for Bored Locks and Latches: BHMA A156.2.
 2. Strikes for Mortise Locks and Latches: BHMA A156.13.
 3. Strikes for Interconnected Locks and Latches: BHMA A156.12.
 4. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 5. Dustproof Strikes: BHMA A156.16.
- B. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated.
- C. Dustproof Strikes: BHMA Grade 1.

2.7 CLOSERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Surface-Mounted Closers:
 - a. Corbin Russwin Architectural Hardware; Div. of Yale Security Inc. (CR).
 - b. LCN Closers; an Ingersoll-Rand Company (LCN).
 - c. Norton Door Controls; Div. of Yale Security Inc. (NDC).
 - d. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
 - e. Yale Security Inc.; Div. of Williams Holdings (VAL).
- B. Standards: Comply with the following:
 1. Closers: BHMA A156.4.
- C. Surface Closers: BHMA Grade 1.

D. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.8 STOPS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Baldwin Hardware Corporation (BH).
2. Hager Companies (HAG).
3. Ives: H. B. Ives (IVS).
4. Norton Door Controls; Div. of Yale Security Inc. (NDC).
5. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
6. Yale Security Inc.; Div. of Williams Holdings (YAL).

B. Standards: Comply with the following:

1. Stops and Bumpers: BHMA A156.16.
2. Door Silencers: BHMA A156.16.

C. Stops and Bumpers: BHMA Grade 1.

D. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.

E. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

2.9 WEATHERSTRIPPING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Weatherstripping:
 - a. Macklanburg Duncan Co.

2.10 MISCELLANEOUS DOOR HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. PEMKO.
2. Reece

B. Standard: Comply with the following:

1. Auxiliary Hardware: BHMA A156.16.

C. Auxiliary Hardware: BHMA Grade 1.

2.11 FABRICATION

- A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.
 - 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - 2. Steel Machine or Wood Screws: For the following fire-rated applications:
 - a. Mortise hinges to doors.
 - b. Strike plates to frames.
 - c. Closers to doors and frames.
 - 3. Steel Through Bolts: For the following fire-rated applications, unless door blocking is provided:
 - a. Surface hinges to doors.
 - b. Closers to doors and frames.
 - c. Surface-mounted exit devices.
 - 4. Spacers or Sex Bolts: For through bolting of hollow metal doors.
 - 5. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.12 FINISHES

- A. Standard: Comply with BHMA A156.18.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are

acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- D. BHMA Designations: Comply with base material and finish requirements indicated by the following:
1. BHMA 613: Dark-oxidized satin bronze, oil rubbed, over bronze base metal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: Comply with DHI A115 series.
 1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.
- B. Wood Doors: Comply with DHI A115-W series.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 2. Wood Doors: as noted on the drawings.
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Key Control System: Place keys on markers and hooks in key control system cabinet, as determined by final keying schedule.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
1. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
 2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
 3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.
- 3.8 DOOR HARDWARE SCHEDULE - to be selected by Architect for new doors to match existing. Existing historic transom operators to be reused - non operable.

END OF SECTION 08711

SECTION 08800 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes glazing for the following products:

1. Type A: flat, clear double strength glass
2. Type B: flat, clear insulating glass
3. Type C: flat, patterned glass
4. Type D: flat, clear, laminated, fire rated ceramic glass
5. Type E: flat, clear, fire rated ceramic glass
6. UV blocking film to apply on designated existing windows

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

- B. UV Blocking film shall block 98% of UV radiation.

1.4 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each glass product and glazing material indicated.
- C. Samples for verification purposes of 12-inch-square samples of each type of glass indicated.
- D. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.
- E. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

1.5 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more

stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

- 1.FGMA Publications: "FGMA Glazing Manual."
 - 2.LSGA Publications: "LSGA Design Guide."
 - 3.SIGMA Publications: TM-3000 "Vertical Glazing Guidelines".
- B. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.
1. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.
- C. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.
- D. Single-Source Responsibility for Glass: Obtain glass from one source for each product.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Install liquid sealants at ambient and substrate temperatures above 40 deg F (4.4 deg C).

PART 2 - PRODUCTS

2.1 GLASS MANUFACTURERS

- A. Flat clear double strength glass.
- 1.PPG Industries, Inc.
 - 2.Pilkington Building Products
 - 3.AFGD Glass
- B. Flat insulating glass: Type B1 $\frac{1}{4}$ " thick, Type B2: $\frac{5}{8}$ " thick and tempered.
- 1.PPG Industries, Inc.

2.Pilkington Building Products
3.AFGD Glass

C. Flat obscure glass, 3/16" thick "Silesia Pattern"

- 1.S.A. Bendheim (212) 226-6370 X19
- 2.Klahr Glass Co. (914) 946-1550
- 3.Hollander Glass East, Inc. 1-800-221-6207 (Specified)

D. Flat, clear laminated fire rated ceramic glass - Type "I"

- 1.5/16" thick Firelite Plus by technical Glass Products, Inc.
1-800-426-0279.
- 2.1/4" thick Superlite I by Safety and Fire technology, Inc.
1-800-822-2088.

E. Flat, clear, fire rated ceramic glass - Type "J"

- 1.3/16" thick Firelite by Technical Glass Products, Inc.
1-800-426-0279.

2.2 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

- 1.Compatibility: Select glazing sealants of proven compatibility with other materials they will contact, including glass products, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
- 2.Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants that are suitable for applications indicated and conditions existing at time of installation.

B. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements.

2.3 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

2.4 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and

surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

- 2.5 UV BLOCKING FILM: "Waterwhite" by MSC Specialty Films, Inc., 1-800-282-9031, 4 mil thickness, clear adhesive sheet product.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine glass framing, with glazier present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
 2. Minimum required face or edge clearances.
 3. Effective sealing between joints of glass-framing members.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass from edge damage during handling and installation as follows:
 1. Use a rolling block in rotating glass units to prevent damage to glass corners. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
 2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.

3.4 SEALANT GLAZING (WET)

- A. Install glazier's points between glass lites and glazing stops to maintain glass face clearances. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 UV BLOCKING FILM

- A. Furnish and install uv blocking film at existing windows designated on the drawings. Apply film in accordance with manufacturer's installation instructions. Apply film from edge to edge of wood sash members so that edges of film are not visible and surface of film is smooth and uninterrupted.

3.5 PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

E. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION 08800

SECTION 09200 - LATH AND PLASTER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes plaster for areas of new construction existing partitions without wood lath and areas of new ceilings, the following:

1. Metal lath on interior masonry walls.
2. Plastering, consisting of lath, brown coat, and white coat.
3. Thin-coat plaster.
4. Two plaster ceiling medallions.

Existing plaster has been removed from the passenger building. All existing interior walls to receive plaster shall be covered with metal lath and secured prior to plaster work.

- B. Quality of Workmanship: All work to be performed under this section shall be done by craftsmen and artisans skilled in required trades to produce a first class installation. All work shall be executed in strict accordance with manufacturer's recommendations.

- C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 6 Section "Rough Carpentry" for wood framing and furring.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data consisting of manufacturer's product specifications and installation instructions for each product, including data showing compliance with specified requirements.
- C. Material Certificates: Submit certificate signed by manufacturer for each kind of plaster aggregate certifying that materials comply with requirements.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain gypsum lath and gypsum plaster from one source and by a single manufacturer.
- B. Fire-Test-Response Characteristics: Where fire-resistance-rated plaster assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Coordination of Work: Coordinate layout and installation of suspension system components with other work supported by or penetrating through ceiling.
- D. Mockups: Prior to installing plaster work, construct panels for each type of finish and application required to verify selections made under Sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
 - 1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Erect mockups 48 by 48 inches (1200 by 1200 mm) by full thickness in presence of Architect using materials, including lath, support system, and control joints indicated for final Work.
 - 3. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.
 - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 5. Obtain Architect's approval of mockups before plastering.
 - 6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed plaster Work.
 - a. When directed, remove mockups from Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.
- B. Store materials inside, under cover, and dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.
- B. Cold-Weather Requirements: When ambient outdoor temperatures are below 40 deg F (4 deg C), maintain continuous uniform temperature of not less than 40 deg F (4 deg C) nor more than 80 deg F (27 deg C) for at least 7 days before beginning plaster application, during its application, and until plaster is dry but for at least 7 days after application is complete. Distribute heat evenly; prevent concentrated or uneven heat from contacting plaster near heat source.
- C. Ventilation: Ventilate building spaces as required to remove water in excess of that required for hydrating plaster. Begin ventilation immediately after plaster is applied and continue until it sets.
- D. Protect contiguous work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Expanded-Metal Lath:

- a. Alabama Metal Industries Corp. (AMICO).
- b. California Expanded Metal Products Co.
- c. Dale//Incor Industries, Inc.
- d. Dietrich Industries, Inc.
- e. National Gypsum Co.
- f. Unimast, Inc.
- g. United States Gypsum Co.
- h. Western Metal Lath Co.

2. Metal Accessories:

- a. Alabama Metal Industries Corp. (AMICO).
- b. California Expanded Metal Products Co.
- c. Dale//Incor Industries, Inc.
- d. Delta Star, Inc.
- e. Flannery, Inc.
- f. Fry Reglet Corporation.
- g. Gordon, Inc.
- h. Metalex (Keene Products).
- i. MM Systems Corp.
- j. National Gypsum Co.
- k. Pittcon Industries.
- l. Unimast, Inc.
- m. United States Gypsum Co.
- n. Western Metal Lath Co.

3. Bond Coat Products

- a. U.S. Gypsum "Plaster Bonder"

4. Lath and Plasters:

- a. National Gypsum Co.
- b. United States Gypsum Co.
- c. Gold Bond Building Products Div.

2.2 LATH

A. Expanded-Metal Lath: Fabricate expanded-metal lath from uncoated or zinc-coated (galvanized) steel sheet to produce lath complying with ASTM C 847 for type, configuration, and other characteristics indicated below, with uncoated steel sheet coated after fabrication into lath.

1. Diamond-Mesh Lath: Comply with the following requirements:

- a. Configuration: Flat.

1) Weight: 2.5 lb/sq. yd. (1.4 kg/sq. m).

- b. Configuration: Self-furring.

1) Weight: 2.5 lb/sq. yd. (1.4 kg/sq. m).

2.3 PLASTER

A. Basecoat Plasters, for application on wood lath or masonry
Mix lime putty, 1:3, with sand, for the scratch coat, well haired
Mix lime putty, 1:2.0-2.5, with sand, for the float coat, haired
OR: formulate according to mortar analysis or volumetric test

B. Finish coat Plasters or small area, crack repair

Mix lime putty, 1:1, with graded sand, for the finish coat,
OR; Mix lime putty, 3:1, with gauging plaster

OR; Mix according to the mortar analysis or volumetric test

C. Gauging Plaster

USG Champion Quality Gauging Plaster or equal

D. Lime

Lime putty that has emley plasticity greater than 400, 98% or better calcium, and a high surface area of 30m²/gram or better. Lime putty matching these specifications is available from Traditional & Sustainable Building, www.traditionalandsustainable.com at 443-822-0983,

E. Sand

Sand shall be well graded, masons, and shall be clean and free of dirt, and organic substances. Or match the existing historic sand as determined by the CO and/or the mortar analysis.

F. Fiber for Scratch and Float coats

The allowable fibers are as determined by mortar analysis or as follows in order of priority, hemp, goat hair, cattle hair, hog hair,

SECTION 09200

LATH AND PLASTER

jute, sisal, or manila. The fiber should be 1" to 1/2", in length. It shall be added in the proportion of 1/2 pound of fiber to 2.25 cubic feet of coarse stuff.

G. Water shall be clean, fresh, potable, and free from organic substances.

H. Bonding agents will **not** to be used without specific permission of the Architect.

2.4 ACCESSORIES

2.4.1.1.1 General: Comply with material provisions of ASTM C 841 and the requirements indicated below; coordinate depth of accessories with thicknesses and number of plaster coats required.

2.4.1.1.1.1 Galvanized Steel Components: Fabricated from zinc-coated (galvanized) steel sheet complying with ASTM A 653, G40 (ASTM A 653M, Z90) minimum coating designation.

2.4.1.1.1.2 Metal Cornerbeads: Type as indicated below, fabricated from zinc-coated (galvanized) steel.

2.4.1.1.1.2.1 Type: Small nose with expanded flanges, unless otherwise indicated.

2.4.1.1.1.2.2 Type: Small nose with perforated flanges, for use on curved corners.

2.4.1.1.1.3 Strip Reinforcement: Smooth-edge strips of expanded-metal lath fabricated from uncoated or zinc-coated (galvanized) steel sheet, with uncoated steel sheet coated after fabrication; in the following forms:

2.4.1.1.1.3.1 Cornerite: Strips bent lengthwise in center for internal plaster angles not otherwise reinforced by metal lath lapped or carried around.

2.4.1.1.1.4 Casing Beads: Square-edged style, with short or expanded flanges to suit kinds of plaster bases indicated; of the following material:

2.4.1.1.1.4.1 Material: Zinc-coated (galvanized) steel.

2.4.1.1.1.5 Curved Casing Beads: Square-edged style, fabricated from aluminum coated with clear plastic, preformed into curve of radius indicated.

2.4.1.1.1.6 Control Joints: Prefabricated, of material and type indicated below:

2.4.1.1.1.6.1 Material: Zinc-coated (galvanized) steel.

2.4.1.1.1.6.2 One-Piece Type: Folded pair of nonperforated screeds in M-shaped configuration, with expanded or perforated flanges.

2.4.1.2 MISCELLANEOUS MATERIALS

SECTION 09200

LATH AND PLASTER

2.4.1.2.1 Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

2.4.1.2.2 Bonding Compound: ASTM C 631.

2.4.1.2.3 Steel drill screws complying with ASTM C 1002 for fastening metal or gypsum lath to wood or steel members less than 0.033 inch (0.84 mm) thick.

2.4.1.3 ACOUSTICAL SEALANT

2.4.1.3.1 Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

2.4.1.3.1.1 Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

2.4.1.3.2 Products: Subject to compliance with requirements, provide one of the following:

2.4.1.3.2.1 Acoustical Sealant for Exposed and Concealed Joints:

2.4.1.3.2.1.1 PL Acoustical Sealant; ChemRex, Inc., Contech Brands.

2.4.1.3.2.1.2 AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.

2.4.1.3.2.1.3 SHEETROCK Acoustical Sealant; United States Gypsum Co.

2.4.1.3.3 Sand Aggregates for Base-Coat Plasters: ASTM C 897, type as indicated below:

2.4.1.3.3.1 Sand aggregate, unless otherwise indicated match existing finish texture.

2.4.1.3.4 Aggregates for Finish-Coat Plaster with Floated Finish: ASTM C 35; graded per ASTM C 842, type as indicated below:

2.4.1.3.4.1 Sand aggregate, match texture of existing finish.

2.4.1.3.5

2.4.1.3.6 Miscellaneous Materials:

2.4.1.3.6.1 Water for mixing and finishing plaster: Drinkable and free of substances capable of affecting plaster set or of damaging plaster lath or accessories.

2.4.1.3.6.2

2.4.1.3.6.3 Acoustical Sealant: ASTM C 919, nonoxidizing, skinning paintable types for exposed applications; nondrying, nonhardening, nonstaining, nonbleeding, gunnable-type sealant complying with requirement specified in Division 7 Section "Joint Sealers" for concealed applications.

2.4.1.4 MIXING

SECTION 09200

LATH AND PLASTER

2.4.1.4.1 Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

3 EXECUTION

3.3.1.1 Existing conditions: Contractor shall carefully examine all areas to receive new plaster work and all existing plaster surfaces and bring attention of Architect those areas of existing plaster in substandard condition for unit price consideration. Areas of new paste work shall be prepared as necessary to receive new work; including removal/modification of all damaged plaster/lath and removal/replacement of substrates in poor condition. All interior masonry walls to receive plaster shall be covered with metal lath and secured prior to plaster work.

3.3.1.2 INSTALLATION OF LATH AND FURRING, GENERAL

3.3.1.2.1 Interior Lathing and Furring: Install materials indicated for plaster to comply with ASTM C 1063.

3.3.1.2.2 Install supplementary framing, blocking, and bracing at terminations in Work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable written instructions of plaster manufacturer or, if not available, of USG's "Gypsum Construction Handbook."

3.3.1.2.3 Isolation: Where lathing and metal support system abuts building structure horizontally and where partition or wall abuts overhead structure, sufficiently isolate from structural movement to prevent transfer of loading from building structure. Install slip- or cushion-type joints to absorb deflections but maintain lateral support.

3.3.1.2.3.1 Frame both sides of control joints independently and do not bridge joints with furring and lathing or accessories.

3.3.1.3 METAL LATHING

3.3.1.3.1 Install expanded-metal lath for the following applications where plaster base coats are required. Provide appropriate type, configuration, and weight of metal lath selected from materials indicated that comply with referenced lathing installation standards.

3.3.1.3.1.1 Vertical metal framing and furring using 3.4-lb/sq. yd. (1.8-kg/sq. m) minimum weight, diamond-mesh lath and cold-rolled channel stud framing.

3.3.1.4 INSTALLATION OF PLASTERING ACCESSORIES

SECTION 09200**LATH AND PLASTER**

3.3.1.4.1 General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and in alignment during plastering.

3.3.1.4.2 Accessories: Provide the following types to comply with requirements indicated for location:

3.3.1.4.2.1 Cornerbeads: Install at external corners.

3.3.1.4.2.2 Casing Beads: Install at terminations of plaster work, except where plaster passes behind and is concealed by other work and where metal screeds, bases, or frames act as casing beads.

3.3.1.4.2.2.1 Control Joints: Install at locations indicated or, if not indicated, at spacings and locations required by referenced standard, recommended by plaster manufacturer, and approved by Architect.

3.4 PLASTER BONDING AGENT APPLICATION

A. Apply plaster bonding agent in strict accordance with manufacturer's recommendations. Follow manufacturer's safety instructions for application, storage of materials, and clean-up.

B. Prepare surfaces to receive plaster bonding agent by removing all loose plaster, dust, dirt, oil, grease, wax, loose paint, mildew, rust, and efflorescence. Dull smooth substrate surfaces with a wire brush. Protect existing adjacent finished surfaces from contact with bonding agent using products developed for use during plastering operations.

C. Apply bonding agent in well ventilated areas and apply full strength without dilution. Hand stir prior to application but avoid entrapping air bubbles in solution. Apply with brush or roller. Spray application is not permitted. Allow to dry one hour or until surface is dry to the touch. Before plastering, inspect surface to ensure a continuous film of bonding agent throughout. Reapply bonding agent to areas not sufficiently covered. Plastering may begin as soon as surface is dry.

3.5 PLASTER APPLICATION, GENERAL

A. Prepare monolithic surfaces for bonded base coats and use bonding compound to comply with requirements of referenced plaster application standards for conditioning monolithic surfaces.

3.3.1.4.3 All ingredients to be mixed by mechanical mixers. Measurements of ingredients to be volume or weight measure. Shovel count shall not be permitted. Mixers to be cleaned of all set/hard material before materials for new batch are loaded. Each batch to be mixed separately, not less than 2 minutes or more than 7 minutes, depending on speed of mixer. No more material to be mixed that can be used in 1 hour. Mixers to be equipped with rubber tipped blades to prevent partially set material from accumulating in barrel of mixer.

Materials to be proportioned as specified here with such variations only as will, under prevailing conditions, improve quality of work and be approved by Architects. All undercoats of plaster to be moistened to secure proper spreading/adhesion of plaster when applied. Screeds to be run on all surfaces at such intervals to establish exact surface of brown coat and serve as guides for rodding where grounds for finish are not available.

All plaster on metal lath to be 3-coat work; scratch coat to be applied with sufficient material/pressure to form good full keys with metal lath and then cross-scratched to rough surface; brown coat to be applied after scratch coat as set firm/hard brought out to grounds and straightened to true surface with rod/darby and left rough, ready to receive finish; finish coat to cover rough plaster so completely that no part of undercoat shall show through, trowelled to dense close-grained surface with high polish. Finish work to be true to grounds/guidelines and be straight/level/plumb with true surfaces and sharp lines/arises. Finished work to show no visible joints/cracks/tool marks/discolorations and smooth and continuous with existing finish coats.

Overall thickness of lath/plaster to match the existing plaster in the area of new plaster, whether lower first period of construction or the upper level rear addition plaster.

3.3.1.4.4 Grout hollow-metal frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, before lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout at least 6 inches (152 mm) at each jamb anchor.

3.3.1.4.5 Sequence plaster application with installation and protection of other work so that neither will be damaged by installation of other.

3.3.1.4.6 Plaster flush with grounds or other built-in items or accessories that act as a plaster ground, unless otherwise indicated. Apply thicknesses and number of coats of plaster as indicated or as required by referenced standards.

3.3.1.4.7 Concealed Plaster: Where plaster application will be concealed by wood paneling, above suspended ceilings and in similar locations, finish coat may be omitted; where concealed behind cabinets, similar furnishings, and equipment, apply finish coat; where used as a base for adhesive application of tile and similar finishes, omit finish coat, coordinate thickness with overall dimension as shown, and comply with tolerances specified.

3.3.1.4.8 Apply bonding agent to existing plaster brown coat after existing loose finish plaster has been removed by sounding and new bonding agent has been applied.

3.6 PLASTER APPLICATION

- A. Plaster Application Standard: Apply plaster materials, composition, mixes, and finishes indicated to comply with ASTM C 926.
- B. Number of Coats: Apply plaster of composition indicated, to comply with the following requirements:

3.3.1.4.8.1 Three Coats: Over the following plaster bases:

3.3.1.4.8.1.1 Metal lath.

3.3.1.4.8.1.2 Existing wood lath with bonding agent.

3.3.1.4.8.2 Two Coats: Over the following bases:

a. Existing brown/scratch coats with new bonding agent.

3.3.1.4.9 Finish Coats: Apply finish coats to comply with the following requirements:

3.3.1.4.9.1 Match existing.

3.7 CUTTING AND PATCHING

- A. Cut, patch, replace, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.
- B. Sand smooth-troweled finishes lightly to remove trowel marks and arises. Leave plaster ready for painting.

3.8 CLEANING AND PROTECTING

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering. When plastering is completed, remove unused materials, containers, and equipment and clean floors of plaster debris.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure plaster work is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09200

SECTION 09255 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Gypsum board ceiling assemblies attached to wood framing.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 6 Section "Rough Carpentry" for wood framing and furring, and gypsum sheathing applied over wood framing.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 ASSEMBLY PERFORMANCE REQUIREMENTS

A. Fire Resistance: Provide gypsum board assemblies with fire-resistance ratings indicated.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of product specified.

1.6 QUALITY ASSURANCE

A. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

B. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

C. Fire-Test-Response Characteristics: Where fire-resistance-rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:

1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

2. Gypsum board assemblies indicated are identical to assemblies tested for fire resistance according to ASTM E 119 by an independent testing and

inspecting agency acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.

1.8 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
- B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Gypsum Board and Related Products:

- a. Domtar Gypsum.
 - b. Georgia-Pacific Corp.
 - c. National Gypsum Co.; Gold Bond Building Products Division.
 - d. United States Gypsum Co.

2.2 GYPSUM BOARD PRODUCTS

- A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.

- 1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).

- B. Gypsum Wallboard: ASTM C 36 and as follows:

- 1. Type: Regular for vertical surfaces, unless otherwise indicated.
 - 2. Type: Type X where required for fire-resistance-rated assemblies.
 - 3. Type: Sag-resistant type for ceiling surfaces.
 - 4. Edges: Tapered.
 - 5. Thickness: 5/8 inch (12.7 mm), unless otherwise indicated.

2.3 CEMENTITIOUS BACKER UNITS

A. Provide cementitious backer units complying with ANSI A118.9, of thickness and width indicated below, and in maximum lengths available to minimize end-to-end butt joints.

1. Thickness: 1/2 inch (12.7 mm), unless otherwise indicated.
2. Width: 48 inches (1219 mm).

B. Products: Subject to compliance with requirements, provide one of the following products:

1. The Original Wonderboard; Custom Building Products.
2. Wonderboard Multi+Board; Custom Building Products.
3. DomCrete Cementitious Tile-Backer Board; Domtar Gypsum.
4. DUROCK Cement Board; United States Gypsum Co.

2.4 TRIM ACCESSORIES

A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal with metal complying with the following requirement:

a. Steel sheet zinc coated by hot-dip process or rolled zinc.

2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:

a. Cornerbead on outside corners, unless otherwise indicated.

b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.

c. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

B. Accessories for Exterior Installations: Cornerbead, edge trim, and control joints formed from steel sheet zinc coated by hot-dip process or rolled zinc complying with ASTM C 1047, in shapes indicated below by reference to Fig. 1 designations in ASTM C 1047.

1. Cornerbead on outside corners, unless otherwise indicated.

2. One-piece control joint formed from rolled zinc with V-shaped slot and removable strip covering slot opening.

2.5 JOINT TREATMENT MATERIALS

A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

1. Use pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

C. Joint Tape for Cementitious Backer Units: As recommended by cementitious backer unit manufacturer.

D. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer.
3. For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by gypsum board manufacturer.
4. For topping compound, use sandable formulation.

E. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.

1. Ready-Mixed Formulation: Factory-mixed product.
 - a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
 - b. Topping compound formulated for fill (second) and finish (third) coats.
 - c. All-purpose compound formulated for both taping and topping compounds.

F. Joint Compound for Cementitious Backer Units: Material recommended by cementitious backer unit manufacturer.

2.6 ACOUSTICAL SEALANT

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

C. Products: Subject to compliance with requirements, provide one of the following:

1. Acoustical Sealant for Exposed and Concealed Joints:

- a. PL Acoustical Sealant; ChemRex, Inc.; Contech Brands.
- b. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.
- c. SHEETROCK Acoustical Sealant; United States Gypsum Co.

2. Acoustical Sealant for Concealed Joints:

- a. BA-98; Pecora Corp.
- b. Tremco Acoustical Sealant; Tremco, Inc.

2.7 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.

C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.

D. Fastening Adhesive for Wood: ASTM C 557.

E. Gypsum Board Nails: ASTM C 514.

F. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.

G. Sound-Attenuation Blankets: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing). Blankets shall be 3-1/2" thick.

1. Mineral-Fiber Type: Fibers manufactured from glass, slag wool, or rock wool.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

B. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

F. Attach gypsum panels to framing provided at openings and cutouts.

G. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Instead, float gypsum panels over these members using resilient channels or provide control joints to counteract wood shrinkage.

H. Spot grout hollow metal door frames for solid-core wood doors, hollow metal doors, and doors over 32 inches (813 mm) wide. Apply spot grout at each

jamb anchor clip and immediately insert gypsum panels into frames.

I. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

J. Where noted on the drawings, cover both faces of stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.

1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

K. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

L. Floating Construction: Where feasible, including where recommended by manufacturer, install gypsum panels over wood framing, with floating internal corner construction.

M. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.

N. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.3 GYPSUM BOARD APPLICATION METHODS

A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.

2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.

B. Wall Tile Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, comply with the following:

1. Install cementitious backer units to comply with ANSI A108.11 at locations indicated to receive wall tile.

C. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and gypsum wallboard face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints. Stagger joints on opposite sides of partitions.

D. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:

1. Fasten to wood supports with single nailing or as required to ful fill

U.L. assembly
requirements

E.Multilayer Fastening Methods: Apply base layers of gypsum panels and face layer to base layers as follows:

1.Fasten base layers to wood supports with nails and face layer with adhesive and supplementary fasteners or as required to fulfill U.L. assembly requirements.

F.Direct-Bonding to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's recommendations, and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLING TRIM ACCESSORIES

A.General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B.Install cornerbead at external corners.

C.Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.

1.Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.

2.Install L-bead where edge trim can only be installed after gypsum panels are installed.

3.Install U-bead where indicated.

D.Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

3.5 FINISHING GYPSUM BOARD ASSEMBLIES

A.General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

B.Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.

C.Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.

D.Apply joint tape over gypsum board joints and to flanges of trim accessories as recommended by trim accessory manufacturer.

E.Levels of Gypsum Board Finish: Provide gypsum board finish per GA-214.

F.Finish cementitious backer units to comply with unit manufacturer's directions.

3.6 FIELD QUALITY CONTROL

A. Above-Ceiling Observation: Architect will conduct an above-ceiling observation prior to installation of gypsum board ceilings and report any deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

1. Notify Architect one week in advance of the date and the time when the Project, or part of the Project, will be ready for an above-ceiling observation.
2. Prior to notifying Architect, complete the following in areas to receive gypsum board ceilings:
 - a. Installation of 80 percent of lighting fixtures, powered for operation.
 - b. Installation, insulation, and leak and pressure testing of water piping systems.
 - c. Installation of air duct systems.
 - d. Installation of air devices.
 - e. Installation of mechanical system control air tubing.
 - f. Installation of ceiling support framing.

3.7 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09255

SECTION 09310 - CERAMIC TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1.Unglazed floor tile laid in standard patterns.
 - 2.Waterproof membrane for thin-set tile installations.

1.3 SUBMITTALS

- A. Product Data: For each type of tile, mortar, grout, and other products specified.
- B. Shop Drawings: For the following:
 - 1.Tile patterns and locations.
 - 2.Widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Tile Samples for Initial Selection: Manufacturer's color charts consisting of actual tiles or sections of tiles showing the full range of colors, textures, and patterns available for each type and composition of tile indicated. Include Samples of accessories involving color selection.
- D. Grout Samples for Initial Selection: Manufacturer's color charts consisting of actual sections of grout showing the full range of colors available for each type of grout indicated.
- E. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- F. Product Certificates: Signed by manufacturers certifying that the products furnished comply with requirements.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed tile installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source Limitations for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties without

delaying the Work.

- C. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- D. Source Limitations for Other Products: Obtain each of the following products specified in this Section from one source and by a single manufacturer for each product:
 - 1. Joint sealants.
 - 2. Waterproofing.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.
- B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.
- C. Handle tile with temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is completed and ambient temperature and humidity conditions are being maintained to comply with referenced standards and manufacturer's written instructions.

1.7 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Tile Products:
 - a. Buchtal Corporation USA.
 - b. Crossville Ceramics.

- c.Dal-Tile Corporation. (Specified)
- d.Florida Tile Industries, Inc.
- e.Mannington Ceramic Tile.
- f.Monarch Tile, Inc.
- g.Quarry Tile Company.
- h.Seneca Tiles, Inc.
- i.Summitville Tiles, Inc.

2.Tile-Setting and -Grouting Materials:

- a.Bonsal: W.R. Bonsal Company.
- b.Bostik.
- c.Dal-Tile Corporation.
- d.DAP, Inc.
- e.Laticrete International, Inc.
- f.Mapei Corporation.
- g.Summitville Tiles, Inc.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
 - 1.Provide tile complying with Standard Grade requirements, unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting Materials" and "Grouting Materials" articles.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 - 1.Provide Architect's selections from manufacturer's full range of colors, textures, and patterns for products of type indicated.
- D. Factory Blending: For tile exhibiting color variations within the ranges selected during Sample submittals, blend tile in the factory and package so tile units taken from one package show the same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: Where factory-mounted tile is required, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless another mounting method is indicated.

2.3 TILE PRODUCTS

- A. Unglazed mosaic Floor Tile: Provide factory-mounted flat tile complying with the following requirements:
 - 1.Composition: Ceramic.
 - 2.Module Size: 1" hexagon.
 - 3.Nominal Thickness: $\frac{3}{8}$ " inch (6.35 mm).

4.Face: Plain with cushion edges.

Colors: Color #1 to be white.

2.4 WATERPROOFING FOR THIN-SET TILE INSTALLATIONS

- A. General: Provide products that comply with ANSI A118.10 and the descriptions in this Article.
- B. Polyethylene-Sheet Waterproofing: Manufacturer's standard proprietary product consisting of composite sheets, 60 inches (152 mm) wide by a nominal thickness of 0.030 inches (0.76 mm), composed of an inner layer of nonplasticized, chlorinated polyethylene sheet faced on both sides with laminated, high-strength, nonwoven polyester material, designed for embedding in latex-portland cement mortar and as the substrate for latex-portland cement mortar setting bed.
- C. Products: Subject to compliance with requirements, provide one of the following:

1.Polyethylene-Sheet Waterproofing:

a.Nobleseal TS; Noble Company (The).

2.5 SETTING MATERIALS

- A. Latex-Portland Cement Mortar: ANSI A118.4, composed as follows:
 - 1.Prepakaged Dry-Mortar Mix: Factory-prepared mixture of portland cement; dry, redispersible, ethylene vinyl acetate additive; and other ingredients to which only water needs to be added at Project site.
 - a.For wall applications, provide nonsagging, latex-portland cement mortar complying with ANSI A118.4 for mortar of this type defined in Section F-2.1.2.
- B. Water-Cleanable, Tile-Setting Epoxy Adhesive: ANSI A118.3.
- C. Organic Adhesive: ANSI A136.1, Type I.

2.6 GROUTING MATERIALS

- A. Latex-Portland Cement Grout: ANSI A118.6 for materials described in Section H-2.4, composed as follows:
 - 1.Factory-Prepared, Dry-Grout Mixture: Factory-prepared mixture of portland cement; dry, redispersible, ethylene vinyl acetate additive; and other ingredients to produce the following:
 - a.Unsanded grout mixture for joints 1/8 inch (3.2 mm) and narrower.
 - b.Sanded grout mixture for joints 1/8 inch (3.2 mm) and wider.

2.7 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with

applicable requirements of Division 7 Section "Joint Sealants."

- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and temperature extremes.
- D. Products: Subject to compliance with requirements, provide one of the following:
 - 1. One-Part, Mildew-Resistant Silicone Sealants:
 - a. Dow Corning 786; Dow Corning Corporation.
 - b. Sanitary 1700; GE Silicones.
 - c. Pecora 898 Sanitary Silicone Sealant; Pecora Corp.
 - d. Rhodorsil 6B White; Rhone-Poulenc, Inc.
 - e. Tremsil 600 White; Tremco, Inc.

2.8 MISCELLANEOUS MATERIALS

- A. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.9 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 series of tile installation standards for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.

- 3.Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust latter in consultation with Architect.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds, and other substances that contain soap, wax, oil, or silicone and are incompatible with tile-setting materials by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
- B. Provide concrete substrates for tile floors installed with dry-set or latex-portland cement mortars that comply with flatness tolerances specified in referenced ANSI A108 series of tile installation standards for installations indicated.
 - 1.Use trowelable leveling and patching compounds per tile-setting material manufacturer's written instructions to fill cracks, holes, and depressions.
 - 2.Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within the ranges selected during Sample submittals, verify that tile has been blended in the factory and packaged so tile units taken from one package show the same range in colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 series of tile installation standards in "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile

cutting. Provide uniform joint widths, unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets the same width as joints within tile sheets so joints between sheets are not apparent in finished work.

F. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.

2. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealants."

G. Grout tile to comply with the requirements of the following tile installation standards:

1. For ceramic tile grouts (sand-portland cement, dry-set, commercial portland cement, and latex-portland cement grouts), comply with ANSI A108.10.

3.4 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with waterproofing manufacturer's written instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.
- B. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.5 FLOOR TILE INSTALLATION

- A. General: Install tile to comply with requirements in the Ceramic Tile Floor Installation Schedule, including those referencing TCA installation methods and ANSI A108 series of tile installation standards.
- B. Joint Widths: Install tile on floors with the following joint widths:
 - 1. Ceramic Mosaic Tile: 1/16 inch (1.6 mm).

3.6 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove latex-portland cement grout residue from tile as soon as possible.
 - 2. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to grout manufacturer. Trap and remove

coating to prevent it from clogging drains.

- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.
- C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure tile is without damage or deterioration at the time of Substantial Completion.
 - 1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
 - 2. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09310

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes surface preparation and field painting of the following:

- 1.Exposed exterior items and surfaces including but not limited to:
 - a. Project sign.
 - b. not used.
 - c. Wood doors frames.
 - d. Wood windows frames.
 - e. Wood trim.

2.Exposed interior items and surfaces not included in this contract.

3.Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

- B. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.

- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

- D. Related Sections include the following:

1. Division 6 Section "Exterior Architectural Woodwork" for shop priming exterior architectural woodwork.

1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

- 1.Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
- 2.Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
- 3.Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
- 4.Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
- 5.Full gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

1.4 SUBMITTALS

- A. Product Data: For each paint system specified. Include block fillers and primers.
1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
 3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated.
1. After color selection, the Architect will furnish color chips for surfaces to be coated.
- C. Samples for Verification: Of each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 2. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.
 3. Submit Samples on the following substrates for the Architect's review of color and texture only:
 - a. Concrete: Provide two 4-inch- (100-mm-) square samples for each color and finish.
 - b. Concrete Masonry: Provide two 4-by-8-inch (100-by-200-mm) samples of masonry, with mortar joint in the center, for each finish and color.
 - c. Painted Wood: Provide two 12-inch- (300-mm-) square samples of each color and material on hardboard.
 - d. Stained or Natural Wood: Provide two 4-by-8-inch (100-by-200-mm) samples of natural- or stained-wood finish on actual wood surfaces.
 - e. Ferrous Metal: Provide two 4-inch- (100-mm-) square samples of flat metal and two 8-inch- (200-mm-) long samples of solid metal for each color and finish.
- D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample of each type of coating and substrate required on the Project. Comply with procedures specified in PDCA P5. Duplicate finish of approved

prepared samples.

1. The Architect will select one surface to represent surfaces and conditions for each type of coating and substrate to be painted.

a. Wall Surfaces: Provide samples on at least 100sq. ft. (9sq. m) of wall surface.

b. Small Areas and Items: The Architect will designate an item or area as required.

2. After permanent lighting and other environmental services have been activated, apply coatings in this room or to each surface according to the Schedule or as specified. Provide required sheen, color, and texture on each surface.

a. After finishes are accepted, the Architect will use the room or surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from job-applied samples.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.7 PROJECT CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 deg F (7.2 and 35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.8 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the Owner.

1. Quantity: Furnish the Owner with extra paint materials in the quantities indicated below:

- a. Exterior, Flat Acrylic Paint: One case of each color applied.
- b. Exterior, Low-Luster Acrylic Finish: One case of each color applied.
- c. Interior, Flat Acrylic Paint: One case of each color applied.
- d. Interior, Low-Luster Acrylic Finish: One case of each color applied.
- e. Interior, Semigloss Acrylic Enamel: 2 gal. (7.57 L) of each color applied.
- f. Interior, Full-Gloss Alkyd Enamel: 1 gal. (3.785 L) of each color required.

2. Quantity: Furnish the Owner with an additional 5 percent, but not less than 1 gal. (3.785 L) or 1 case, as appropriate, of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products in the paint schedules.

B. Manufacturers Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:

- 1. Devoe & Raynolds Co. (Devoe).
- 2. Fuller-O'Brien Paints (Fuller).
- 3. Benjamin Moore & Co. (Moore).
- 4. PPG Industries, Inc. (PPG).
- 5. Pratt & Lambert, Inc. (P & L).
- 6. Sherwin-Williams Co. (S-W).

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: Provide color selections made by the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if approved by the architect.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
 - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in

- finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
- c. When transparent finish is required, backprime with spar varnish.
- d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
- e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery. Use a tinted varnish or sealer, not a clear coat.
4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
- a. Blast steel surfaces clean as approved by the architect.
- b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
- c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.
5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the schedules.
 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 3. Provide finish coats that are compatible with primers used.
 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired

protection.

5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.

7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.

10. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.

2. Omit primer on metal surfaces that have been shop primed and touchup painted.

3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush or roller, according to manufacturer's written instructions. Spray application of paint is not permitted on this project

1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.

2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

E. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:

1. The Owner may engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.

2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:

- a. Quantitative material analysis.
- b. Abrasion resistance.
- c. Apparent reflectivity.
- d. Flexibility.
- e. Washability.
- f. Absorption.
- g. Accelerated weathering.
- h. Dry opacity.
- i. Accelerated yellowness.
- j. Recoating.
- k. Skinning.
- l. Color retention.
- m. Alkali and mildew resistance.

3. The Owner may direct the Contractor to stop painting if test results show material being used does not comply with specified requirements. The Contractor shall remove noncomplying paint from the site, pay for testing, and repaint surfaces previously coated with the rejected paint. If necessary, the Contractor may be required to remove rejected paint from previously painted surfaces if, on repainting with specified paint, the 2 coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and

restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE

A. Smooth Wood: Provide the following finish systems over smooth wood siding and other smooth, exterior wood surfaces:

1. Low-luster, Acrylic-Enamel Finish: 2 finish coats over a primer.

a. Primer: Exterior, alkyd or latex, wood primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.5 mils (0.038 mm).

- 1) Devoe:1102 All-Weather Exterior Alkyd House Paint Primer.
- 2) Fuller:220-08 Exterior Latex Wood Primer.
- 3) Moore:Moorwhite Primer #100.
- 4) PPG:72-1 Sun-Proof Exterior House & Trim Wood Primer Flat--Latex.
- 5) P & L:S/D 1002 Suprime "2" Exterior Latex Wood Primer.

b. First and Second Coats: Low-luster, waterborne, exterior, acrylic enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.4 mils (0.061 mm).

- 1) Devoe:17XX Wonder-Shield Low-luster Exterior Acrylic Latex House and Trim Paint.
- 2) Fuller:664-XX Weather King II Low-luster House & Trim Paint.
- 3) Moore:MoorGlo Latex House & Trim Paint #096.
- 4) PPG:78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
- 5) P & L:Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

C. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:

1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a galvanized metal primer.

a. Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).

- 1) Devoe:8502/8520 Mirrolac-WB Interior/Exterior Waterborne Flat DTM Primer and Finish.
- 2) Fuller:621-05 Blox-Rust Latex Metal Primer.
- 3) Moore:IronClad Galvanized Metal Latex Primer #155.
- 4) PPG:90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.
- 5) P & L:Z/F 1003 Suprime "3" Interior/Exterior Latex Metal Primer.

b. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).

- 1) Devoe:17XX Wonder-Shield Semi-Gloss Exterior Acrylic Latex House and Trim Paint.
- 2) Fuller:664-XX Weather King II Semi-Gloss House & Trim Paint.
- 3) Moore:MoorGlo Latex House & Trim Paint #096.
- 4) PPG:78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
- 5) P & L:Z/F 3100 Series Aqua Royal Latex House & Trim Finish.

3.8 INTERIOR PAINT SCHEDULE

A. Existing Plaster: Provide the following new plaster surfaces:

1. Primer: Alkali-resistant, alkyd- or latex-based, interior primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).
 - 1) Devoe: 51701 Wonder-Prime Interior All-Purpose Latex Primer Sealer & Vapor Barrier.
 - 2) Fuller: 220-06 Interior Alkyd Wall Primer Sealer.
 - 3) Moore: Regal First Coat Interior Latex Primer & Underbody #216.
 - 4) PPG: 6-603 Speedhide Interior/Exterior Acrylic Latex Alkali Resistant Primer.
 - 5) P & L: Z/F 1001 Suprime "1" 100 Percent Acrylic Multi-Purpose Primer.
2. First and Second Coats: Low-luster (eggshell or satin), acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils (0.071 mm).
 - 1) Devoe: 34XX Wonder-Tones Interior Latex Eggshell Enamel.
 - 2) Fuller: 212-XX AA Enamel Interior Acrylic Latex Eggshell Enamel.
 - 3) Moore: Moore's Regal Aquavelvet #319.
 - 4) PPG: 89 Line Manor Hall Eggshell Latex Wall and Trim Enamel.
 - 5) P & L: Z/F 4000 Series Accolade Interior Velvet.

END OF SECTION 09900

**SECTION 10 14 00
SIGNS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following types of signs:

1. Dimensional letters.

1.3 SUBMITTALS

- A. Templates: Furnish full-size spacing templates for individually mounted dimensional letters and numbers.

- B. Samples: Provide the following samples of each sign component for initial selection of color, pattern and surface texture as required and for verification of compliance with requirements indicated.

1. Samples for verification of color, pattern, and texture selected and compliance with requirements indicated:

- a. Dimensional Letters: Provide full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay

PART 2 PRODUCTS

2.1 MANUFACTURERS

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

- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Manufacturers of Dimensional Letters:
 - a. Metal Arts – 1-800-237-8069.
 - b. Gemini – 1-800-270-3343.
 - c. ASI Signage Innovations – 1-800-274-7732

2.2 DIMENSIONAL LETTERS AND NUMBERS

- A. Cast aluminum letters. Produce characters with smooth, flat faces, sharp corners, and precisely formed lines and profiles, free from pits, scale, sand holes, or other defects. Comply with requirements indicated for finish, style, and size.
 1. Finish: Satin
 2. Color: Gold
 3. Letter Style: Custom font provided by Architect
 4. Letter Height: As indicated on drawings.
 5. Mounting: As indicated on drawings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Dimensional Letters: Mount letters using standard fastening methods recommended by the manufacturer for letter form, type of mounting, wall construction, and condition of exposure indicated.

END OF SECTION

SECTION 101410 - SPECIALTY SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Cast-metal plaques.
2. Gold Leaf letters on glazing.

- B. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for temporary project identification signs.
2. Division 15 Section "Mechanical Identification" for labels, tags, and nameplates for mechanical equipment.
3. Division 16 Section "Electrical Identification" for labels, tags, and nameplates for electrical equipment.
4. Division 16 Section "Interior Lighting" for illuminated exit signs.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details. Provide 2 full size rubbings of cast metal plaque, one for initial submittal and one follow-up incorporating any red-marked changes to initial submittal.
 1. Provide nomenclature for each sign, including large-scale details of wording, lettering, artwork, and braille layout.
- C. Samples for Initial Selection: For each type of sign material indicated that involves color selection.
- D. Samples for Verification: For each type of sign, include the following Samples to verify color selected:

1. Casting: Show representative texture, character style, spacing, finish, and method of attachment.
 2. Sample font for gold leaf applied letters.
 3. Approved samples will not be returned for installation into Project.
- E. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by signage manufacturer.
- B. Source Limitations: Obtain each sign type through one source from a single manufacturer.
- C. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 CAST-METAL PLAQUES

- A. General: Provide castings free from pits, scale, sand holes, and other defects. Comply with requirements specified for metal, border style, background texture, and finish and in required thickness, size, shape, and copy.

- B. Manufacturers:
 - 1. American Graphics Inc.
 - 2. Gemini Incorporated.
 - 3. Matthews International Corporation; Bronze Division.
- C. Bronze Castings: ASTM B 584, alloy UNS No. C83600 (No. 1 manganese bronze).
- D. Border Style: Raised flat band.
- E. Background Texture: Manufacturer's standard stipple finish.
- F. Mounting: Rosettes and fasteners matching plaque finish for substrates encountered.
- G. Provide (1) 20" x 30" Cast Metal Dedication Plaque and (1) 14" x 18" Cast Metal Historic Registry Plaque.
- H. Provide (4) 6" x 8" Interior Panel Signs, High-Pressure Laminate 0.048 inch thick with Tactile and Braille text and symbols complying with ICC/ANSI A117.1.

2.3 GOLD LEAF APPLIED LETTERS

- A. General: Use xx deep glass gold leaf.
- B. Location: Gold Leaf Letters are to be applied to Ticket Office windows W31 at two locations.
- C. Manufacturers: NEI Group (323-469-0856) or other approved manufacturer.

2.4 ACCESSORIES

- A. Mounting Methods: Use concealed fasteners.
- B. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.

2.6 COPPER-ALLOY FINISHES

- A. Brass Character Finishes: Polished with exposed surfaces free from porosity, burrs, and rough spots; with returns finished with fine-grain air blast.
- B. Cast-Bronze Plaque Finishes: Exposed surfaces free from porosity, burrs, and rough spots; with returns finished with fine-grain air blast.
 - 1. Raised Areas: Hand-tool and buff borders and raised copy to produce manufacturer's standard satin finish.
 - 2. Background Finish: Dark oxidized.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
- B. Dimensional Characters: Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
 - 1. Flush Mounting: Mount characters with backs in contact with wall surface.
 - 2. Projected Mounting: Mount characters at projection distance from wall surface indicated.

C. Cast-Metal Plaques: Mount plaques using standard fastening methods recommended in writing by manufacturer for type of wall surface indicated.

1. Face Mounting: Mount plaques using exposed fasteners with rosettes attached through face of plaque into wall surface.

E. Gold Leaf letters: Install plumb and true onto existing transom locations. Follow instructions in "A Guide to Genuine Gold Leaf Application" published by M. Swift and Sons, Inc., Hartford, CT.

3.3 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION

SECTION 10522 - FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 1. Surface mounted fire extinguishers on brackets.

1.3 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data fro fire extinguishers and brackets.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain fire extinguishes from a single manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1.J.L. Industries. (specified)
 - 2.Larsen's Manufacturing Co.
 - 3.Potter-Roemer, Inc.

2.2 EXTINGUISHERS

- A. Fire Extinghisher: Cosmic IOE, ABC type, by J. L. Industries or approved equal. One per F. E. cabinet. Use same extinguisher where bracket mounted.
- B. Bracket: J. L. Industries #846

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow manufacturer's printed instructions for installation.
- B. Install in locations as directed by the local fire marshal.

END OF SECTION 10522

**SECTION 12 93 00
SITE FURNISHINGS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. The general provisions of the Contract, including General and Supplementary Conditions and Division 1-General Requirements Section apply to the work specified in this section.

1.2 DESCRIPTION OF WORK:

- A. This shall involve supplying and installing precast concrete benches and metal bike racks/loops as listed below:
 1. Curved Precast Concrete Bench (9 required)
 2. Straight Precast Concrete Bench (1 required)

1.3 QUALITY ASSURANCE:

- A. Manufacturer's Specifications: The products listed herein by manufacturer's name are only to list the minimum acceptable standards for each item. The A/E will consider approved equal materials provided they meet the minimum qualifications set forth by each listed product. The manufacturer's specs are for comparison purposes, only.
- B. All contractor furnished products of the same type will be from the same manufacturer.

1.4 SUBMITTALS

- A. For approval by Owner and A/E, submit specifications supplied by the manufacturer as recommended in Section – Submittal Procedures.

1.5 JOB CONDITIONS:

- A. Check the site for locations of equipment to insure that all items can be installed as planned. Notify A/E of any conditions that would prevent a successful installation.

PART 2 PRODUCTS

The following site furnishings are acceptable:

2.1 PRECAST CONCRETE BENCHES

- A. Curved Precast Concrete Bench

1. Modular reinforced cast stone (concrete) bench with extruded shape, solid, 28"d x 18"h x 114"w. Integral colored concrete, color: Grey. Reinforced with steel bar framework.
2. Manufacturers:
 - a. Basis of Design: Landscape Forms, 431 Lawndale Avenue, Kalamazoo, MI 49048, tel: 800-430-6209, web: www.landscapeforms.com. Model: Hebi
 - b. Wausau Tile, Inc., P.O. Box 1520, Wausau, WI 54402-1520, tel: 800-388-8728, web: www.wausautile.com
 - c. Quick Crete Products Corp., 731 Parkridge Avenue, Norco, CA 92860, tel: 866-703-3434, web: www.quickcrete.com
 - d. Approved Equal.

B. Straight Precast Concrete Bench

1. Modular reinforced cast stone (concrete) bench with extruded shape, solid, 28"d x 18"h x 114"w. Integral colored concrete, color: Grey. Reinforced with steel bar framework.
2. Manufacturers:
 - a. Basis of Design: Landscape Forms, 431 Lawndale Avenue, Kalamazoo, MI 49048, tel: 800-430-6209, web: www.landscapeforms.com. Model: Hebi
 - b. Wausau Tile, Inc., P.O. Box 1520, Wausau, WI 54402-1520, tel: 800-388-8728, web: www.wausautile.com
 - c. Quick Crete Products Corp., 731 Parkridge Avenue, Norco, CA 92860, tel: 866-703-3434, web: www.quickcrete.com
 - d. Approved Equal.

PART 3 EXECUTION

3.1 GENERAL

- A. Install all pre-manufactured items as specified in factory supplied instructions.
- B. Contractor shall order far enough in advance to prevent job delay for non-delivery of items.
- C. If applicable, set site furniture by permanent surface mounting method as recommended in manufacturer's literature.

3.2 BENCHES

- A. Freestanding.

3.3 PROTECTION

- A. Protect finishes of Site Furnishings from damage during construction period with temporary protective coverings approved by manufacturer. Remove protective coverings at the time of Substantial Completion.

- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field; make required alterations and refinish entire unit, or provide new units.

END OF SECTION

**SECTION 15010
BASIC MECHANICAL REQUIREMENTS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes Basic Mechanical Requirements applicable to all Division 15 Sections.

1.2 PRODUCTS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. Provide interchangeable components of the same manufacture for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

- H. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 SUBMITTAL PROCEDURES

- A. Division 1 – Submittal Procedures.
- B. Identify project, contractor, subcontractor, supplier, and specification section number.
- C. Apply contractor's stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the work and Contract Documents.
- D. Schedule submittals to expedite the project and deliver to Architect/Engineer at business address. Coordinate submission of related items.

1.6 SHOP DRAWINGS

- A. Submit the number of opaque reproductions which the Contractor requires, plus two copies which will be retained by the Architect/Engineer.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.7 PRODUCT DATA

- A. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Architect/Engineer.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this project.
- C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.8 MANUFACTURER INSTALLATION INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing to Architect/Engineer in quantities specified for product data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.9 MANUFACTURER CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer to Architect/Engineer in quantities specified for product data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect/Engineer.

1.10 REGULATORY REQUIREMENTS

- A. Conform to:
 - 1. The Virginia Uniform Statewide Building Code including referenced codes and standards.
 - 2. Industry Standards, Codes and Specifications:
 - a. ANSI: American National Standards Institute.
 - b. ARI: Air-Conditioning and Refrigeration Institute.
 - c. ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers.
 - d. ASME: American Society of Mechanical Engineers.
 - e. ASTM: American Society for Testing and Materials.
 - f. AWS: American Welding Society.
 - g. AWWA: American Water Works Association.
 - h. CISPI: Cast Iron Soil Pipe Institute.
 - i. ICC: International Code Council, Inc.
 - j. MSS: Manufacturers Standardization Society of the Valve & Fittings Industry, Inc.
 - k. NAIMA: North American Insulation Manufacturers Association.
 - l. NBS: National Bureau of Standards.
 - m. NFPA: National Fire Protection Association.
 - n. SMACNA: Sheet Metal and Air Conditioning Contractors.
 - o. UL: Underwriters Laboratories, Inc.
 - p. USASI: United States of America Standards Institute.
 - q. VDOT: Virginia Department of Transportation.
- B. Obtain permits and request inspections from authority having jurisdiction.

1.11 PROJECT/SITE CONDITIONS

- A. Install work in locations shown on drawings, unless prevented by project conditions. The drawings show the general arrangement of all piping, ductwork, equipment and appurtenances and shall be followed as closely as actual building construction and the work of other trades will permit. The work shall conform to the requirements shown on all of the drawings. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall investigate the structural and finish conditions affecting the work and shall arrange his work accordingly, providing such fittings, valves, offsets, transitions and other accessories as may be required to meet such conditions.

- B. Prepare drawings showing proposed re-arrangement of work to meet project conditions, including changes to work specified in other Sections. Obtain permission of Architect/Engineer before proceeding.

1.12 PAINTING

- A. Mechanical equipment, related piping, ductwork and materials do not require painting except as indicated below.
- B. Painting is not required for equipment having a factory applied finish except touch-up with matching finish where factory finish is damaged.
- C. Piping (except insulated and jacketed piping), fabricated supports, and any unfinished or unprotected materials located outdoors shall be painted with a suitable primer and compatible finish paint. Color shall be as directed by Architect/Engineer.
- D. Paint inside of ductwork with matte black paint where visible behind air inlets and outlets.
- E. Protection of work: Painting shall be done with care to protect work and work of other trades. All damage caused by the painting operations shall be corrected, repaired and cleaned as required. Hardware, special control items, gages, thermometers, nameplates, instrument glass and other similar items shall be removed or properly protected during the painting operation to ensure that these items are not covered or splattered with paint.

1.13 ELECTRICAL PROVISIONS

- A. Low voltage (less than 100 volts) control wiring and connections for equipment specified in Division 15 shall be provided under Division 15. All line voltage (100 volts and greater) field control wiring and connections for equipment furnished under Division 15, all power wiring, and all related electric supply and disconnecting equipment and wiring shall be provided on electrical drawings. Line voltage field wiring for equipment furnished under Division 15 shall be accomplished under the supervision of the Division 15 subcontractor.

1.14 WARRANTY

- A. All materials and workmanship shall be warranted to be free from defects for a period of one (1) year from date of acceptance and Contractor shall make good, without additional cost to the Owner, any defects which may appear within that period. Manufacturer's warranties extending beyond one year shall be processed and turned over to the Owner.

1.15 CLOSEOUT PROCEDURES: FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

- C. Replace filters of operating equipment.
- D. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.16 CLOSEOUT PROCEDURES: PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents; record actual revisions to the work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
 - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work.
 - 3. Field changes of dimension and detail.
 - 4. Details not on original Contract drawings.
- G. Remove Architect/Engineer title block and seal from all documents.
- H. Submit documents to Architect/Engineer.

1.17 CLOSEOUT PROCEDURES: OPERATION AND MAINTENANCE MANUALS

- A. Division 1 – Execution Requirements.
- B. Submit data on 8-1/2 x 11 inch text pages, bound in three ring binders with durable plastic or cloth covers.
- C. Prepare binder cover with printed title "Operation and Maintenance Instructions", title or project, and subject matter of binder when multiple binders are required.

- D. Internally subdivide the binder contents with permanent page dividers, logically organized, with minimum content as described below.
- E. Contents:
 - 1. Name of manufacturer.
 - 2. Name, address and telephone number of nearest manufacturer's representative.
 - 3. Copy of latest approved submittal including all review comments.
 - 4. Manufacturer's installation, operation and maintenance instructions including lubrication data.
 - 5. Parts numbers for all replaceable items.
 - 6. Serial numbers of all principal items of equipment.
 - 7. Control diagrams and sequence of operation.
 - 8. Manufacturer's written warranties that extend beyond the Contractor's one year warranty.
- F. Submit one draft copy of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned with Architect/Engineer comments. Revise content of all document sets as required prior to final submission.
- G. Submit two sets of revised final volumes within ten days after final inspection.

1.18 CLOSEOUT PROCEDURES: WARRANTIES

- A. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.
- B. Provide table of contents and assemble in binder with durable plastic or cloth cover.
- C. Submit prior to final application for payment.
- D. For items of work delayed beyond date of substantial completion, provide updated submittal with ten days after acceptance, listing date of acceptance as start of warranty period.

1.19 CLOSEOUT PROCEDURES: SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.
- B. Deliver to project site and place in location as directed; obtain receipt prior to final payment.

PART 2 PRODUCTS

2.1 EQUIPMENT AND MATERIALS

- A. Dimensions: The Contractor shall verify that items to be furnished fit the space available. He shall make field measurements to ascertain space requirements,

- including those for connections and maintenance, and shall furnish and install such sizes and shapes of equipment that the final installation shall suit the true intent and meaning of the drawings and specifications. Should he conclude that there is insufficient space for installation of specified materials, he shall immediately notify the Architect/Engineer of the conflict and shall stop affected work until he receives instructions as to how to proceed from the Architect/Engineer.
- B. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- C. Trade name and catalog numbers shall be interpreted as establishing a general design and standard of quality and shall not be construed as limiting competition
- D. When substitution of equipment or materials requires changes or revisions to the arrangement, layout or design of any system, drawings showing these changes or revisions shall be submitted for review, along with other required submittal data. The costs of all such changes and revisions shall be borne by the Contractor.
- E. Similar items shall be provided by a single manufacturer.

2.2 EQUIPMENT ACCESSORIES

- A. The Contractor shall furnish and install all equipment, accessories, connections and incidental items necessary to fully complete the work ready for use, occupancy and operation by the Owner.
- B. Equipment or Connections Different from that Shown: Where equipment requiring different arrangement of connections from those shown is proposed by the Contractor, and is acceptable to the Architect/Engineer, it shall be the responsibility of the Contractor to install the equipment to operate properly and in harmony with the intent of the drawings and specifications. The Contractor shall make all incidental changes in piping, ductwork, supports, insulation, heaters, controls and other associated facilities. He shall provide all additional equipment required for proper operation of the system, including all required changes in affected trades. The Contractor shall be responsible for the proper location of rough-in and connections. All such changes shall be made at no increase in cost to the Owner.
- C. Drives and Belt Guards: The Contractor shall provide for each chain or belt drive, rotating shaft, coupling or other moving parts, a protective guard which shall be securely bolted to the equipment base or apparatus. The guard shall completely enclose all moving parts and be constructed to comply with all safety requirements. For double inlet fans, the belt guard shall be arranged so as not to restrict the air flow into the fan inlet. Guards shall not interfere with lubrication of equipment.

- D. Supports: The Contractor shall support plumb, rigid and true to line all work and equipment furnished. The Contractor shall study thoroughly all general, structural and mechanical drawings, shop drawings and catalog data to determine how equipment, fixtures, piping, ductwork, etc., are to be supported, mounted or suspended and shall provide extra steel bolts, inserts, pipe stands, brackets and accessories for proper support whether or not shown on the drawings. When directed, the Contractor shall submit drawings showing supports for review by the Architect/Engineer.

2.3 ACCESS DOORS

- A. General: Access doors shall be provided for all concealed valves, controls, dampers, damper operators and any other equipment or material requiring inspection or maintenance. Access doors shall be furnished for floors, walls, and ceilings, or adequate size so that the concealed items will be readily accessible for servicing or for removal and replacement if necessary.

PART 3 EXECUTION

3.1 COORDINATION

- A. Offsets, transitions and changes in direction in pipes and ducts shall be made as required to maintain proper head room, clearances and pitch of sloping lines whether or not indicated on the drawings. The Contractor shall furnish and install all fittings, traps, drains, air vents, sanitary vents, etc., as required to effect these offsets, transitions and changes in direction.
- B. Ductwork: Exact arrangement and routing of ductwork shall be determined at the job site prior to beginning fabrication of any ductwork. The Contractor shall provide offsets and transitions, and change the cross-sectional dimensions of ductwork when required to meet job conditions but shall maintain at least the same equivalent cross-sectional area. The Contractor shall secure the approval of the Architect/Engineer prior to fabrication of ductwork requiring such changes.
- C. Drawings by the Contractor: When directed by the Architect/Engineer, the Contractor shall submit for review drawings clearly showing certain portions of the Mechanical work and its relation to the work of other trades before commencing shop fabrication or erection at the project site.

3.2 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to project site identified with names, model numbers, types, grades, compliance labels, and other information needed for distinct identification; adequately packaged and protected to prevent damage during shipment, storage and handling. Protect stored equipment and materials from damage. Comply with manufacturer's rigging and moving instructions for unloading equipment and moving into final location.

3.3 INSTALLATION OF ACCESS DOORS

- A. Install access doors at all concealed valves, controls, dampers, damper operators, other equipment or materials requiring inspection or maintenance, where indicated and where required by Code, in accordance with manufacturer's written instructions and in compliance with industry practices.
- B. Coordinate with other work, including substrate construction work, as necessary to interface installation of access doors with other work.
- C. Locate each access door accurately in relation to the item requiring access.

3.4 HEATING SYSTEMS START-UP

- A. When the initial start-up of heating systems occurs during cold weather, the Contractor shall provide and operate temporary heating equipment to heat the building, or the appropriate areas within the building, to the following minimum temperatures prior to the initial heating systems start-up:
 - 1. 55 degrees F.

END OF SECTION

SECTION 15060 HANGERS AND SUPPORTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hanger rods.
 - 2. Flashing.
 - 3. Equipment Supports.
 - 4. Escutcheons.
 - 5. Formed steel channel.

PART 2 PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

- A. Refer to piping specification sections.

2.2 ACCESSORIES

- A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.3 FLASHING

- A. Metal Flashing: 26 gage thick galvanized steel.
- B. Metal Counterflashing: 22 gage thick galvanized steel.
- C. Lead Flashing:
 - 1. Waterproofing: 5 lb./sq. ft sheet lead
 - 2. Soundproofing: 1 lb./sq. ft sheet lead.
- D. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.
- E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.4 EQUIPMENT SUPPORTS

- A. Formed Steel Channel:
 - 1. Manufacturers:
 - a. Allied Tube & Conduit Corp.
 - b. B-Line Systems.
 - c. Midland Ross Corporation, Electrical Products Division.
 - d. Unistrut Corp.
 - 2. Product Description: Galvanized 12 gage thick steel with holes 1-1/2 inches on center.

- B. Concrete Housekeeping Pads and Fabricated Equipment Supports: Refer to Part 3 of this Section.

2.5 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.
- C. Sleeves for Round Ductwork: Galvanized steel.
- D. Sleeves for Rectangular Ductwork: Galvanized steel or wood.
- E. Sealant: Acrylic.

2.6 MECHANICAL SLEEVE SEALS

- A. Manufacturers:
 1. Thunderline Link-Seal, Inc.
 2. Metraflex Co.
 3. NMP Corporation.
- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.7 ESCUTCHEONS

- A. Escutcheons may be solid or hinged type. Escutcheons shall be chrome plated steel, chrome plated brass, or stainless steel. Provide brass or stainless steel escutcheons in wet locations and exterior locations.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive sleeves.

3.2 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 4 inches beyond supported equipment, for all floor mounted equipment.
 1. Concrete shall have a compressive strength of 3,000 psi @ 28 days, 3% to 8% air entrainment, 6" slump maximum upon replacement.
- B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

- C. Construct supports of steel members or formed steel channel. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.3 INSTALLATION - FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked 1 inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash, and seal.
- C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- D. Seal floor and mop sink drains watertight to adjacent materials.

3.4 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing insulation and caulk.
- F. Where ductwork is visible in finished spaces, provide close fitting metal collar at penetration.
- G. Where piping is visible in finished spaces or exterior locations, install chrome plated steel or stainless steel escutcheons at finished surfaces.

3.5 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 15075
MECHANICAL IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Nameplates.
 2. Tags.
 3. Stencils.
 4. Pipe markers.

1.2 REFERENCES

- A. American Society of Mechanical Engineers:
1. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.3 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

1.4 QUALITY ASSURANCE

- A. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section.

1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 NAMEPLATES

- A. Manufacturers:
1. Craftmark Identification Systems.
 2. Safety Sign Co.
 3. Seton Identification Products.
- B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.2 TAGS

- A. Plastic Tags:**
 - 1. Manufacturers:**
 - a. Craftmark Identification Systems.
 - b. Safety Sign Co.
 - c. Seton Identification Products.
 - 2. Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inches diameter.**

- B. Metal Tags:**
 - 1. Manufacturers:**
 - a. Craftmark Identification Systems.
 - b. Safety Sign Co.
 - c. Seton Identification Products.
 - 2. Brass, aluminum, or stainless steel with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges.**

2.3 STENCILS

- A. Manufacturers:**
 - 1. Craftmark Identification Systems.
 - 2. Safety Sign Co.
 - 3. Seton Identification Products.

- B. Stencils: With clean cut symbols and letters of following size:**
 - 1. Up to 2 inches Outside Diameter of Insulation or Pipe: 1/2 inch high letters.
 - 2. 2-1/2 to 6 inches Outside Diameter of Insulation or Pipe: 1-inch high letters.
 - 3. Ductwork and Equipment: 1-3/4 inches high letters.

- C. Stencil Paint: As specified in Division 9, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.**

2.4 PIPE MARKERS

- A. Color and Lettering: Conform to ASME A13.1.**

- B. Plastic Pipe Markers:**
 - 1. Manufacturers:**
 - a. Craftmark Identification Systems.
 - b. Safety Sign Co.
 - c. Seton Identification Products.
 - 2. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.**

PART 3 EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

- A. Wording of equipment, piping and ductwork identification shall be the same as used on the drawings.
- B. Install identifying devices after completion of coverings and painting.
- C. Install plastic nameplates with corrosive-resistant mechanical fasteners.
- D. Install tags using corrosion resistant chain. Number tags consecutively by location.
- E. Identify control panels and major control components outside panels with plastic nameplates.
- F. Identify valves in main and branch piping with tags.
- G. Identify air handling units, condensing units, and fans with numbered tags, plastic nameplates, stenciled painting or factory-installed labels.
- H. Tag automatic controls, instruments, and relays. Key to control schematic.
- I. Identify concealed and exposed piping with appropriate color field, contrasting (black or white) wording and indication of direction of flow. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
 - 1. Plastic Pipe Markers: Snap on around pipe.
 - 2. Stencil Painting: Apply wording and direction of flow (black or white to contrast with background) and minimum 4 inch wide color band each end of wording and direction of flow.

END OF SECTION

SECTION 15080
MECHANICAL INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ductwork insulation.
 - 2. Piping system insulation.
 - 3. Insulation jackets.
 - 4. Insulation accessories including vapor retarders, jackets, and accessories.

- B. Related Sections:
 - 1. Section 15060 - Hangers and Supports: Product and Execution requirements for inserts at hanger locations.
 - 2. Section 15075 - Mechanical Identification: Product requirements for mechanical identification.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 2. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 - 3. ASTM C411 – Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
 - 4. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 5. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 - 6. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
 - 7. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 - 8. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
 - 9. ASTM C1071 - Standard Specification for Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material).
 - 10. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
 - 11. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts.
 - 12. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

13. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 14. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
 15. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
 16. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. Sheet Metal and Air Conditioning Contractors':
1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.3 SUBMITTALS

- A. Submittal data is required for:
 1. Ductwork insulation.
 2. Piping and equipment insulation.
 3. Jackets.
- B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
- C. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section.
- B. Applicator: Company specializing in performing Work of this section.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 DUCTWORK INSULATION: FLEXIBLE

- A. Manufacturers:
 - 1. Owens-Corning Fiberglas Corp.
 - 2. Johns Manville.
 - 3. Knauf Fiber Glass GmbH.
 - 4. Certain-Teed Products Corp.
- B. Insulation: ASTM C1290; Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 - 1. Operating Temperatures: 250 degrees F.
 - 2. Density: 0.75 lb/cu ft.
 - 3. 'K' factor: ASTM C518, 0.30 at 75 degrees F.
- C. Vapor Retarder Jacket: ASTM C1136, Type II Flexible and Low Permeance Vapor Retarders for Thermal Insulation.
 - 1. FRK, Kraft paper with glass fiber yarn and bonded to aluminized film.
- D. Vapor Retarder Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive adhesive.
- E. Vapor Retarder Lap Adhesive:
 - 1. Manufacturers:
 - a. Foster Products Corp.
 - b. Childers Products Co.
 - 2. Compatible with insulation.
- F. Insulation, jacket, tape and adhesive shall comply with the following:
 - 1. Maximum flame spread: ASTM E84; 25.
 - 2. Maximum smoke developed: ASTM E84; 50.
 - 3. Material shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which it is exposed in service. Test temperature shall not fall below 250 degrees F.

2.2 DUCTWORK INSULATION: RIGID

- A. Manufacturers:
 - 1. Owens-Corning Fiberglas Corp.
 - 2. Johns Manville.
 - 3. Knauf Fiber Glass GmbH.
 - 4. Certain-Teed Products Corp.
- B. Insulation: ASTM C612; rigid, noncombustible.

- 1. 'K' factor: ASTM C177 or ASTM C518, 0.23 at 75 degrees F.
 - 2. Maximum Service Temperature: 450 degrees F.
 - 3. Maximum Moisture Absorption: 0.1 percent by volume.
 - 4. Density: 3.0 lb/cu ft.
 - 5. Maximum flame spread: ASTM E84; 25.
 - 6. Maximum smoke developed: ASTM E84; 50.
- C. Vapor Retarder Jacket: ASTM C1136 types I and II.
- 1. ASJ, White kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture vapor transmission: ASTM E96; 0.02 perm.
 - 3. Secure with pressure sensitive tape or two coats of vapor barrier mastic and glass tape.
- D. Vapor Retarder Tape:
- 1. White kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive adhesive.
- E. Indoor Vapor Retarder Finish:
- 1. Manufacturers:
 - a. Foster Products Corp.
 - b. Childers Products Co.
 - 2. Cloth: Untreated; 9 oz/sq yd weight, glass fabric.
 - 3. Vinyl emulsion type acrylic, compatible with insulation, white color.
- F. Insulation, jacket, tape and adhesive shall comply with the following:
- 1. Maximum flame spread: ASTM E84; 25.
 - 2. Maximum smoke developed: ASTM E84; 50.
 - 3. Material shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which it is exposed in service. Test temperature shall not fall below 250 degrees F.

2.3 PIPING INSULATION: POLYETHYLENE

- A. Manufacturers:
- 1. Nomaco K-Flex IMCOA.
- B. Insulation: ASTM C534, flexible, closed cell, polyethylene tubing.
- 1. 'K' factor: ASTM C177, 0.24 at 75 degrees F.
 - 2. Minimum service temperature: -110 degrees F.
 - 3. Maximum service temperature: 210 degrees F.
 - 4. Density: 1.5 lb/cu ft.
 - 5. Maximum moisture absorption: 0.5 percent by volume.
 - 6. Moisture vapor transmission: ASTM E96, 0.01 perm inches.
 - 7. Maximum flame spread: ASTM E84; 25.
 - 8. Maximum smoke developed: ASTM E84; 50.
 - 9. Connection: Contact adhesive, tape, IMCOA Fuse Seal.

2.4 PIPING AND EQUIPMENT INSULATION: ELASTOMERIC CELLULAR FOAM

- A. Manufacturers:

1. Nomaco K-Flex.
 2. Armstrong World Industries, Inc.
 3. Halstead Industrial Products.
- B. Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular form:
 1. ASTM C534; Type I, Tubular form, unslit tubing or pre-slit tubular with factory-applied pressure sensitive adhesive.
 2. ASTM C534, type II, Sheet form.
 3. 'K' factor: ASTM C177, 0.27 at 75 degrees F.
 4. Minimum service temperature: 0 degrees F.
 5. Maximum service temperature: 200 degrees F.
 6. Moisture vapor transmission: ASTM E96, 0.10 perm inches.
 7. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive:
 1. Air dried, contact adhesive, compatible with insulation.

2.5 JACKETS

- A. PVC Plastic Pipe Fitting Covers and Jacket:
 1. Manufacturers:
 - a. Johns Manville Zeston.
 - b. Speedline.
 - c. Topline Products, Inc.
 2. Product Description: ASTM D1784, One piece molded type fitting covers and sheet material, off-white color.
 3. Thickness: 15 mil.
 4. Maximum flame spread: ASTM E84; 25.
 5. Maximum smoke developed: ASTM E84; 50.
 6. Minimum Service Temperature: 0 degrees F.
 7. Maximum Service Temperature: 150 degrees F.
 8. Connections: Brush on welding adhesive, tacks or pressure sensitive color matching vinyl tape.
 9. Covering Adhesive Mastic: Compatible with insulation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify piping, equipment and ductwork have been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- A. Install in accordance with NAIMA National Insulation Standards and manufacturer's published instructions.

- B. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Division 7 for penetrations of assemblies with fire resistance rating greater than one hour.
- C. Finish insulation at supports, protrusions, and interruptions.

3.3 DUCTWORK INSULATION:

- A. Insulate the following ducts:
 - 1. All supply ducts.
 - 2. All outdoor air ducts.
 - 3. Return ducts in mechanical rooms, attics and crawl spaces.
- B. Duct Insulation Application:
 - 1. Provide insulation with vapor retarder jackets.
 - 2. Finish with tape and vapor retarder jacket.
 - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 - 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints. Where service access is required, bevel and seal ends of insulation.
 - 5. Secure insulation with vapor retarder with staples or vapor retarder tape. On surfaces 24 inches in width or greater, additionally secure insulation with mechanical fasteners. Seal jacket joints with vapor retarder adhesive or tape to match jacket.
 - 6. Install without sag on underside of ductwork. Use mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
 - 7. Seal vapor retarder penetrations by mechanical fasteners with vapor retarder adhesive.
 - 8. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
- C. Concealed Ductwork: Insulate with flexible ductwork insulation 2 inches thick.
- D. Ductwork Exposed in Mechanical Equipment Rooms or Finished Spaces:
 - 1. Insulate with rigid ductwork insulation 2 inches thick.
 - 2. Insulate all supply ducts, return ducts, outside air ducts, combustion air ducts, condenser intake and exhaust ducts.

3.4 PIPING INSULATION:

- A. Exposed Piping: Locate insulation and cover seams in least visible locations.
- B. Insulated pipes conveying fluids below ambient temperature:
 - 1. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
- C. Glass fiber insulated pipes conveying fluids below ambient temperature:

1. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.
- D. For hot piping conveying fluids 140 degrees F or less, insulation of flanges and unions is not required; bevel and seal ends of adjacent insulation.
- E. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- F. Glass fiber and mineral fiber insulated pipes conveying fluids above ambient temperature:
 1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass or synthetic cloth and mastic or PVC fitting covers.
- G. Piping Located Outdoors:
 1. Glass Fiber and Hydrous Calcium Silicate Insulation: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal equipment.
 2. Elastomeric Cellular Foam Insulation: Apply manufacturer approved finish in accordance with manufacturer's instructions.
 3. Polyethylene Insulation: No jacket or additional finish is required.
- H. Inserts and Shields:
 1. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts or insulation. Provide shields at all hangers supporting insulated piping and equipment.
 2. Insert application: Piping or Equipment 1-1/2 inches diameter and larger.
 3. Insert location: Between support shield and piping and under finish jacket.
 4. Insert configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be factory fabricated.
 5. Insert material: Compression resistant insulating material suitable for planned temperature range and service.
- I. Plumbing Systems:
 1. Domestic Hot Water and Cold Water Supply:
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: 1 inch and smaller.
 - 2) Thickness: $\frac{1}{2}$ inch.

- b. Glass Fiber Insulation:
 - 1) Pipe Size Range: 1-1/4 inch and larger.
 - 2) Thickness: 1 inch.
 - c. Elastomeric Cellular Foam Insulation:
 - 1) Pipe Size Range: 1 inch and smaller.
 - 2) Thickness: ½ inch.
 - d. Polyethylene Insulation:
 - 1) Pipe Size Range: 1 inch and smaller.
 - 2) Thickness: ½ inch.
- 2. Domestic Hot Water Recirculation:
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: 1 inch.
 - b. Elastomeric Cellular Foam Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: 1 inch.
 - c. Polyethylene Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: 1 inch.
- 3. Sanitary Sewer Above Grade: Insulate floor drain bodies and horizontal piping beneath mechanical equipment rooms.
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: ½ inch.
 - b. Elastomeric Cellular Foam Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: ½ inch.
 - c. Polyethylene Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: ½ inch.

J. Cooling Systems:

- 1. Condensate Drains:
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: ½ inch.
 - b. Elastomeric Cellular Foam Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: ½ inch.
 - c. Polyethylene Insulation:
 - 1) Pipe Size Range: All.
 - 2) Thickness: ½ inch.
- 2. Refrigerant Suction and Hot Gas:
 - a. Polyethylene Insulation, Interior and Exterior, Above Ground and Below Ground:
 - 1) Pipe Size Range: 1-1/2 inch and smaller.
 - 2) Thickness: 1 inch.
 - b. Polyethylene Insulation, Interior and Exterior, Above Ground and Below Ground:
 - 1) Pipe Size Range: Larger than 1-1/2 inch.
 - 2) Thickness: 1-1/2 inch.

- c. Elastomeric Cellular Foam Insulation, Interior and Exterior, Above Ground Only:
 - 1) Pipe Size Range: 1-1/2 inch and smaller.
 - 2) Thickness: 1 inch.
- d. Elastomeric Cellular Foam Insulation, Interior and Exterior, Above Ground Only:
 - 1) Pipe Size Range: Larger than 1-1/2 inch.
 - 2) Thickness: 1-1/2 inch.

END OF SECTION

SECTION 15180
HEATING AND COOLING PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. **Section Includes:**
 - 1. Equipment drains and over flows.
 - 2. Combustion air intake piping.
 - 3. Combustion exhaust piping.

- B. **Related Sections:**
 - 1. Section 15060 - Hangers and Supports: Product requirements for firestopping for placement by this section.
 - 2. Section 15075 - Mechanical Identification: Product requirements for pipe identification for placement by this section.
 - 3. Section 15080 - Mechanical Insulation: Product requirements for Piping Insulation for placement by this section.
 - 4. Electrical Drawings - Wiring Connections: Execution requirements for electric connections specified by this section.

1.2 REFERENCES

- A. **American Society of Mechanical Engineers:**
 - 1. ASME B16.3 - Malleable Iron Threaded Fittings.
 - 2. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
 - 3. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
 - 4. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
 - 5. ASME B31.1 - Power Piping.
 - 6. ASME B31.9 - Building Services Piping.
 - 7. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.
 - 8. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

- B. **ASTM International:**
 - 1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
 - 3. ASTM B32 - Standard Specification for Solder Metal.
 - 4. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
 - 5. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

6. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 7. ASTM D2467 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
 8. ASTM D2661 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings.
 9. ASTM D2665 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
 10. ASTM D2680 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
 11. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
 12. ASTM F441/F441M - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
 13. ASTM F628 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core.
 14. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
- C. Manufacturers Standardization Society of the Valve and Fittings Industry:
1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
 2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
 3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.3 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections whenever jointing dissimilar metals in open systems.
- B. Provide flanges, union, and couplings at locations requiring servicing. Use unions, flanges, and couplings downstream of valves and at equipment or apparatus connections. Do not use direct welded or threaded connections to valves, equipment or other apparatus.
- C. Provide pipe hangers and supports in accordance with ASME B31.1, ASME B31.9, ASTM F708, MSS SP 58, MSS SP 69, and MSS SP 89.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of piping and equipment.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.

- B. Perform Work in accordance with AWS D1.1 for welding hanger and support attachments to building structure.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section.
- B. Fabricator or Installer: Company specializing in performing Work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system Protect

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 EQUIPMENT DRAINS AND OVERFLOWS

- A. Steel Pipe: ASTM A53, Schedule 40 galvanized.
 - 1. Fittings: Galvanized cast iron, or ASME B16.3 malleable iron.
 - 2. Joints: Threaded, or grooved mechanical couplings.
- B. Copper Tubing: ASTM B88, Type L, hard drawn.
 - 1. Fittings: ASME B16.18, cast brass, or ASME B16.22 solder wrought copper.
 - 2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F.
- C. PVC Pipe: ASTM D1785, Schedule 40, or ASTM D2241, SDR 21 or 26.
 - 1. Fittings: ASTM D2466 or ASTM D2467, PVC.
 - 2. Joints: ASTM D2855, solvent weld.

2.2 COMBUSTION AIR INTAKE PIPING FOR FURNACE

- A. ABS Pipe: ASTM D2661 Schedule 40.
 - 1. Fittings: ABS.
 - 2. Joints: ASTM D2468, solvent weld with D2235 solvent cement.
- B. CPVC Pipe: ASTM F441 Schedule 40.

1. Fittings: ASTM F438, CPVC.
 2. Joints: ASTM D2846/D2846M, solvent weld with ASTM F493 solvent cement.
- C. PVC Pipe: ASTM D1785 Schedule 40.
1. Fittings: ASTM D2466, PVC.
 2. Joints: ASTM D2855, solvent weld with ASTM D2564 Solvent cement.

2.3 COMBUSTION EXHAUST PIPING FOR CONDENSING FURNACE

- A. ABS Pipe: ASTM D2661 Schedule 40.
1. Fittings: ABS.
 2. Joints: ASTM D2468, solvent weld with D2235 solvent cement.
- B. CPVC Pipe: ASTM F441 Schedule 40.
1. Fittings: ASTM F438, CPVC.
 2. Joints: ASTM D2846/D2846M, solvent weld with ASTM F493 solvent cement.
- C. PVC Pipe: ASTM D1785 Schedule 40.
1. Fittings: ASTM D2466, PVC.
 2. Joints: ASTM D2855, solvent weld with ASTM D2564 Solvent cement.

2.4 UNIONS, FLANGES, AND COUPLINGS

- A. Unions for Pipe 2 inches and Smaller:
1. Ferrous Piping: 150 psig malleable iron, threaded.
 2. Copper Pipe: Class 150, bronze, soldered joints.
 3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
 4. PVC Piping: PVC.
 5. CPVC Piping: CPVC.
- B. Flanges for Pipe 2-1/2 inches and Larger:
1. Ferrous Piping: 150 psig forged steel, slip-on.
 2. Copper Piping: Class 150, slip-on bronze flanges.
 3. PVC Piping: PVC flanges.
 4. CPVC Piping: CPVC flanges.
 5. Gaskets: 1/16 inch thick preformed neoprene.
- C. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to copper screwed joint adapters, model 646-P3 or 647-P3, by Sioux Chief Manufacturing:
1. Fittings shall conform to ASTM F1970 Standard for PVC piping systems and shall be designed for use with any PVC pipe and fittings conforming to ASTM D 2466 PVC Schedule 40.
- D. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions, or ASTM D2464, Schedule 80, threaded, PVC pipe.

2.5 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
 - 1. Carpenter & Paterson Inc.
 - 2. Creative Systems Inc.
 - 3. Flex-Weld, Inc.
 - 4. Globe Pipe Hanger Products, Inc.
 - 5. Michigan Hanger Co.
 - 6. Superior Valve Co.
 - 7. Tolco.
- B. Conform to ASME B31.1, ASME 31.9, ASTM F708, MSS SP 58, MSS SP 69, and MSS SP 89.
- C. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or carbon steel, adjustable swivel, split ring.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- E. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hooks.
- F. Vertical Support: Steel riser clamp.
- G. Copper Pipe Support: Carbon steel rings, adjustable, copper plated.
- H. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

2.6 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- E. After completion, fill, clean, and treat systems. Refer to Section 15185.

2.7 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install in accordance with ASME B31.9, ASTM F708 and MSS SP 89.
- B. Support horizontal piping as required by code.
- C. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- D. Place hangers within 12 inches of each horizontal elbow.

- E. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- F. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
- G. Where installing several pipes in parallel and at same elevation, provide multiple pipe hangers or trapeze hangers.
- H. Provide copper plated hangers and supports for copper piping.
- I. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

2.8 INSTALLATION - ABOVE GROUND PIPING SYSTEMS

- A. Install hydronic piping in accordance with ASME B31.9.
- B. Route piping parallel to building structure and maintain gradient.
- C. Install piping to conserve building space, and not interfere with use of space.
- D. Group piping whenever practical at common elevations.
- E. Sleeve pipe passing through partitions, walls and floors. Refer to Section 15060.
- F. Install pipe identification in accordance with Section 15075.
- G. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds. Refer to Division 5.
- H. Insulate piping and equipment; refer to Section 15080.
- I. Install combustion air intake piping and combustion exhaust piping in accordance with furnace manufacturer's instructions. Piping material shall be type recommended by furnace manufacturer.

2.9 TESTING

- A. Equipment drains shall be tested by filling with cold water to the top after plugging all openings. The test shall be conducted for a period of time sufficient to inspect every joint in the system but not less than 15 minutes. No loss of water will be allowed.

END OF SECTION

SECTION 15739
SPLIT SYSTEM AIR CONDITIONING UNITS

PART 1 ENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Air handling unit.
 - 2. Condensing unit.
- B. Related Sections:
 - 1. Section 15820 - Duct Accessories: Flexible connections.

1.2 REFERENCES

- A. Air-Conditioning and Refrigeration Institute:
 - 1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- C. ASTM International:
 - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Submittals are required for the following items:
 - 1. Air Handling Units.
 - 2. Condensing Units and Heat Pumps.
- B. Product Data: Submit data indicating:
 - 1. Cooling and heating capacities.
 - 2. Dimensions.
 - 3. Weights.
 - 4. Rough-in connections and connection requirements.
 - 5. Duct connections.
 - 6. Electrical requirements with electrical characteristics and connection requirements.
 - 7. Controls.
 - 8. Accessories.
- C. Design Data: Indicate refrigerant pipe sizing.
- D. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.

- E. Manufacturer's Field Reports: Submit start-up report for each unit.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of controls installed remotely from units.
- B. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

1.5 QUALITY ASSURANCE

- A. Performance Ratings: Energy Efficiency Rating (EER) not less than prescribed by ASHRAE 90.1 when used in combination with compressors and evaporator coils.
- B. Cooling Capacity: Rate in accordance with ARI 210/240.
- C. Insulation: Insulation and insulation adhesive shall have a flame spread rating not more than 25 and a smoke developed rating not more than 50, when tested in accordance with ASTM E84.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section.
- B. Installer: Company specializing in performing Work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept units and components on site in factory protective containers, with factory shipping skids and lifting lugs. Inspect for damage.
- B. Comply with manufacturer's installation instruction for rigging, unloading and transporting units.
- C. Protect units from weather and construction traffic by storing in dry, roofed location.

1.8 COORDINATION

- A. Coordinate installation of condensing units with adjacent equipment.
- B. Coordinate installation of air handling units with building structure.

1.9 WARRANTY

- A. Furnish one year manufacturer's warranty including parts, refrigerant, and labor.
- B. Furnish five year manufacturer's warranty for compressors.

1.10 MAINTENANCE MATERIALS

- A.** Furnish one set for each unit of fan belts and air filters.

PART 2 PRODUCTS

2.1 SPLIT SYSTEM AIR CONDITIONING UNITS

- A.** Manufacturers:
 1. Lennox Inc.
 2. The Trane Company.
 3. York International.
- B.** Product Description:

Systems 5 tons and smaller: Split system consisting of high efficiency gas fired furnace with DX cooling coil, and condensing unit including cabinet, evaporator fan, refrigerant cooling coil, compressor, refrigeration circuit, condenser, air filters, controls, air handling unit accessories, condensing unit accessories, and refrigeration tubing and specialties.

2.2 HIGH EFFICIENCY GAS FIRED FURNACE

- A.** Manufacturers:
 1. Lennox.
 2. The Trane Company.
 3. York International.
- B.** Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating element, controls, air filter, and accessories; wired for single power connection with control transformer.
- C.** Burners: Multiport inshot burners. Cycle tested, heavy gauge aluminized steel heat exchanger.
- D.** Supply Fan: Low energy power vent blower. Variable speed blower motor, which will switch from heating to cooling speeds on demand upon control signal. Blower door safety switch shall terminate furnace operation when blower door is removed.
- E.** Control System: Operational program shall provide total control of furnace limit sensors, blowers, gas valve, flame control and include self diagnostics for ease of service.
- F.** Features: Adaptive Heat Up Silicon Nitride Hot Surface Ignition System. Integrated system control shall light the main burners upon a demand for heat from the control system, low energy power venter, vent proving pressure switch, heat exchanger lined with foil faced fiberglass insulation.

- G. Coil: Copper tube aluminum fin assembly, galvanized or polymeric drain pan, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve, steel cabinet with baked enamel finish and insulation.
- H. Electric Heater: Helix wound bare nichrome wire heating elements arranged in incremental stages of with porcelain insulators.

2.3 CONDENSING UNIT

- A. General: Factory assembled and tested air cooled condensing units, consisting of casing, compressors, condensers, coils, condenser fans and motors, and unit controls.
- B. Unit Casings: Exposed casing surfaces constructed of galvanized steel with manufacturer's standard baked enamel finish. Designed for outdoor installation and complete with weather protection for components and controls, and complete with removable panels for required access to compressors, controls, condenser fans, motors, and drives.
- C. Compressor: Single refrigeration circuit with hermetic scroll compressor, resiliently mounted, with positive lubrication, and internal motor overload protection.
- D. Condenser Coil: Constructed of copper tubing mechanically bonded to aluminum fins, factory leak and pressure tested.
- E. Controls: Furnish operating and safety controls including high and low pressure cutouts. Control transformer. Furnish magnetic contactors for compressor and condenser fan motors.
- F. Condenser Fans and Drives: Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Permanently lubricated ball bearing type motors with built-in thermal overload protection. Furnish high efficiency fan motors.
- G. Condensing Unit Accessories: Furnish the following accessories:
 1. Time delay relay.
 2. Anti-short cycle timer.
 3. Disconnect switch.
- H. Refrigerant: Furnish charge of refrigerant R-410.

2.4 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Wiring Connections: Requirements for electrical characteristics see electrical drawings.
- B. Disconnect Switch: Mount switch on or near equipment.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify concrete pad for condensing unit is ready for unit installation.
- B. Verify building is ready for installation of units and openings are as indicated on Drawings.

3.2 INSTALLATION - AIR HANDLING UNIT

- A. Install air handling units using vibration isolators per manufacturer's recommendation.
- B. Connect air handling units to supply and return ductwork with flexible connections. Refer to Section 15820.
- C. Install condensate piping with trap and route from drain pan to location indicated on drawings.
- D. Install components furnished loose for field mounting.
- E. Install connection to electrical power wiring in accordance with Division 16.

3.3 INSTALLATION - CONDENSING UNIT

- A. Install condensing units on vibration isolators per manufacturer's recommendations.
- B. Install units on concrete pads.
- C. Install refrigeration systems in accordance with ASHRAE 15.
- D. Install refrigerant piping from unit to condensing unit. Install refrigerant specialties furnished with unit. Provide gage ports, service valves, sight glass, filter dryer, and any other accessories required for a complete installation.
- E. Evacuate refrigerant piping and install initial charge of refrigerant.
- F. Install electrical devices furnished loose for field mounting.
- G. Install control wiring between air handling unit, condensing unit, and field installed accessories.
- H. Install connection to electrical power wiring in accordance with electrical drawings.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.

3.5 CLEANING

- A. Install temporary filters during construction period. Replace with permanent filters at Substantial Completion.

3.6 DEMONSTRATION

- A. Demonstrate air handling unit operation and maintenance.
- B. Demonstrate starting, maintenance, and operation of condensing unit

3.7 PROTECTION OF FINISHED WORK

- A. Do not operate air handling units until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION

SECTION 15810 DUCTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Duct Materials.
 - 2. Insulated Flexible Ducts.
 - 3. Ductwork fabrication.
 - 4. Duct cleaning.

- B. Related Sections:
 - 1. Section 15060 - Hangers and Supports: Product requirements for hangers, supports and sleeves for placement by this section.
 - 2. Section 15820 - Duct Accessories: Product requirements for duct accessories for placement by this section.

1.2 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

- B. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

- C. Underwriters Laboratories Inc.:
 - 1. UL 181 - Factory-Made Air Ducts and Connectors.

1.3 PERFORMANCE REQUIREMENTS

- A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.4 SUBMITTALS

- A. Product Data: Submit data for:
 - 1. Insulated Flexible Ducts.
 - 2. Single wall spiral round ducts.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section.
- B. Installer: Company specializing in performing Work of this section.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures during and after installation of duct sealant.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 DUCT MATERIALS

- A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G60.
 - 2. Finishes for Surfaces Exposed to View: Mill phosphatized (paint grip).
- B. Fasteners: Rivets, bolts, or sheet metal screws.
- C. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.2 INSULATED FLEXIBLE DUCTS

- A. Manufacturers:
 - 1. Flexmaster U.S.A., Inc., Type 5M.
 - 2. ATCO Rubber Products, Inc. #036.
 - 3. Thermaflex model M-KC.
- B. Product Description: UL 181, Class 1 air duct, polyester or coated fiberglass fabric liner supported by helical wound spring of galvanized or coated steel wire; fiberglass insulation; reinforced metalized polyester outer jacket.
 - 1. Pressure Rating: 6 inches wg positive and $\frac{3}{4}$ inch wg negative.
 - 2. Maximum Velocity: 4000 fpm.
 - 3. Temperature Range: -20 degrees F to 250 degrees F.
 - 4. Thermal Resistance: 6.0 square feet-hour-degree F per BTU.

5. Maximum flame spread rating = 25; maximum smoke developed rating = 50.
6. Connections to rectangular ductwork: Straight spin collar fitting with damper and locking operator.

2.3 DUCTWORK FABRICATION

- A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings. Furnish duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Fabricate and support round ducts with longitudinal seams in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible (Round Duct Construction Standards), and [as indicated on Drawings]. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- C. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide [airfoil] turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

- A. Install ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Seal all joints, seams and duct wall penetrations with liquid or mastic sealant. Sealant not required where ductwork is exposed to view in the conditioned space.
- C. Duct sizes are sheet metal dimensions; allowance has been made for duct liner where duct liner is indicated to be installed.
- D. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- E. Use crimp joints with or without bead or beaded sleeve couplings for joining round duct sizes 8 inch and smaller.
- F. Install duct hangers and supports in accordance with Section 15060.

- G. Use double nuts and lock washers on threaded rod supports.
- H. Connect flexible ducts to metal ducts with draw bands or adhesive plus sheet metal screws.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.

3.4 CLEANING

- A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air flow, clean one half of system completely before proceeding to other half. Protect equipment with potential to be harmed by excessive dirt with temporary filters, or bypass during cleaning.

3.5 SCHEDULES

DUCTWORK MATERIAL SCHEDULE

AIR SYSTEM	MATERIAL
Supply	Steel
Return and Relief	Steel
General Exhaust	Steel

DUCTWORK PRESSURE CLASS SCHEDULE

Constant Volume Supply	2 inch wg regardless of velocity.
Return and Relief	1 inch wg regardless of velocity.
General Exhaust	1 inch wg regardless of velocity.

END OF SECTION

SECTION 15820 DUCT ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Air Turning Devices And Extractors.
 - 2. Flexible Duct Connections
 - 3. Duct Access Doors.
 - 4. Duct Test Holes.
 - 5. Volume Control Dampers.
 - 6. Motor Operated Dampers.
- B. Related Sections:
 - 1. Section 15810 - Ducts: Requirements for duct construction and pressure classifications.
 - 2. Electrical Drawings - Wiring Devices: Execution requirements for connection of electrical Smoke Dampers and Combination Smoke and Fire Dampers specified by this section.

1.2 REFERENCES

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 500-D – Laboratory Methods for Testing Dampers for Ratings.
 - 2. AMCA 511 – Certified Ratings Program for Air Control Devices.
- B. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- C. Underwriters Laboratories Inc.:
 - 1. UL 181 - Factory-Made Air Ducts and Connectors.

1.3 SUBMITTALS

- A. Submit manufacturer's product data required for:
 - 1. Duct Access Doors.
 - 2. Volume Control Dampers.
 - 3. Motor Operated Dampers.
- B. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of all dampers, access doors, and test holes.

- B. Operation and Maintenance Data: Submit for Combination Smoke and Fire Dampers.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect dampers from damage to operating linkages and blades.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.8 COORDINATION

- A. Coordinate Work where appropriate with building control Work.

PART 2 PRODUCTS

2.1 AIR TURNING DEVICES AND EXTRACTORS

- A. Turning Vanes: Provide turning vanes, curved single or airfoil blades of galvanized steel or aluminum, set into strips suitable for mounting in ductwork, and constructed in accordance with SMACNA Standards.

2.2 FLEXIBLE DUCT CONNECTIONS

- A. Manufacturers:

1. Duro Dyne National Corp., Metal Fab
2. Cain Manufacturing Co., Inc.

- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.

- C. Connector: Fabric crimped into metal edging strip.

1. Fabric: Fire-retardant neoprene coated woven glass fiber fabric, minimum density 30 oz per sq yd.
2. Net Fabric Width: Approximately 3 inches wide.
3. Metal: 3 inch wide, 24 gage galvanized steel.
4. Connectors shall be listed and labeled to requirements of UL 181 for Class 0 or Class 1 flexible air connectors.

2.3 DUCT ACCESS DOORS

- A. Manufacturers:

1. Ruskin Manufacturing Co.
2. C. E. Sparrow Co., Inc.
3. Air Balance, Inc.

- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible [and as indicated on Drawings].
- C. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, furnish minimum 1 inch thick insulation with sheet metal cover.
 - 1. Less Than 12 inches square, secure with sash locks.
 - 2. Up to 18 inches Square: Furnish two hinges and two sash locks.
 - 3. Up to 24 x 48 inches: Three hinges and two compression latches [with outside and inside handles].
 - 4. Larger Sizes: Furnish additional hinge.
 - 5. Access panels with sheet metal screw fasteners are not acceptable.

2.4 VOLUME CONTROL DAMPERS

- A. Manufacturers:
 - 1. Ruskin Manufacturing Co.
 - 2. C. E. Sparrow Co., Inc.
 - 3. Arrow United Industries, Inc.
 - 4. United Enertech.
- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- C. Rectangular Dampers: Ruskin model MD-35.
 - 1. Frame: 16 gage galvanized steel.
 - 2. Blades: 16 gage galvanized steel.
 - 3. Axles: $\frac{1}{2}$ inch plated steel hex.
 - 4. Linkage: Concealed in frame.
 - 5. Single Blade Damper: Fabricate for duct sizes up to 10 x 48 inches.
 - 6. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in galvanized frame channel with suitable hardware.
 - 7. End Bearings: Nylon or oil-impregnated sintered bronze bearings. Furnish closed end bearings on ducts having pressure classification over 2 inches wg.
- D. Round Dampers 20 inch diameter and smaller: Ruskin model MDRS25.
 - 1. Frame and blade: 20 gage galvanized steel.
 - 2. Axle: 3/8 inch steel.
 - 3. End Bearings: Molded synthetic.
- E. Round Dampers larger than 20 inch diameter: Ruskin model CDRS82.
 - 1. Frame: 12 gage galvanized steel.
 - 2. Blade: 16 gage galvanized steel.
 - 3. Axle: $\frac{1}{2}$ inch continuous plated steel for 24 inch diameter and smaller; $\frac{3}{4}$ inch for dampers larger than 24 inch diameter.
 - 4. End Bearings: Stainless steel.
- F. Quadrants: Young Regulator Co. model 404 or model 404B.

1. Furnish locking, indicating quadrant operators on single and multi-blade dampers.
2. On insulated ducts mount quadrant operators on standoff mounting brackets, bases, or adapters.
3. Where rod lengths exceed 30 inches furnish regulator at both ends.

2.5 MOTOR OPERATED DAMPERS

- A. Manufacturers:
 1. Ruskin Manufacturing Co. model CD36.
 2. C. E. Sparrow Co., Inc.
 3. Arrow United Industries, Inc.
- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
 1. Frame: 16 gage galvanized steel.
 2. Blades: 16 gage galvanized steel, 6 inch width.
 3. Axles: $\frac{1}{2}$ inch plated steel hex.
 4. Linkage: Concealed in frame.
 5. Bearings: Synthetic.
 6. Seals: PVC coated polyester fabric blade seals; flexible metal compression edge seals.
- C. Damper Operators:
 1. General: Provide smooth proportional control with sufficient power for air velocities 20 percent greater than maximum design velocity and to provide tight seal against maximum system pressures. Provide spring return for two position control and for fail safe operation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify ducts and equipment installation are ready for accessories.
- B. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.2 INSTALLATION

- A. Install in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 15810 for duct construction and pressure class.
- B. Install duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers. Install minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access. Install 4 x 4 inch for balancing dampers only. Review locations prior to fabrication.

- C. Install temporary duct test holes where required for testing and balancing purposes. Cut or drill in ducts. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- D. Install dampers square and free from racking.
- E. Do not compress or stretch damper frames into the duct or opening.
- F. Handle dampers using the frame or sleeve. Do not lift or move dampers using blades, actuator or jackshaft.

Provide flexible connections at all duct connections to fans, air handling and where indicated on the drawings.

END OF SECTION

SECTION 15830 FANS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceiling Fans.
- B. Related Sections:
 - 1. Section 15080 - Mechanical Insulation: Product requirements for power ventilators for placement by this section.
 - 2. Section 15810 - Ducts: Product requirements for hangers for placement by this section.
 - 3. Section 15820 - Duct Accessories: Product requirements for duct accessories for placement by this section.
 - 4. Electrical Drawings - Wiring Connections: Execution and product requirements for connecting equipment specified by this section.

1.2 REFERENCES

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 99 - Standards Handbook.
 - 2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
 - 3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
 - 4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
 - 5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- B. American Refrigeration Institute:
 - 1. ARI 1060 - Air-to-Air Energy Recovery Ventilation Equipment Certification Equipment Program.
- C. Underwriters Laboratories Inc.:
 - 1. UL 705 - Power Ventilators.

1.3 SUBMITTALS

- A. Submittal data is required for all fans and accessories.
- B. Shop Drawings: Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.
- C. Product Data: Submit data on fans and accessories including fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.

- D. Manufacturer's Installation Instructions: Submit fan manufacturers instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.5 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
- C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section.
- B. Installer: Company specializing in performing Work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect motors, shafts, and bearings from weather and construction dust.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 CEILING FANS

- A. Manufacturers:
 1. Greenheck Fan Corporation.
 2. Loren Cook Company.
 3. Acme Engineering & Manufacturing Corp.
 4. Penn Ventilation.
- B. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with 1/2 inch acoustic insulation, resilient mounted motor, gravity back-draft damper in discharge opening, integral outlet duct collar.
- C. Disconnect: Cord and plug in housing for thermal overload protected motor.

- D. Grille: Molded white plastic or aluminum with baked white enamel finish.
- E. Wheel: Centrifugal forward curved type constructed of injection molded or polypropylene resin.
- F. Motor: Open drip proof type with permanently lubricated sealed bearings and thermal overload protection.

2.2 DEMONSTRATION

- A. Demonstrate fan operation and maintenance procedures.

END OF SECTION

SECTION 15850
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Diffusers, registers and grilles.
- B. Related Sections:
 - 1. Division 9 - Paints and Coatings: Execution and product requirements for Painting of ductwork visible behind outlets and inlets specified by this section.
 - 2. Division 10 - Wall Louvers: Wall Louvers.
 - 3. Section 15820 - Duct Accessories: Volume dampers for inlets and outlets.

1.2 REFERENCES

- A. Air Movement and Control Association International, Inc.:
 - 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.
- C. Sheet Metal and Air Conditioning Contractors:
 - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.3 SUBMITTALS

- A. Submittal data is required for:
 - 1. Diffusers, registers and grilles.
- B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of air outlets and inlets.

1.5 QUALITY ASSURANCE

- A. Test and rate diffuser, register, and grille performance in accordance with ASHRAE 70.
- B. Test and rate louver performance in accordance with AMCA 500.

1.6 QUALIFICATIONS

- A. Manufacturer:** Company specializing in manufacturing products specified in this section.

PART 2 PRODUCTS

2.1 DIFFUSERS, REGISTERS AND GRILLES

- A. Manufacturers:**
 - 1. Metal Industries, Inc.
 - 2. Price Industries, Inc.
 - 3. Air Concepts, Inc.
 - 4. Krueger.
 - 5. Tuttle and Bailey.
- B.** Diffusers, registers and grilles shall be the type, material, air pattern, and finish indicated on the drawings. Performance including throw and noise generated shall be equivalent to the indicated devices or as approved.
- C.** Provide accessories indicated on drawings.

PART 3 EXECUTION

3.1 INSTALLATION

- A.** Install air outlets and inlets in accordance with manufacturer's instructions.
- B.** Install diffusers, registers and grilles to ductwork with airtight connection.
- C.** Paint visible portion of ductwork behind air outlets and inlets matte black. Refer to Division 9.

3.2 INTERFACE WITH OTHER PRODUCTS

- A.** Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

END OF SECTION

SECTION 15950
TESTING, ADJUSTING AND BALANCING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Testing, adjusting and balancing of air systems.
 - 2. Testing, adjusting and balancing of refrigerating systems.
 - 3. Measurement of final operating condition of HVAC systems.

1.2 REFERENCES

- A. Associated Air Balance Council:
 - 1. AABC MN-1 - National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning and Refrigeration Systems.
- C. Natural Environmental Balancing Bureau:
 - 1. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.

1.3 SUBMITTALS

- A. Submit name and qualifications of Testing, Adjusting and Balancing agency for approval within 30 days of award of contract.
- B. Test Reports: Indicate data on AABC MN-1 National Standards for Total System Balance forms, forms prepared following ASHRAE 111, or NEBB Report forms.
- C. Field Reports: Indicate deficiencies preventing proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- D. Furnish reports in letter size binder manuals, complete with table of contents page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of balancing valves.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with AABC MN-1 National Standards for Field Measurement and Instrumentation, Total System Balance, ASHRAE 111 or

NEBB Procedural Standards for Testing, Balancing and Adjusting of Environmental Systems.

1.6 QUALIFICATIONS

- 1) Engage a TAB contractor certified by AABC or NEBB, specializing in testing, adjusting, and balancing of systems specified in this section. The company shall not be affiliated in any way with the contractor, equipment suppliers or installers.
- 2) Engineer or NEBB Certified Testing, Adjusting and Balancing Supervisor.
 - a) TAB Field Supervisor: Employee of the TAB contractor and certified by AABC or NEBB.
 - b) TAB Technician: Employee of the TAB contractor and who is certified by AABC or NEBB as a TAB technician.

1.7 SEQUENCING

- A. Sequence balancing between completion of systems tested and Date of Substantial Completion.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 1 - Administrative Requirements: Coordination and project conditions.
- B. Verify systems are complete and operable before commencing work. Verify the following:
 1. Systems are started and operating in safe and normal condition.
 2. Temperature control systems are installed complete and operable.
 3. Proper thermal overload protection is in place for electrical equipment.
 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 5. Duct systems are clean of debris.
 6. Fans are rotating correctly.
 7. volume dampers are in place and open.
 8. Air coil fins are cleaned and combed.
 9. Access doors are closed and duct end caps are in place.
 10. Air outlets are installed and connected.
 11. Duct system leakage is minimized.

3.2 PREPARATION

- A. Furnish instruments required for testing, adjusting, and balancing operations.
- B. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

3.3 INSTALLATION TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 10 percent of design.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.4 ADJUSTING

- A. Verify recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.
- D. Report defects and deficiencies noted during performance of services, preventing system balance.
- E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- F. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by Owner.
- G. Check and adjust systems approximately six months after final acceptance and submit report.

3.5 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to obtain required or design supply, return, and exhaust air quantities.
- B. Make air quantity measurements in main ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts.
- E. Use volume control devices to regulate air quantities only to extent adjustments do not create objectionable air motion or sound levels. Effect volume control by using volume dampers located in ducts.
- F. Vary total system air quantities by adjustment of fan speeds. Provide sheave drive changes to vary fan speed. Vary branch air quantities by damper regulation.

- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. On variable air volume systems, make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. At modulating damper locations, take measurements and balance at extreme conditions.
- L. Measure building static pressure and adjust supply, return, and exhaust air systems to obtain required relationship between each to maintain approximately 0.05 inches positive static pressure near building entries.

3.6 SCHEDULES

- A. Equipment Requiring Testing, Adjusting, and Balancing:
 - 1. Plumbing Pumps.
 - 2. Forced Air Furnaces.
 - 3. Air Cooled Refrigerant Condensers.
 - 4. Air Coils.
 - 5. Air Handling Units.
 - 6. Fans.
 - 7. Air Filters.
 - 8. Air Inlets and Outlets.
- B. Report Forms
 - 1. Title Page:
 - a. Name of Testing, Adjusting, and Balancing Agency
 - b. Address of Testing, Adjusting, and Balancing Agency
 - c. Telephone and facsimile numbers of Testing, Adjusting, and Balancing Agency
 - d. Project name
 - e. Project location
 - f. Project Architect
 - g. Project Engineer
 - h. Project Contractor
 - i. Project altitude
 - j. Report date
 - 2. Summary Comments:
 - a. Design versus final performance
 - b. Notable characteristics of system
 - c. Description of systems operation sequence
 - d. Summary of outdoor and exhaust flows to indicate building pressurization

- e. Nomenclature used throughout report
 - f. Test conditions
3. Instrument List:
- a. Instrument
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Range
 - f. Calibration date
4. Electric Motors:
- a. Manufacturer
 - b. Model/Frame
 - c. HP/BHP and kW
 - d. Phase, voltage, amperage; nameplate, actual, no load RPM
 - e. RPM
 - f. Service factor
 - g. Starter size, rating, heater elements
 - h. Sheave Make/Size/Bore
5. V-Belt Drive:
- a. Identification/location
 - b. Required driven RPM
 - c. Driven sheave, diameter and RPM
 - d. Belt, size and quantity
 - e. Motor sheave diameter and RPM
 - f. Center to center distance, maximum, minimum, and actual
6. Pump Data:
- a. Identification/number
 - b. Manufacturer
 - c. Size/model
 - d. Impeller
 - e. Service
 - f. Design flow rate, pressure drop, BHP and kW
 - g. Actual flow rate, pressure drop, BHP and kW
 - h. Discharge pressure
 - i. Suction pressure
 - j. Total operating head pressure
 - k. Shut off, discharge and suction pressures
 - l. Shut off, total head pressure
7. Combustion Test:
- a. Manufacturer
 - b. Model number
 - c. Serial number
 - d. Firing rate
 - e. Overfire draft
 - f. Gas meter timing dial size
 - g. Gas meter time per revolution
 - h. Gas pressure at meter outlet
 - i. Gas flow rate
 - j. Heat input
 - k. Burner manifold gas pressure

- i. Percent carbon monoxide (CO)
 - m. Percent carbon dioxide (CO₂)
 - n. Percent oxygen (O₂)
 - o. Percent excess air
 - p. Flue gas temperature at outlet
 - q. Ambient temperature
 - r. Net stack temperature
 - s. Percent stack loss
 - t. Percent combustion efficiency
 - u. Heat output
- 8. Air Cooled Condenser:
 - a. Identification/number
 - b. Location
 - c. Manufacturer
 - d. Model number
 - e. Serial number
 - f. Entering DB air temperature, design and actual
 - g. Leaving DB air temperature, design and actual
 - h. Number of compressors
- 9. Cooling Coil Data:
 - a. Identification/number
 - b. Location
 - c. Service
 - d. Manufacturer
 - e. Air flow, design and actual
 - f. Entering air DB temperature, design and actual
 - g. Entering air WB temperature, design and actual
 - h. Leaving air DB temperature, design and actual
 - i. Leaving air WB temperature, design and actual
 - j. Saturated suction temperature, design and actual
 - k. Air pressure drop, design and actual
- 10. Air Moving Equipment:
 - a. Location
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Arrangement/Class/Discharge
 - f. Air flow, specified and actual
 - g. Return air flow, specified and actual
 - h. Outside air flow, specified and actual
 - i. Total static pressure (total external), specified and actual
 - j. Inlet pressure
 - k. Discharge pressure
 - l. Sheave Make/Size/Bore
 - m. Number of Belts/Make/Size
 - n. Fan RPM
- 11. Return Air/Outside Air Data:
 - a. Identification/location
 - b. Design air flow

- c. Actual air flow
 - d. Design return air flow
 - e. Actual return air flow
 - f. Design outside air flow
 - g. Actual outside air flow
 - h. Return air temperature
 - i. Outside air temperature
 - j. Required mixed air temperature
 - k. Actual mixed air temperature
 - l. Design outside/return air ratio
 - m. Actual outside/return air ratio
12. Exhaust Fan Data:
- a. Location
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Air flow, specified and actual
 - f. Total static pressure (total external), specified and actual
 - g. Inlet pressure
 - h. Discharge pressure
 - i. Sheave Make/Size/Bore
 - j. Number of Belts/Make/Size
 - k. Fan RPM
13. Duct Traverse:
- a. System zone/branch
 - b. Duct size
 - c. Area
 - d. Design velocity
 - e. Design air flow
 - f. Test velocity
 - g. Test air flow
 - h. Duct static pressure
 - i. Air temperature
 - j. Air correction factor
14. Air Distribution Test Sheet:
- a. Air terminal number
 - b. Room number/location
 - c. Terminal type
 - d. Terminal size
 - e. Area factor
 - f. Design velocity
 - g. Design air flow
 - h. Test (final) velocity
 - i. Test (final) air flow
 - j. Percent of design air flow

END OF SECTION

SECTION 31 05 13 SOIL MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Subsoil materials.
- B. Topsoil materials.

1.2 RELATED SECTIONS (include but are not limited to)

- A. Section 01 33 00 – Submittal Procedures.
- B. Section 01 40 00 – Quality Requirements: Testing soil fill materials.
- C. Section 31 05 16 – Aggregate Materials.
- D. Section 31 22 16 – Rough Grading.
- E. Section 31 25 13 – Erosion and Sediment Control: Slope protection and erosion control.
- F. Section 31 23 23 – Backfill.
- G. Section 31 23 17 – Trenching.
- H. Section 32 91 19 – Landscape Grading.

1.3 REFERENCES

VIRGINIA DEPARTMENT OF TRANSPORTATION

- A. VDOT, "Road & Bridge Standards & Specifications," latest edition.

AMERICAN SOCIETY OF TESTING AND MATERIALS

- B. ASTM D698 – Std. Test Method for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
- C. ASTM D2487 – Classification of Soils for Engineering Purposes.
- D. ASTM D2922 – Std. Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D3017 – Std. Test Method for Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

- F. ASTM D4318 – Std. Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits).

1.4 SUBMITTALS FOR REVIEW

- A. Section 01 33 00 – Submittal Procedures.
- B. Materials Source: Submit name of imported materials source, to Geotechnical Engineer.
- C. Samples: Submit, in air-tight containers, 10 lb sample of each type of fill to appropriate testing laboratory.

1.5 QUALITY ASSURANCE

- A. Furnish each individual soil material from single source throughout the work.

PART 2 PRODUCTS

2.1 SUBSOIL MATERIALS

- A. Subsoil Type S1:
 1. Excavated and re-used material, imported borrow, or select or local borrow.
 2. Graded.
 3. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris; Less than 1% (by weight) of organic matter or other deleterious material.
 4. Conforming to ASTM D2487 Group Symbol CL, ML, SM, SC, SP, or better.
 5. Maximum Liquid Limit of 50 and maximum Plasticity Index of 25.

2.2 TOPSOIL MATERIALS (See Section 32 91 19 – Landscape Grading for Schedule)

- A. Topsoil Type T1:
 1. On-site topsoil, excavated and reused material, conforming to Virginia Erosion & Sediment Control Handbook Standard & Spec. 3.30 TOPSOILING.
 2. Graded.
- B. Topsoil Type T2:
 1. Imported borrow.
 2. Natural, fertile, friable loamy soil (loam, sandy loam, silty loam, sandy clay loam, or clay loam), of 20-70% sand, 10-60% silt, and 5-30% clay.
 3. Characteristic of productive soils in the vicinity which produce desirable vegetation and obtained from naturally well-drained areas.
 4. Reasonably free of roots, rocks larger than 1 inch, subsoil, debris, weeds, and foreign matter.

5. Free of toxic substances or any other material or substance which might be harmful to plant growth or a hindrance to grading maintenance operations.
6. Acidity range (adjusted pH) of 6.0 to 7.0.
7. With additives as recommended in soil analysis report.

2.3 SOURCE QUALITY CONTROL

- A. Section 01 40 00 – Quality Requirements: Testing and analysis of soil material.
- B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698 (Standard Proctor) and D2487 (Classification of Soils).
- C. Testing and Analysis of Topsoil Material: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of, inorganic matter (sand, silt, & clay), deleterious material, pH, and mineral and plant nutrient content of topsoil. Report suitability of topsoil for growth of applicable planted material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.
- D. If tests indicate materials do not meet specified requirements, change material and retest.
- E. Furnish materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXCAVATION

- A. Excavate subsoil and topsoil from areas designated. Strip topsoil to full depth.
- B. Remove lumped soil, boulders, and rock.
- C. Stockpile excavated material, suitable for reuse, in a designated area onsite.
- D. Remove excess material not being used from site.
- E. Remove excavated materials not meeting requirements for reuse from site.

3.2 STOCKPILING

- A. Stockpile in sufficient quantities to meet Project schedule and requirements.
- B. Separate differing materials with dividers or stockpile apart to prevent mixing.
- C. Prevent intermixing of soil types or contamination.

- D. Direct surface waters away from stockpile site to prevent erosion or deterioration of materials.
- E. Stockpile topsoil 8 feet high maximum.

3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in a clean, neat, and stabilized condition. Grade site surface to prevent freestanding surface water.
- B. If a borrow area is utilized, leave area in a clean, neat, and stabilized condition. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 31 05 16
AGGREGATE MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. **Section Includes**
 - 1. Course Aggregate Materials.
 - 2. Fine Aggregate Materials.
- B. **RELATED SECTIONS** (including but not limited to:)
 - 1. Document 00 30 00 – Information Available to Bidders: Subsurface Investigation (Geotechnical) report; recommended needs for aggregate materials.
 - 2. Section 01 33 00 – Submittal Procedures.
 - 3. Section 01 40 00 – Quality Requirements: Testing aggregate fill materials.
 - 4. Section 31 22 13 – Rough Grading.
 - 5. Section 31 25 13 – Erosion and Sediment Control: Slope protection and erosion control.
 - 6. Section 31 23 23 – Backfilling.
 - 7. Section 31 23 17 – Trenching.
 - 8. Section 32 12 16 – Asphalt Paving.
 - 9. Section 32 13 13 – Concrete Paving.
 - 10. Section 33 11 16 – Water Distribution System.
 - 11. Section 33 46 00 – Subdrainage: Filter aggregate.
 - 12. Section 33 41 00 – Storm Drainage.
 - 13. Section 33 31 00 – Sanitary Sewer System.

1.2 REFERENCES

AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS

- A. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate.

AMERICAN SOCIETY OF TESTING AND MATERIALS

- A. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
- C. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- D. ASTM D3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

VIRGINIA DEPARTMENT OF TRANSPORTATION

- E. VDOT "Road & Bridge Standards & Specifications," latest edition.
- F. VDOT "Special Provision for Flowable Backfill" dated March 11, 2010.

1.3 SUBMITTALS FOR INFORMATION

- A. Section 01 33 00 – Submittal Procedures.
- B. Manufacturer's Certificate: Submit name of imported materials suppliers to Geotechnical Engineer.

1.4 QUALITY ASSURANCE

- A. Furnish each aggregate material from a single source throughout the work.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Coarse Aggregate Type A1 (Utility Bedding, Haunching, & Initial Cover): Conforming to VDOT Std. #68, 7, or 78.
- B. Coarse Aggregate Type A2 (Drainage Fill): Conforming to VDOT Std. #57.
- C. Coarse Aggregate Type A3 (Base for Concrete Flatwork): Conforming to VDOT Std. #5, 56, or 57.
- D. Coarse Aggregate Type A4 (Aggregate Base under Bituminous Pavement): Conforming to VDOT Std. #21A or B, Type II (A or B as indicated in pavement sections on the Drawings).
- E. Course Aggregate "Rip-Rap" (as referenced on plans by d₅₀ value): A well graded rip-rap, in accordance with DCR and VDOT standards, consisting of field stone of approximately rectangular shape. Specific gravity of individual stones shall be 2.5 minimum. Mean stone diameter shall be as denoted by the "d₅₀" value. The diameter of the largest stone size shall not be larger than 1.5 times the d₅₀ size. The diameter of the smallest stone size shall not be smaller than 0.3 times the d₅₀ size. Small fines will not be permitted.

2.2 SOURCE QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Source testing and analysis of aggregate material.

- B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698.
- C. If tests indicate materials do not meet specified requirements, change material or material source and retest.
- D. Furnish materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 STOCKPILING

- A. Stockpile in sufficient quantities to meet Project schedule and requirements.
- B. Separate differing materials with dividers or stockpile apart to prevent mixing.
- C. Direct surface water away from stockpile site so as to prevent deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in a clean, neat, and stabilized condition. Grade site surface to prevent freestanding surface water.
- B. If a borrow area is utilized, leave area in a clean, neat, and stabilized condition. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 31 09 00
GEOTECHNICAL ENGINEERING, INSPECTION AND TESTING

PART 1 GENERAL

1.1 DESCRIPTION

- A. Earthwork quality assurance.
 - B. Underground utility quality assurance.

1.2 RELATED SECTIONS (including but not limited to:)

- A. Section 31 22 13 – Rough Grading.
 - B. Section 31 23 16 – Excavation.
 - C. Section 31 23 23 – Backfill.
 - D. Section 31 23 17 –Trenching.
 - E. Division 33 Underground Utility Sect

1.3 GEOTECHNICAL INVESTIGATION REPORT

- A. A geotechnical investigation report has not been prepared for the site of this work.
 - B. Bidders should visit the site and acquaint themselves with existing conditions.
 - C. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions, but such investigations may be performed only under time schedules and arrangements approved in advance by the Architect.

EARTHWORK QUALITY ASSURANCE

- A. A qualified independent Soils Testing Laboratory, which staffs a Professional Geotechnical Engineer, registered in Virginia (herein after Geotechnical Engineer), will be retained by the Owner to observe and report performance or work in connection with Rough Grading, Excavating, Backfill, & Trenching , and any other earthwork related concern.
 - B. The Geotechnical Engineer shall perform the following:
 1. Make a site inspection, review governing requirements for this work and the test results and make recommendations on applicable portions of the Work (traffic bearing areas, building foundation, etc., as may be applicable to this project),
 2. All required tests to determine bearing capacity of soil (subgrade suitability) prior to placement of all footings, slabs, utilities, etc.
 3. Inspections,
 4. Testing of all proof-rolling and filling operations.

- 5. Determination of materials (suitable, unsuitable, rock, etc., as may be applicable to this project),
 - 6. Quantify materials involving unit price payments as applicable,
 - 7. Submit certifications of all such tests and inspections as may be herein required, with a proper description of tested or inspected locations, to the Architect/Engineer with a copy to the Contractor. Location maps shall be submitted with each report identifying areas where testing occurred.

C. All testing performed by the Geotechnical Engineer is solely in the interest of and for the protection of the Owner.

D. The density of all finally placed or excavated material shall be as specified herein and as determined suitable by the Geotechnical Engineer.

E. The Contractor shall be responsible for notifying the Geotechnical Engineer of his readiness for all tests in a timely manner and for providing access to the site so as to cause no delay to the project.

F. All instructions and directions provided by the Geotechnical Engineer to the Contractor shall be in writing and immediately communicated to the Owner and Architect.

G. When a soils test requested by the Contractor fails to meet the requirements of these specifications, the cost of all re-testing required shall be borne by the Contractor.

H. Notwithstanding any tests, instructions, or decisions made by the Geotechnical Engineer, the Contractor shall not be relieved of his obligation to perform all grading and compaction work in accordance with the Contract Documents.

I. The Contractor may, at his option, hire his own Soils Testing Service to assure himself that his work is in accordance with the Contract Documents.

1.5 UNDERGROUND UTILITY QUALITY ASSURANCE

- A. Due to their involvement with related earthwork, the Geotechnical Engineer (see 1.4 A. above), retained by the Owner, will observe and report performance on work in connection with Underground Utility installation and testing.
 - B. The Geotechnical Engineer shall perform the following:
 1. Review governing requirements for installation of this work,
 2. Upon accepting condition of trench for pipe installation, observe placement of bedding, haunching, pipe, any anchorage or thrust blocking required, and initial cover to assure that pipe is installed in accordance with those requirements,
 3. Verification of appropriate pipe, joint, and fitting materials,
 4. Observation of all required tests to determine suitability of said pipe installation, and
 5. Submit certifications of all such inspections and observations as may be herein required, with a proper description of tested locations, to the

Architect/Engineer with a copy to the Contractor.

- C. All utility related work performed by the Geotechnical Engineer is solely in the interest of and for the protection of the Owner.
- D. The Contractor shall be responsible for notifying the Geotechnical Engineer of his readiness for all inspections and observations in a timely manner and for providing access to the site so as to cause no delay to the project.
- E. Approvals and Disapprovals provided by the Geotechnical Engineer to the Contractor shall be in writing and immediately communicated to the Owner and Architect/Engineer.
- F. When an inspection/observation requested by the Contractor fails to meet the requirements of these specifications, the cost of all re-inspection/observation required shall be borne by the Contractor.
- G. Notwithstanding any tests, instructions, or decisions made by the Geotechnical Engineer, the Contractor shall not be relieved of his obligation to perform all utility work in accordance with the Contract Documents.

PART 2 PRODUCTS: NOT USED

PART 3 EXECUTION: NOT USED

END OF SECTION

SECTION 31 10 00
SITE PREPARATION AND CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparation.
- B. Protection: Protect improvements and vegetation to remain within and beyond/outside limits of disturbance.
 - 1. Barriers, warnings, shoring, etc.
 - 2. Adjacent properties, waterways and the air
 - 3. Reference points,
 - 4. Existing improvements,
 - 5. Existing utilities, and
 - 6. Trees and vegetation.
- C. Demolition, Clearing & Grubbing:
 - 1. Remove surface debris.
 - 2. Demolish and remove existing site improvements. Designated paving and curbs.
 - 3. Clear site of plant life and grass.
 - 4. Remove trees and shrubs, including root systems, unless designated to remain.
- D. Topsoil Stripping: Excavate and stockpile topsoil.
- E. Removal: Clean up, remove and dispose of undesirable material off-site.
- F. Restoration: Restore existing finished surfaces disturbed to that of proposed finishes (preconstruction condition as a minimum).
- G. Utility Adjustments: Adjust new and existing utility tops to meet proposed finish grades.
- H. Definitions.
- I. Project Record Documents.

1.2 RELATED SECTIONS (including but not necessarily limited to)

- A. Division 01: Permits, Fees, & Notices: Land Disturbing Permit.
- B. Division 01: Temporary Utilities: Water Service.
- C. Division 01: Temporary Controls: Surface Water and Dewatering. Dust. Noise. Air pollution.
- D. Section 31 09 00 – Geotechnical Engineering, Inspection, & Testing. Geotechnical Engineer.

- E. Section 31 05 13 – Soil Materials: Definitions of subsoil and topsoil materials.
- F. Section 31 22 13 – Rough Grading: Site subgrade contouring. References this section for Preparation, Protection, and Clean up, Removal and Disposal.
- G. Section 31 25 13 - Erosion and Sediment Control: Requirements for land disturbance, protection of stockpiles topsoil.
- H. Section 32 91 19 - Landscape Grading: Coordination of soil materials stockpile removal for finish grading and preparation for landscaping/seeding.

1.3 REFERENCES

- A. Virginia Erosion & Sediment Control (ESC) Manual, latest edition: Temporary seeding, construction entrances and other measures or practices which may apply.
- B. Virginia Department of Health (VDH) "Waterworks Regulations", latest edition: Well or Monitoring Well abandonment.
- C. Virginia Department of Transportation (VDOT) "Road & Bridge Standards & Specifications", latest edition: Safety Items.
- D. Manual on Uniform Traffic Control Devices (MUTCD), latest edition (including the Virginia Supplement): Pavement Marking and Signage within right-of-way.

1.4 REGULATORY REQUIREMENTS

- A. Conform to all applicable codes. These include but shall not be limited to those pertaining to erosion and sediment control and disposal of debris.
- B. Obtain all required permits from authorities having jurisdiction.
- C. Erosion & Sediment Control (ESC): See Section 31 25 13 - Erosion & Sediment Control for plan preparation, review, approvals, regulatory requirements, etc.
- D. Utility Companies: Administrative Requirements: Coordination & Meetings: Coordinate clearing Work with utility companies. Verify locations of existing utilities. Notify them prior to starting and comply with their requirements.
- E. Existing Signage within Right-of-Way: Any existing signs shall be relocated as necessary meeting all state and local ordinances including conformance in design and placement with the Virginia Supplement to the Manual on Uniform Traffic Control Devices (MUTCD), latest edition. Edge of signs shall be 12 feet off edge of pavement or 6 feet off shoulder or 2 feet behind face of curb. Clear height shall be 7 feet above grade. Reference document shall take precedence.

1.5 DEFINITIONS

- A. Limit of Disturbance or Construction Limits: The extent that proposed contours, erosion and sedimentation control measures, subsurface utility work and surface improvements are indicated on the Drawings or as delineated as limits on

Drawings plus Contractor trailer, storage and parking as defined in the Contract Documents.

1.6 PROJECT RECORD DOCUMENTS

- A. Accurately record on Project Record Documents the actual locations of utilities to remain, by horizontal dimensions from landmarks to remain, depth or elevations of inverts, and slope gradients while preparing for land disturbance and in providing protection of utilities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Erosion and Sediment Control Materials: See Section 31 25 13 - Erosion and Sediment Control for approved materials and products.
- B. See Section 31 05 13 – Soil Materials: Definitions of subsoil and topsoil materials.

PART 3 EXECUTION

3.1 PREPARATION

- A. Accept premises as found. Owner assumes no responsibility for conditions of site or continuation of conditions existing at time of advertisement.
- B. Assure that all pertinent required permits have been obtained.
- C. Verify all site conditions pertinent to this work.
- D. Locate, identify and flag/mark for protection all bench marks, property corners and reference points. Verify that survey bench mark and intended elevations for the Work are as indicated.
- E. Contractor shall lay out all work and be responsible for all lines, elevations and measurements.
- F. Verify that existing trees/plant life designated to remain, are conspicuously marked as such.
- G. Drawings do not purport to show all objects existing on the site. Before commencing work, verify with the Architect all improvements to be protected, salvaged, relocated, removed or demolished. Existing utilities are indicated on the Drawings in accordance with available records.
- H. Before any work is started, the Contractor shall contact all corporations, companies, individuals and local authorities owning, maintaining or regulating utilities, conduits, wires and pipes running to or on the property to make suitable arrangements for locating, protection, handling, relocation, adjusting, and/or removal and disposal/salvage of such lines or structures. Verify locations and elevations.

- I. Contact MISS UTILITY at least 48 hours in advance of land disturbing activities.
- J. Before any work is started, the Contractor shall contact all state and local authorities owning, maintaining or regulating adjacent rights-of-way to make suitable arrangements for protection, handling, relocation, and/or removal and disposal/salvage of such improvements involved in this Work (signs, structures, etc.). Verify locations, elevations and applicable codes.

3.2 PROTECTION

- A. General: Erect and maintain temporary bracing, shoring, lights, barricades, warning signs, etc., all in accordance with applicable rules and regulations.
- B. Protection of adjacent properties, waterways and the air:
 - 1. Prior to any land disturbance activity install Erosion and Sediment Control measures conforming to Section 31 25 13 - Erosion and Sediment Control (ESC). See Site Drawings for specific practices required to prevent soil from washing from areas disturbed during clearing operations. Maintain all ESC measures required.
 - 2. Clearing shall be restricted to the area within the right-of-way, easements, and Construction Limits indicated on the Drawings.
 - 3. Any material which will result in dust shall be wet down during removal.
- C. Protection of Reference Points: Protect and maintain all bench marks, property corners, monuments and other reference points from damage or displacement. Do not cover. Obtain accurate replacement of any that is disturbed, destroyed or moved due to the work and furnish a certificate by a professional civil engineer or land surveyor that all such items have been relocated accurately.
- D. Protection of Existing Improvements:
 - 1. Conduct site clearing operations to ensure minimum interference with roads, streets, walks, utilities, and other adjacent improvements to remain. Do not close or obstruct streets, walks or other facilities without written permission from authorities having jurisdiction and prior approval by the Owner.
 - 2. Use all means necessary to protect existing improvements designated to remain. In the event of damage, immediately make all necessary repairs and replacements as directed by the Architect.
 - 3. Existing flagpole and base is designated to remain in current location and undisturbed during the Work.
 - 4. Existing concrete signal pole base is to be utilized for the project. Use all means necessary to protect during the Work.

Protection of Existing Utilities:

- 1. Existing utilities, encompassing all water systems, storm and sanitary sewer systems, gas lines, electric systems, telephone and communication systems, underground storage tanks, etc., and all accessories thereto, underground, on the surface or overhead, located in or affected by the construction of the work shall be relocated as required
- 2. Protect existing utilities noted to remain.

3. Coordinate the timing of utility adjustments to ensure that all new and existing utility tops are adjusted to proposed finish grades prior to stone base applications in paved areas, and prior to topsoil applications within lawn spaces.
4. Give advance notice to the Utility Owner of work to be removed or relocated. The work shall be performed by the Contractor or Utility Owner with arrangements and payment for this work being made by the Contractor.
5. If existing concealed utilities not shown or correctly indicated by the Contract Documents are encountered, the Contractor shall stop work in that area and notify the Architect and Utility Owner. Do not proceed until written instructions are received from the Architect.
6. The Contractor shall excavate with care to determine the exact location of existing utilities, including sizes and inverts. Also, stake and flag at this time for protection. This work shall precede pipe laying, grading, excavation and other construction as far as practicable, to permit adjustments where required.

F. Protection of Existing Trees and Vegetation:

1. Contractor shall assume that all existing vegetation on the premises is intended to remain unless specifically noted otherwise.
2. Protect existing trees, plant growth, and features against compacting the root zone, unnecessary cutting, breaking, skinning of roots, or bruising of bark, or damage from dust, debris, or chemicals. Conform to details and specifications of the Virginia Erosion & Sediment Control Handbook for methods of protection.
3. Disposal of any adhesives, concrete, plaster, paints, thinners, or other volatile liquids or substances detrimental to vegetation shall be done in proper locations away from existing or new plant materials.
4. Repair or replace trees and vegetation damaged by construction operations, but not intended for demolition, in a manner acceptable to the Architect

3.3 DEMOLITION, CLEARING AND GRUBBING

- A. Removal of utilities may cause excavations beneath proposed buildings and improvements. All excavations performed for demolition purposes shall be backfilled and tested in accordance with the specifications.
- B. Clear areas required for access to site and execution of Work. Honor described or indicated Limits of Construction and Disturbance.
- C. Remove existing walks, pavement, fencing, curbs, minor buildings and structures where required for excavation or new construction or as indicated on the Site Drawings. Existing pavement to be removed or connected to shall be neatly cut in straight lines at necessary locations required to accomplish required work. Existing pavement to be trenched through by the open cut method shall be neatly cut in straight lines at minimum width required to accomplish required work.
- D. Where asphalt or concrete walks or pavement are removed in locations proposed

as lawn or planting beds, all existing bedding stone shall be removed. Underlying subsoil shall be loosened and prepared to receive fill, topsoil, or mulch as applicable.

- E. Upon encountering and well within limits of disturbance, verify first with A/E that well is not in use and that Owner desires it to be formally abandoned. If so desired Contract price will be adjusted by Change Order. Abandon well in accordance with Virginia Department of Health "Waterworks Regulations", Section 3.8 - Observation, Monitoring and Remediation Wells and Section 3.11 - Well Abandonment. Adjust top elevation of casing as required to maintain three (3) feet of cover from finished grade.
- F. Abandon in place, in accordance with applicable codes, all utility lines not intended to remain, if it poses no conflict with the Work, will have three (3) feet of cover at finished grade and, in the opinion of the Architect, remaining in place does not have an adverse impact upon the project or intended use.
- G. Remove utility lines & structures which conflict with the work or do not meet the preceding conditions. Provide for the relocation, raising or lowering of existing electric and telephone poles where required.
- H. Remove grass, trees, stumps, shrubs, roots, vines, weeds, brush, surface rocks, debris and all other extraneous material or objects from areas to be built upon or graded. Remove all vegetation to a sufficient depth to prevent regrowth.
- I. Conduct demolition, clearing and grubbing operations in such a manner as to minimize disturbance to subsoil and creation of dust. Remove existing foundation walls, floor slabs and footings in such a manner as to avoid disturbing underlying subgrade.
- J. Where trees are indicated to be left standing, stop topsoil stripping at drip line to prevent damage to main root system. Use only hand grubbing inside the driplines of trees to remain.
- K. Fill depressions caused by demolition, clearing and grubbing operations with controlled fill unless further excavation or grading is indicated and immediately follows.
- L. Do not allow water to pond in any excavation or depression. See Dewatering in Division 01: Temporary Controls.

3.4 STRIPPING TOPSOIL

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded as indicated on the Drawings. Excavate to whatever depths encountered in a manner to prevent intermingling with underlying sub-soil or other objectionable material. Comply with the following:
 1. Do not excavate wet topsoil.
 2. Avoid including debris, stones and other extraneous matter in topsoil which will make it "unsuitable" under Section 31 05 13 – Soil Materials: Topsoil

Materials.

3. Leave subsoil surface free of trash, debris and foreign materials.
- B. Stockpile on site in an area approved by the Architect/Engineer. Comply with Section 31 25 13 - Erosion & Sediment Control; Topsoil Stockpile.

3.5 CLEANUP, REMOVAL & DISPOSAL

- A. Clean up debris resulting from site clearing and grading operations (earthwork related) continuously with the progress of the Work.
- B. Remove debris, rock, extracted plant life, unsatisfactory, and/or surplus (not being reused) soil materials, etc. from site.
- C. Any debris, rock, extracted plant life, etc. designated to be removed from the site shall become the property of the Contractor and shall be disposed at the Contractor's expense.
- D. Dispose of all material in accordance with all local, state and federal regulations governing same.

END OF SECTION

SECTION 31 22 13 ROUGH GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Site Subgrade Contouring. General cutting, grading, filling, and rough contouring of the site for site structures, paving, building pads, landscaping features, etc., as applicable.
- B. Furnish all labor, materials, equipment, and incidentals necessary for earthmoving, grading, cutting, filling, and compaction to provide subgrade elevations as specified herein from finish grades indicated on the Drawings.
- C. Unauthorized excavation defined.

1.2 RELATED SECTIONS

- A. Section 31 05 13 - Soil Materials.
- B. Section 31 05 16 - Aggregate Materials.
- C. Section 31 10 00 - Site Preparation and Clearing.
- D. Section 31 23 16 - Excavating: Building excavation.
- E. Section 31 23 23 - Backfilling: General building area backfilling.
- F. Section 31 23 17 - Utility Trenching & Backfilling: Trenching and backfilling for utilities.
- G. Section 32 91 19 - Landscape Grading: Finish grading with topsoil to contours.

1.3 REFERENCES

AMERICAN SOCIETY OF TESTING & MATERIALS

- A. ASTM C136 - Method For Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
- C. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- D. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- E. ASTM D2419 - Test Method For Sand Equivalent Value of Soils and Fine Aggregate.

- F. ASTM D2434 - Test Method For Permeability of Granular Soils (Constant Head).
- G. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- H. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.4 DEFINITIONS

- A. "Finish grade" refers to contours and spot grades indicated on the Drawings.
- B. "Subgrade" or "rough grade" refers to bottom of footings at foundation walls and columns, bottom of aggregate fill within trenches or under slabs-on-grade and paving, and finish grade less specified topsoil depth elsewhere. Refer to applicable Drawings and Schedules for distances below finish grade. "Subgrade" may also refer to the subsoil base upon which fill is to be placed
- C. "Unsuitable material" refers to any material beneath proposed subgrade in cut conditions and existing subgrade in fill conditions which in the opinion of the Geotechnical Engineer, after observing proof-rolling or other testing/observation, will not be a satisfactory base for supporting the proposed work above. The Contractor will not be compensated for removal and replacement of soils that have become "unsuitable" due to inadequate protection from the elements and/or construction traffic.

1.5 CLASSIFICATION OF EXCAVATION

- A. All cutting, filling, excavating and backfilling to the limits of rough grade as defined herein is "unclassified". It shall be the Contractor's responsibility to determine the subsurface character. Bidders are expected to examine the site and then decide for themselves the character of materials to be encountered. Claims for extra compensation arising from latent, subsurface conditions within the project area will not be considered.
- B. Excavation beyond the indicated subgrade elevations or excavation side dimensions shall be replaced at Contractor's expense with material per schedule this section.

1.6 SUBGRADE SUITABILITY

- A. The Geotechnical Engineer shall inspect all subgrades below footings and below slabs on grade and the results of such inspections shall be reported to the Architect and Owner.
- B. As determined by the Geotechnical Engineer, any unsuitable material below limits of subgrade elevations shall be removed and replaced per schedule this section. Contract Price will be adjusted by Change Order except as indicated in "C" below.

- C. Once any subgrade has been approved by the Geotechnical Engineer for pouring of footings, slabs, etc., placing of concrete should occur the same day. If the placing of concrete is delayed by the Contractor, for any reason, resulting in subsequent disapproval of said subgrade by the Geotechnical Engineer, any additional excavation required as a result of such subsequent disapproval shall be provided by the Contractor at no additional cost to the Owner. Contractor shall be responsible for protecting subgrades with flowable fill or overlaid clay soil if footing installation is delayed or rainfall is anticipated.

1.7 PROJECT RECORD DOCUMENTS

- A. With the request for payment where completion of grading and site utilities are indicated provide the following satisfactory evidence that grades and utility installations are in accordance with the Contract Drawings. Upon completion of landscape grading and utility installation have the certified land surveyor doing the construction stakeout create a composite survey covering all area disturbed during the Work. The Contractor shall provide spot grades at each of these points (located within 1 foot horiz. by scaling unless sufficient dimensions are provided on the Drawings to be exact). This data shall be provided as an electronic file of a Record Document layer in the version of AutoCad used to produce the Contract Drawings and capable of being inserted into our file as that independent layer. Provide descriptions of points other than lawn grade shots where provided. Provide same descriptive content for points and structures as used in Contract Drawings. Also submit a sealed reproducible plot of the survey data to the Architect/Engineer.
1. Verify all finished spot grades indicated on the Contract Drawings (Civil) as well as vertical control points (benchmarks). Also,
 2. For general lawn areas provide spots at tops and toes of slopes and along swale centerlines at no greater than 100' increments (2 spots minimum).
 3. For buildings, accurately locate building and provide finished floor elevation.
 4. For parking areas provide spot grades wherever provided on plans.
 5. For culverts, storm sewers and sanitary sewers provide tops of structures and invert, size and type of all pipes.
 6. For other utilities provide location of all visible structures.
 7. Comply with Section 311000 - Site Preparation and Clearing pertaining to Project Record Documents (utility locations) for any further existing utilities discovered under the work of this Section. Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or invert, and slope gradients. Provide thorough descriptions of these utilities (type, size, material, active/abandoned, etc.).

PART 2 PRODUCTS

2.1 MATERIALS

- A. Topsoil: Type T1 or T2 as specified in Section 31 05 13.
- B. Subsoil Fill: Type S1 as specified in Section 31 05 13.
- C. Structural Fill: Type S1 as specified in Section 31 05 13.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01 30 00 – Administrative Requirements: Coordination.
- B. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.2 PREPARATION, PROTECTION, & CLEANUP

- A. Control water in accordance with Division 01 – Temporary Controls. Ponding water will not be permitted.
- B. Comply with Section 31 10 00 - Site Preparation & Clearing: Preparation, Protection, Field Measurements, Cleanup.
- C. The Contractor shall be responsible for controlling on-site construction traffic to prevent softening or rutting of completed controlled fill work. Additional work required due to improper traffic control will be at the Contractor's expense.
- D. Identify required lines, levels, contours, and datum.
- E. Locate, identify, and protect above and below grade utilities that remain, from damage.
- F. Notify utility company to remove and/or relocate utilities, as applicable.
- G. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- H. Protect bench marks, survey control points, any existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 PROOF-ROLLING

- A. After all demolition, clearing, grubbing, and topsoil and organics stripping the exposed subgrade shall be proof-rolled. Proof-rolling shall be with a tandem axle dump truck or similar pneumatic tired equipment weighing at least 10 tons (20

- tons max) to locate soft or other unsuitable areas. The number and direction of passes shall be as required by the Geotechnical Engineer.
- B. Any soft or compressible areas or unsuitable material encountered shall be removed and replaced per schedule this section. The Geotechnical Engineer shall observe the removal, document the volume, observe and test the replacement and immediately forward copies of documentation to the Architect/Engineer.
 - C. Unless approved by the Geotechnical Engineer proof-rolling shall be a continuous operation until the entire site is complete.
 - D. When extensive excavation is required to bring the site to rough grade, proof-rolling shall occur simultaneously with the excavation work, if possible.
 - E. The Contractor shall provide assistance to the Geotechnical Engineer or his representative as required to accomplish this work and to accurately track the progress of proof-rolling.
 - F. After proof-rolling the subgrade, areas to receive fill shall be uniformly scarified to a depth of 2". Water shall be added to the loosened material or it shall be allowed to dry as required so that the moisture content is within necessary limits of the optimum as judged or tested by the Geotechnical Engineer.

3.4 SUBSOIL EXCAVATION (Cutting)

- A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded.
- B. Work within 15 feet of any structure to remain shall be handled under Section 31 23 16 – Excavating & Filling. Should the Architect or Geotechnical Engineer determine the structure to be in jeopardy by grading operations this distance may be increased.
- C. Do not excavate wet subsoil unless determined to be "unsuitable material" and its removal has been approved by the Geotechnical Engineer.
- D. When excavating through roots of trees to remain, perform work by hand and cut roots with sharp ax.
- E. If rock is encountered, it shall be excavated to 6" below rough grade and replaced per schedule this section.
- F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.5 STOCKPILING

- A. Stockpile suitable excavated material per Section 31 25 13 - Erosion & Sediment Control: Topsoil/Soil Materials Stockpile.

- B. Stockpile in sufficient quantities to meet Project schedule and requirements. Stockpile materials on site at locations acceptable to Architect/Engineer. Avoid drainage ways and drip areas of trees. Remove excess material and material unsuitable for reuse as fill from site.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Prevent intermixing of soil types or contamination.

3.6 FILLING

- A. Before fill is placed, existing grade shall be prepared as specified in Section 31 10 00, shall be dry and clean of all debris, and shall be proof-rolled in accordance with this section.
- B. Scarify proof-rolled, existing subgrade to a depth of 2" prior to placing fill.
- C. All fill materials shall be tested and approved by the Geotechnical Engineer prior to placement and shall meet or exceed the requirements as specified in schedule this section.
- D. Place fill to subgrade contours and elevations allowing for later placement of topsoil and pavements.
- E. Furnish additional fill material from off site if required to complete the work. Fill material from off-site is subject to approval of the Architect and Geotechnical Engineer.
- F. Filling operations for embankments having a slope greater than 1' vertically to 4' horizontally or other similar areas noted on the site plan shall be stepped or benched in 8" vertical lifts. Carry fill slope at least three feet horizontally beyond design rough grade, then cut back to well compacted material at subgrade elevations indicated on the Drawings. Divert surface runoff around fill slopes with diversions or slope drains as required until vegetation is established.
- G. Do not place fill in water or mud or on frozen or frosty ground.
- H. Surfaces of new grades shall be left clean and ready to receive applicable finished surface. Remove all ruts and depressions to give a smooth and uniform subgrade.
- I. To avoid delay of the project, when wet weather will not permit placement of soil fill material under the building area, Contractor will be permitted the option of using structural fill type A3 or as acceptable to the Geotechnical Engineer, as the fill material at no additional cost to the Owner.
- J. Fill areas to contours and elevations with unfrozen materials.

- K. Place fill material on continuous layers and compact in accordance with the schedule at end of this section.
- L. Maintain optimum moisture content of fill materials to attain required compaction density.
- M. Slope grade away from building minimum 5 inches in 10 ft, unless noted otherwise.
- N. Make grade changes gradual. Blend slope into level areas.
- O. Remove surplus fill materials from site.

3.7 RESTORATION OF GRADES

- A. Restore to original grades and conditions all properties damaged by any activity related to this work and take adequate precautions to avoid settlements or cave-ins of properties higher than site, and settling, eroding or other damage to properties lower than site.
- B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

3.8 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus 0.1 foot within 100 feet of buildings, under all pavement and site improvements (such as athletic/play fields); and 0.25 foot on surrounding fields and slopes.

3.9 COMPACTION OF FILLS

- A. Required compaction tests shall be carried out according to ASTM D698 Standard Proctor Test by the Geotechnical Engineer.
- B. Field testing methods shall be as determined by the Geotechnical Engineer.
- C. Contractor shall be responsible for notifying Geotechnical Engineer as each lift is installed. Contractor shall not place additional lifts until tests indicate the fill is compacted to specified densities. Should any lifts be placed prior to approval of lower lifts, the work shall be removed at no additional cost to the Owner.
- D. Materials and densities shall be in accordance with schedule this section.
- E. The moisture content of the fill material shall be within 3% of the optimum range for maximum compaction during compaction. Add water as required. If excess water exists, it shall be reduced by harrowing, dicing and natural evaporating.

3.10 FIELD QUALITY CONTROL

- A. Testing: In accordance with ASTM D698.

B. Work performed which does not meet technical or design requirements as determined by the Geotechnical Engineer will be removed, replaced and retested at no additional cost to the Owner. No deviations from the Contract Documents shall be permitted without specific and written approval from the Architect/Engineer.

C. Thickness of lifts prior to compaction and distribution of tests, unless otherwise required by the Geotechnical Engineer, shall be accordance with the following table:

AREA	MAX. LIFT THICKNESS	TEST DISTRIBUTION (PER LIFT)
Lawn & unpaved areas	8"	1 per 10,000 s.f.
Backfills (Exterior)	8"	1 per 2,500 s.f.
Embankments (3H:1V & >)	8"	1 per 2,500 s.f.
Under Paving, Curbs, Walks, Footings, and Slabs on Grade	8"	1 per 1,000 s.f.

D. Lift thickness given are for heavy compaction equipment. If hand operated equipment is used then lift thickness shall be one-half of those given above.

E. Test distributions are minimum requirements with more required if deemed necessary by the Geotechnical Engineer. If fill area is linear in shape and less than 50' wide, provide one (1) test per 50 linear feet of the fill areas.

F. Density requirements under slabs, footings and pavement shall be carried ten feet (10') beyond exterior edges.

3.11 STOCKPILE CLEANUP

- A. Comply with Section 32 91 19 - Landscape Grading for finish grading and preparation of stockpile areas for landscaping/seeding.
- B. Comply with state and local erosion and sediment control ordinances by having stabilized all disturbed areas at completion of work.

3.12 SCHEDULES

- A. Fill Under Building Interior Slab-On-Grade to 10 Feet Outside:
 1. Fill Type S1, to subgrade elevation, compacted to 95 percent,
 2. Inside foundation wall cover with Fill Type A3 (Base for Concrete Flatwork), 6 inches thick (unless detailed otherwise), compacted to 95 percent.

- B. Fill Under Grass and Landscape Areas:
 - 1. Fill Type S1, to specified depth of topsoil below finish grade, compacted to 90 percent. See Section 32 91 19 - Landscape Grading for topsoil depth.
- C. Fill Under Vehicular Asphalt or Concrete Paving, Pavers, Curbs and Concrete Dumpster Pad:
 - 1. Compact subsoil to 95 percent of its maximum dry density.
 - 2. Fill Type S1, to within two (2) feet of pavement subgrade, compacted to 95 percent.
 - 3. Fill Type S1, to pavement subgrade as indicated in applicable pavement section or schedule description, compacted to 98 percent.
- D. Fill Under Non-Vehicular Concrete Paving or Pavers (Walks):
 - 1. Compact subsoil to 95 percent of its maximum dry density.
 - 2. Fill Type S1, to pavement subgrade as indicated in applicable pavement section or schedule description, compacted to 95 percent.
- E. Fill to Correct Over-excavation:
 - 1. Lean concrete to minimum compressive strength of 1000 psi, OR
 - 2. Fill Type A4, flush to required elevation, compacted to 95 percent.

END OF SECTION

SECTION 31 23 16 EXCAVATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Excavating for building foundations.
- B. Excavating for slabs-on-grade, curbing, walks, landscaping, etc.
- C. Excavating for site structures.

1.2 RELATED SECTIONS

- A. Section 31 09 00 - Geotechnical Engineering, Inspection, and Testing
- B. Section 31 22 13 - Rough Grading: Classification of excavation. Topsoil and subsoil removal from site surface.
- C. Section 31 23 23 - Backfilling.
- D. Section 31 23 17 - Utility Trenching & Backfilling: Excavating for utility trenches.
- E. Section 31 25 13 - Erosion & Sediment Control: Slope protection and erosion control.

1.3 DEFINITIONS

- A. Finish grade refers to contours and spot grades indicated on the Drawings.
- B. Subgrade or rough grade refers to bottom of footings at foundation walls and columns, bottom of crushed stone fill within trenches or under slabs-on-grade and paving, and finish grade less specified topsoil depth elsewhere. Refer to applicable Drawings and Schedules for distances below finish grade. Subgrade may also refer to the subsoil base upon which fill is to be placed.
- C. Where rock is encountered, Contractor shall over-excavate 6 inches below defined subgrade. If rock seam less than 4' in length is encountered below building foundation subgrade, Contractor shall over-excavate 12" below defined subgrade and backfill with A4 aggregate compacted to 98%.
- D. Unsuitable material refers to any material beneath proposed subgrade in cut conditions and existing subgrade in fill conditions, which in the opinion of the Geotechnical Engineer, after observing proof-rolling or other testing/observation, will not be a satisfactory base for supporting the proposed work above.

PART 2 – PRODUCTS: Not Used

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that survey bench mark and intended elevations for the Work are as indicated. Identify required lines, levels, contours, and datum locations.

3.2 EXCAVATING

- A. Underpin adjacent structures which may be damaged by excavating work.
- B. Work within 15 feet of any structure to remain shall be handled under Excavation. Should the Architect or Geotechnical Engineer determine the structure to be in jeopardy by grading operations this distance may be increased.
- C. Excavate subsoil to accommodate building foundations, slabs-on-grade, curbing, and site structures, construction operations, etc.
- D. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Section 31 23 23.
- E. Slope banks with machine to angle of repose or less until shored.
- F. Do not interfere with 45 degree bearing splay of foundations.
- G. Grade top perimeter of excavation to prevent surface water from draining into excavation. Hand trim excavation. Remove loose matter.
- H. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- I. Do not excavate wet subsoil unless authorized as "unsuitable material" and its removal has been approved by the Geotechnical Engineer.
- J. When excavating through roots, perform work by hand and cut roots with sharp ax.

3.3 TOLERANCES

- A. Bottom of Footings: Excavate in excess of required dimension on detail from true line and grade.
- B. Sides of Footings: Excavate in excess of required dimension on detail from centerline of true alignment.
- C. Excavation for Misc. Structures: Plus or minus 0.04 foot (0.5 in) from true line and grade.

3.4 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Assurance: Field inspection and testing. Geotechnical Engineer.
- B. Prevent soil in excavated areas previously considered suitable from becoming "unsuitable" due to rainfall or surface runoff and ponding. Measures to protect subgrade shall include, but not be limited to, delaying final excavation of bottom 8" of material to just prior to finished product placement, or installing a protective layer of lean concrete.
- C. Provide for visual inspection of bearing surfaces. Place no footing until soil bearing capacity has been verified by the Geotechnical Engineer.

3.3 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 31 23 17
UTILITY TRENCHING AND BACKFILLING

PART 1 GENERAL

1.1 SECTION INCLUDES (But is not limited to)

- A. Excavating trenches for utilities from inlets to indicated points of connection to municipal utilities, source, outfall, etc., as applicable.
- B. Compacted backfill from top of utility cover bedding/initial backfill to subgrade elevations.
- C. Replacing pavement and pavement patching where disturbed by utility trenching.

1.2 RELATED SECTIONS

- A. Section 31 09 00 - Geotechnical Engineering, Inspections, and Testing.
- B. Section 31 05 13 - Soil Materials.
- C. Section 31 05 16 - Aggregate Materials.
- D. Section 31 10 00 - Site Preparation and Clearing: Preparation for land disturbance. Protection of the work. Demolishing structures. Clearing and grubbing. Stripping and stockpiling topsoil.
- E. Section 31 22 13 - Rough Grading: Subgrade Suitability, Correction of Over-excavation.
- F. Section 32 91 19 - Landscape Grading: Depth of topsoil.
- G. Division 33 - Water, Sanitary Sewer, Storm Drainage, Foundation Drainage Sections, as applicable.
- H. Division 23 – Underground Natural Gas, Refrigerant, etc., as applicable.
- I. Division 26 - Underground Electrical Conduits

1.3 REFERENCES

- A. VDOT "Special Provision for Flowable Backfill" dated March 11, 2010.
- B. Virginia Department of Transportation "Road & Bridge Standards & Specifications", latest edition. VDOT section numbers referenced herein refer to sections in these Road & Bridge Specifications. The provisions therein for method of measurement and payment do not apply.
- C. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- D. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.

- E. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.4 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.
- B. Bedding: Fill placed under pipe to provide support.
- C. Haunching: Fill placed from bedding to spring line of the pipe, also considered bedding, which further supports pipe in both the horizontal and vertical.
- D. Cover Bedding/Initial Backfill: Fill placed above haunching to protect pipe prior to further backfill.

1.5 FIELD MEASUREMENTS

- A. Verify that survey bench mark, control point, and intended elevations for the Work are as shown on the Drawings.

1.6 COORDINATION

- A. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.

1.7 PROJECT RECORD DOCUMENTS

- A. Accurately record on Project Record Documents the actual locations of existing utilities encountered, by horizontal dimensions, elevations or inverts, and general direction.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Backfill: Type S1 as specified in Section 31 05 13 – Soil Materials.
- B. Coarse Aggregate (Utility Bedding): Type A1 as specified in Section 31 05 16 - Aggregate Materials.
- C. Flowable Backfill: As specified in VDOT "Special Provision for Flowable Backfill" dated March 11, 2010.
- D. Concrete: Lean concrete with a compressive strength of 1,000 psi.

2.2 ACCESSORIES

- A. Buried Utility Warning and Identification Tape: Provide detectable aluminum foil plastic-backed tape or detectable magnetic plastic tape or manufactured specifically for warning and identification of buried piping. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 3 inches minimum width, color coded for the utility involved, with warning and identification

imprinted in bold black letters continuously over entire tape length. Warning and identification shall be "CAUTION BURIED WATER LINE/SANITARY SEWER/STORM SEWER BELOW" or similar, as applicable. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material.

- B. Should Local Governing Authority require separate Detection Wire and Warning/Identification Tape, meet the local requirements regarding materials, function, and placement.

2.3 ASPHALT PAVEMENT REPLACEMENT

- A. Where not covered under general specifications for asphaltic pavement, these guidelines shall be followed. Reference Pavement Sections and Details on the Drawings.
- B. Aggregate for Base Course: Type A4 as specified in Section 31 05 16 – Aggregate Materials for Base under Bituminous Pavement.
- C. Primer/Tack Coat: In accordance with VDOT Section 211, RC-250 liquid bituminous material.
- D. Asphalt: In accordance with VDOT Section 212.17, Type SM-9.5AL and BM-25.0 bituminous concrete.
- E. Where concrete curb or curb and gutter is encountered, asphalt shall be removed and replaced, but concrete shall be left intact and tunneled under for utility installation and backfilled according to this section, if possible without causing damage to or movement of existing work. If damage is determined, curb or curb and gutter shall be replaced at no additional cost to the Owner.

PART 3 EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Verify that all prerequisite work has been completed. Verify location and elevation of points of connection. Notify Miss Utility.
- C. Protect plant life, lawns and other features remaining as a portion of final landscaping.
- D. Protect bench marks, and any existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities which are to remain.

3.2 EXCAVATING

- A. Excavate subsoil required for utilities from origin to destination as indicated.

- B. Cut trenches sufficiently wide to enable safe installation and allow inspection. Remove water or materials that interfere with Work.
- C. Install trench forms of sufficient height and minimum width to reduce the amount of lateral excavation. Portions of excavations may approach adjacent property lines, pins, landscaping and tree root systems which shall be protected.
- D. Do not interfere with 45 degree bearing splay of foundations or as otherwise indicated by Geotechnical Engineer.
- E. Hand trim excavation, including joints, as necessary. Remove loose matter.
- F. Remove any lumped subsoil, large stones, or other hard matter which could damage pipe or impede consistent backfilling or compaction.
- G. Cut out soft areas of subgrade not capable of compaction in place. See Section 31 22 13 – Rough Grading for Subgrade Suitability. Backfill per schedule this section.
- H. Correct areas over-excavated in accordance with Section 31 22 13 – Rough Grading.
- I. Stockpile excavated material, if suitable for use and required for rough grading, in area designated on site, and remove excess material from site.

3.3 BEDDING & HAUNCHING

- A. Place Geotextile fabric, if applicable, as indicated in details in coordination with appropriate lifts of fill.
- B. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place bedding and haunching to spring line of pipe and compact material in equal continuous layers not exceeding 8 inches compacted depth.

3.4 BACKFILLING

- A. Backfill trenches with unfrozen fill materials per applicable utility trench section to proposed subgrade per finished contours and elevations allowing for topsoil or pavement as applicable.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Backfill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
- D. Employ a placement method that does not disturb or damage utilities in trench or any adjacent work.
- E. Maintain optimum moisture content of fill materials to attain required compaction

- density.
- F. Place Buried Utility Warning and Identification Tape continuous over each separate run of piping. Bury tape with printed side up and at the location indicated in the trench sections on the Drawings.
 - G. Remove surplus fill materials from site.
 - H. Leave fill material stockpile areas completely free of excess fill materials and restore to applicable proposed finished surface condition.

3.5 COMPACTING

- A. Percentage of maximum density requirements:
 - 1. Compact virgin subsoil (bottom of excavated trench) and each layer of backfill due to over-excavation to 95 percent of maximum dry density at +/-3% optimum moisture content as determined by ASTM D698 (Standard Proctor).
 - 2. Compact each layer of backfill to not less than the scheduled percentages of maximum dry density at +/-3% optimum moisture content as determined by ASTM D698 (Standard Proctor).
- B. Equipment: Use power-driven hand tampers for compacting materials adjacent to structures and in trenches. Provide equipment capable of adding moisture to the soil material or for aerating the soil as determined necessary by moisture-density tests.
- C. Moisture Conditioning: Uniformly apply water in such a manner as to prevent free water appearing on the surface, either during or subsequent to compaction operations. Compaction by flooding is prohibited.
- D. Re-fill, re-grade and re-finish any area that becomes unsatisfactory due to freeze-thaw, erosion or settling. All areas or portions thereof that do not meet minimum density requirements shall be reworked and compacted until they meet the project density requirements.

3.6 TOLERANCES

- A. Top Surface of General Backfilling: Plus or minus 1 inch (0.08 ft) from required elevations, unless otherwise required in 3.9 - Schedule.
- B. This tolerance shall not relieve the Contractor from providing minimum sections of finish surfaces or meeting critical spot grades shown on drawings.

3.7 FIELD QUALITY CONTROL

- A. Compaction testing will be performed in accordance with ASTM D698 (Standard Proctor) and ASTM D3017 (Moisture Content).
- B. Field testing methods shall be as deemed appropriate by the Project Geotechnical Engineer.
- C. Request inspection prior to and immediately after placing bedding.
- D. Frequency of Compaction Tests: One per lift per 200 LF of trench or fraction thereof.
- E. If tests indicate Work does not meet specified requirements, remove unacceptable Work, replace, compact, and retest.

3.8 PROTECTION OF FINISHED WORK

- A. Re-fill, re-grade and re-stabilize any area that becomes unsatisfactory due to freeze-thaw, erosion or settling, or vehicular traffic during construction.

3.9 SCHEDULE: See applicable trench sections on Drawings.

- A. Backfill Under Asphalt Pavement, Concrete Flatwork, and Road Shoulders:
 - 1. To pavement subgrade, compacted to 95 percent.
- B. Backfill Under Grass:
 - 1. To specified depth of topsoil below finish grade, compacted to 90 percent. See Section 32 91 19 - Landscape Grading.
- C. Backfill Under Landscaped Areas:
 - 1. To 12 inches below finish grade, compacted to 90 percent.
- D. Backfill to Correct Over-excavation:
 - 1. To subgrade elevation, Type A4 Aggregate compacted to 98 percent. On a case by case basis, as approved by the Engineer, lean concrete to minimum compressive strength of 1000 psi may be allowed.
- E. Asphalt Patch of Existing Pavement:
 - 1. Type SM-9.5AL to full depth of existing asphalt. Compacted tolerance is 1/8th inch in 2 feet and freely draining as prior to disturbance.

END OF SECTION

SECTION 31 23 23 BACKFILLING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Building perimeter and site structure backfilling to subgrade elevations.
- B. Site backfilling.
- C. Fill under slabs-on-grade.
- D. Fill in landscaped beds/areas.
- E. Fill for over-excavation.
- F. Consolidation and compaction as scheduled.

1.2 RELATED SECTIONS

- A. Section 31 09 00 - Geotechnical Engineering, Inspection, and Testing: Geotechnical Engineer.
- B. Section 31 05 13 - Soil Materials.
- C. Section 31 05 16 - Aggregate Materials.
- D. Section 31 23 16 - Excavating.
- E. Section 31 23 17 - Utility Trenching & Backfilling: Backfilling of utility trenches.
- F. Section 33 46 00 - Subdrainage: Filter aggregate and filter fabric.
- G. Section 32 13 13 – Portland Cement Concrete Pavement. Concrete Materials.
- H. Section 32 91 19 - Landscape Grading: Filling of topsoil to finish grade elevation.

1.3 REFERENCES

- A. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
- B. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

- D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.4 SUBMITTALS FOR REVIEW

- A. Samples: Submit to testing laboratory, in air-tight containers, 10 lb sample of each type of subsoil fill from each source to be used.
- B. Samples: Submit to testing laboratory, in air-tight containers, 10 lb sample of each type of aggregate fill from each source to be used.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Fill Type S1: As specified in Section 31 05 13.
- B. Structural Fill Type A4: As specified in Section 31 05 16.
- C. Topsoil Fill Type T1 or T2: As specified in Section 31 05 13.
- D. Concrete: Lean concrete conforming to Section 03 30 00 with a compressive strength of 1,000 psi.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify sub-drainage, damp proofing, or waterproofing installation has been inspected.
- B. Verify structural ability of unsupported walls to support loads imposed by the fill. Allow necessary time for curing and provide adequate bracing prior to backfilling.

3.2 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place in locations and to the extent as required by the Geotechnical Engineer. Backfill in accordance with schedule at the end of this section.
- C. Scarify and proof roll subgrade surface to a depth of 1 inch to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.3 BACKFILLING

- A. Backfill areas to contours and elevations with unfrozen materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- C. Place geotextile fabric over Type A2 fill prior to placing next lift of fill.
- D. Soil Fill Type S1: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
- E. Employ a placement method that does not disturb or damage other work.
- F. Maintain optimum moisture content of backfill materials to attain required compaction density.
- G. Backfill against supported foundation walls and retaining walls. Do not backfill against unsupported walls.
- H. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- I. Maintain minimum grade away from building per Section 31 22 13 – Rough Grading.
- J. Make gradual grade changes. Blend slope into level areas.
- K. Stockpile in sufficient quantities to meet Project schedule and requirements where specified in Section 31 22 13 – Rough Grading. Remove excess material and material unsuitable for reuse as fill from site.

3.4 TOLERANCES

- A. Top Surface of Backfill (Subgrade): Plus or minus 0.1 foot within 100 feet of buildings, under all pavement and site improvements (such as athletic/play fields); and 0.25 foot on surrounding fields and slopes.

3.5 FIELD QUALITY CONTROL

- A. Section 31 09 00 - Geotechnical Engineering, Inspection, and Testing.
- B. Compaction testing will be performed in accordance with ASTM D698.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

- D. Frequency of Tests: Meeting requirements listed in Section 31 22 13 – Rough Grading

	<u>Max. Lift Thickness</u>	<u>Tests (per Lift)</u>
Backfills (Exterior)	8"	1 per 2,500 s.f.
Under Paving, Curbs, Walks, Footings, and Slabs on Grade	8"	1 per 1,000 s.f.

3.6 PROTECTION OF FINISHED WORK

- A. Reshape and re-compact fills subjected to vehicular traffic.

3.7 SCHEDULE

- A. Exterior Under Pavement:

1. Fill Type S1, per section on Drawings, compacted to 95 percent,

- B. Exterior Side of Foundation Walls, Retaining Walls and Over (geotextile protected) Granular Filter Material and Foundation Perimeter Drainage Stone:

1. Fill Type S1, per structural details to subgrade elevation, each lift, compacted to 90 percent.

- C. Fill Under Grass and Landscaped Areas:

1. Fill Type S1, to rough grade, compacted to 90 percent.

- D. Fill to Correct Over-excavation:

1. Lean concrete to minimum compressive strength of 1000 psi, OR
2. Aggregate Type A4, flush to required elevation, compacted to 98 percent.

END OF SECTION

SECTION 31 25 13
EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 WORK INCLUDED (But is not limited to)

- A. Furnish all labor, equipment and materials to complete and maintain Erosion and Sediment Control (ESC) measures necessary to prepare for and control proposed land disturbance per local and state regulations.
- B. Responsible Land Disturber defined.
- C. Install ESC Structures and Measures.
- D. Maintain Effectiveness of Structures and Measures.
- E. Control Water Run-off.
- F. Control Dust Accumulation.
- G. Control Amount of Disturbed/Unstabilized Area.
- H. Temporary and Permanent Stabilization of Disturbed Areas.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 00 & 01: Permits, Fees, & Notices: Land Disturbing Permit.
- B. Section 31 10 00 – Site Preparation & Clearing: Topsoil Stripping and Stockpiling.
- C. Section 31 22 13 – Rough Grading: Site subgrade contouring.
- D. Section 31 23 16 – Excavating and Filling: Excavating for other than linear utility work.
- E. Section 31 23 23 – Backfilling: Backfilling for other than linear utility work.
- F. Section 31 23 17 – Utility Trenching & Backfilling.
- G. Section 33 41 00 – Site Storm Drainage System.
- H. Section 32 91 19 – Landscape Grading: Topsoiling.
- I. Section 32 92 19 – Seeding: Temporary Seeding. Permanent Seeding.

1.3 REFERENCES

- A. Virginia Erosion & Sediment Control (ESC) Handbook: Temporary seeding, construction entrances and other measures or practices which may apply.

- B. Virginia Department of Transportation (VDOT) "Road & Bridge Standards & Specifications": Outlet Protection, Channel Sections, Materials, Installation of Measures, etc. (but excluding references to measurement and payment).

1.4 DEFINITIONS

- A. Local Governing Authority (LGA) - The state agency, plan approving authority, municipal department or other entity which legally has jurisdiction over the referenced work or activity. This usually means the field official who makes or controls onsite inspections of the Work.

1.5 REGULATORY REQUIREMENTS

- A. Contractor shall comply with all requirements of the Virginia Erosion & Sediment Control Law pertaining to this project as presented in the Virginia Erosion & Sediment Control Handbook.
- B. Erosion & Sediment Control (ESC):
1. The Contractor shall employ a Responsible Land Disturber who is certified by the Department of Conservation and Recreation. The name of this person is to be designated in writing by the Contractor to the State ESC plan approving authority (LGA) and the Owner along with copies of their certification prior to any land disturbance. The Responsible Land Disturber for this project shall be in charge of and is responsible for carrying out the land-disturbing activities on this project. The certified Responsible Land Disturber may change at any time during the life of this project, as long as the State ESC plan approving authority is notified in advance and in writing.
 2. Obtain and pay for such land disturbing permits as required by the plan approving authorities, including fees and bonds, per Division 0 & 1.
 3. The Contractor shall not begin land disturbance until all required permits have been obtained and, if required, posted at the site. Payment of fees and acquisition of permits shall be made by the Contractor. Permits may include, but are not limited to, the following:
 - a) Local (or State) Land Disturbance Permit.
 - b) Virginia Stormwater Management Program (VSMP) Permit.
 - c) Erosion and Sediment Control Bond.
 - d) Right-of-Way Excavation Permit and Bond.
 4. The plans have been drawn according to specifications of the Virginia Erosion and Sediment Control Handbook (Latest Edition) and pertinent state regulations. The ESC Narrative shall be considered part of these Contract Documents as required by the State ESC plan approving authority (LGA).

1.6 SUBMITTALS

- A. Samples for Initial Selection: Manufacturer's standard color charts showing range of colors available for River Rock erosion control stone.

PART 2 PRODUCTS

2.1 MATERIALS

- A. All Erosion and Sediment Control materials shall conform to the standards set forth in the ESC Handbook unless indicated as VDOT Std. in which case they shall conform to the "Road & Bridge Stds. & Specs."
- B. Construction Entrance Stone: Provide in accordance with the ESC Handbook Std. & Spec. 3.02.
- C. Outlet Protection or Storm Water Conveyance Channel Stone: Provide in accordance with VDOT Std. EC-1 Erosion Control Stone and Spec. 414.03(e) Erosion Control Stone. Rock shall be washed River Rock, uniform in size, per median stone size indicated on the Drawings. All fines shall be screened from the aggregate. Rock shall be composed of round River Rocks that may be varied in color, sound, durable, non-erodible and free from seams, cracks, and other structural defects.
- D. Outlet Protection Stone Geotextile Fabric for bedding shall conform to VDOT Std. & Spec. Section 245, which includes but is not limited to meeting the following requirements: apparent size opening equal to or greater than No. 50 sieve as tested per ASTM D4751, tensile strength @ 20% maximum elongation of 30 lbs/linear inch minimum as tested per VTM-52, puncture strength of 80 lbs minimum as tested per ASTM D4833, and have seams equal in strength to the basic material. Submit written documentation of test results from an independent commercial lab verifying that material meets specified requirements.
- E. Silt Fence: Woven fabric for use as silt fence around inlets or to protect slopes.
 - 1. Manufacturer - Product:
 - a) Amoco - Propex Silt Stop
 - b) Mirafi, Inc. - Mirafi 100X, Envirofence
 - c) Exxon - GTF 101-S
 - 2. Posts for staking silt fence shall be 1" x 2" wood with a minimum length of 48".
- F. Filter Fabric: Non-woven fabric for use in foundation drain systems, dry wells, lining beneath EC Stone, etc.
 - 1. Manufacturer - Product:
 - a) TC Mirafi – Mirafi 180N
 - b) Amoco Fabrics and Fibers Co. – ProPex 4547
 - c) Reemay, Inc. – Typar 3401
- G. Temporary & Permanent Seeding and Related Items: Provide in accordance with Section 32 92 19 – Seeding.

- H. Water: Water shall be potable and provided in accordance with Section 01 51 00
– Temporary Utilities: Temporary Water.

PART 3 EXECUTION

3.1 GENERAL

- A. Accept premises as found. Owner assumes no responsibility for conditions of the site or continuation of conditions existing at the time of advertisement.
- B. Temporary erosion and sediment control measures are required during construction and shall be installed prior to any clearing, grading or other construction, and to the minimum standards and specifications of the ESC Handbook. Comply with all minimum standards of the Virginia Erosion and Sediment Control Regulations, 4VAC50-30-40 of the Code of Virginia.
- C. Permanent storm water management measures are required for the project and shall be installed to the minimum standards and specifications of the ESC Handbook. Comply with all minimum standards of the Virginia Storm Water Management Regulations, 4VAC3-20 et seq.
- D. The erosion control and storm water management plans as approved by the LGA shall be made part of these Contract Documents. This includes the ESC Narrative.
- E. Prior to initial disturbance of earth, comply with all applicable standards and ordinances to prevent soil erosion and siltation. Install, construct and maintain such measures as shown on Drawings and all others as required by the inspecting authorities having jurisdiction.
- F. Be responsible for satisfying any and all erosion control and storm water management requirements for any land disturbing activities, including but not limited to on-site or off-site borrow, on-site or off-site stockpiling or disposal of waste materials. Before undertaking any land disturbing activity for which the Contract Documents do not specifically address erosion control and storm water management (such as off-site borrow and waste areas), contact the Regional Office of the Division of Soil and Water Conservation (SWC) or other LGA to determine what Erosion Control and storm water management measures are necessary. Completely satisfy all requirements of the LGA, including payment of design, review, and permit expenses, before continuing with the concerned activity.
- G. Dust Control: Any material which will result in dust shall be wet down during the work.
- H. Use whatever means necessary to prevent mud and dirt from being carried onto public streets.
- I. Should mud and dirt accumulate on streets execute immediate cleaning methods to remove accumulation.

3.2 PREPARATION

- A. Assure that all pertinent required permits have been obtained.
- B. Notify LGA of intent to begin work.
- C. Verify that existing trees/plant life designated to remain, are conspicuously marked as such.

3.3 PROTECTION

- A. Protection of adjacent properties and waterways: Prior to any land disturbance activity install Erosion and Sediment Control measures. See Site Drawings for specific practices required to prevent soil from washing from areas disturbed during clearing operations. Maintain all ESC measures required.
- B. Protection of Existing Trees and Vegetation:
 1. Provide protection for existing trees, plant growth, and features designated to remain against compacting the root zone, unnecessary cutting, breaking, skinning of roots, or bruising of bark. Conform to details and specifications of the ESC Handbook for methods of protection.
 2. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in a manner acceptable to the Architect.

3.4 EROSION & SEDIMENT CONTROL MEASURES

- A. General:
 1. The LGA reserves the right to require more ESC measures if field observation of in place measures shows they are inadequate for the task.
 2. Maintain erosion control during construction until permanent pavement, plantings and restoration of natural areas is effective in controlling erosion.
 3. Plan and execute construction by methods to control surface drainage from cut, fill, borrow and grading areas.
 4. Minimize amount of bare soil exposed at one time.
 5. Schedule operations so ground surface will be disturbed for shortest possible time before permanent construction is installed.
 6. Maintain large areas as flat as practicable to minimize soil transfer through surface flow.
 7. Storm Drainage System: Install as much of permanent system as soon as practicable and divert surface water into system, with remainder of system installed as soon as conditions allow. Coordinate with Section 33 41 00 - Site Storm Drainage System.
 8. Repair washed and eroded areas. Re-establish required grades, densities, elevations, profiles and contours. Re-seed as required.
- B. Temporary Construction Entrance:
 1. A construction entrance is required at all locations where construction vehicles enter a public right-of-way. During wet weather conditions, clean the wheels of construction vehicles prior to their accessing public streets.
 2. Install and maintain in accordance with VEC Std. & Spec. 3.02, to the

- extent shown on Drawings.
3. No point of vehicular access onto the disturbed earthen portion of the site shall be utilized other than the Construction Entrance (CE) shown on Drawings. Access is allowed from pavement directly onto Construction Road Stabilization (CRS) but not from CRS onto disturbed earth.
 4. Place stone to the dimensions shown on Drawings (default: 12' width x 70' length, minimum) and at a depth of 6 inches minimum. A wash rack and temporary water service may be required by the LGA at their discretion.
 5. In addition to periodically adding clean stone to the construction entrance and maintaining the edges, the Contractor is required to clean all mud, soil and debris from public roadways which originates from the project site on a daily basis.
- C. Silt Fence:
1. Install and maintain in accordance with VEC Std. & Spec. 3.05 to the extent shown on Drawings.
 2. Drive posts a minimum of 12 inches into the ground at a maximum spacing of 10 feet. Maximum height above grade shall be 36 inches.
 3. At the base of the posts on the up hill side, excavate a continuous shallow trench.
 4. Staple, wire or attach filter fabric to the post according to the manufacturer's instructions, leaving 8 inches of fabric along the bottom.
 5. Extend bottom surplus of fabric into the trench. Backfill and compact the soil over the trench providing a secure anchor.
- D. Storm Drain Inlet Protection for Drop Inlets:
1. Install and maintain in accordance with VEC Std. & Spec. 3.07, using filter fabric as herein specified.
 2. Space posts around the perimeter of the inlet at 3 feet on center and drive 12 inches into the ground. The height above-grade of the posts shall be between 15 and 18 inches.
 3. Excavate a shallow trench around the perimeter of the posts.
 4. Staple, wire or attach fabric to the posts according to the manufacturer's recommendations, leaving 8 inches of surplus fabric along the bottom.
 5. Extend bottom of fabric into the trench, backfill and compact over the trench.
- E. Storm Drain Inlet Protection for Culverts:
1. Install and maintain in accordance with ESC Std. & Spec. 3.08, using material as herein specified.
 2. Space posts around the perimeter of the culvert inlet placed approximately 6 feet up stream from the culvert at a maximum of 3 feet on center and drive 12 inches into the ground. The height above-grade of the posts shall be between 16 and 36 inches.
 3. Excavate a shallow trench around the perimeter of the posts.
 4. Staple, wire or attach fabric to the posts according to the manufacturer's recommendations, leaving 8 inches of surplus fabric along the bottom.
 5. Extend bottom of fabric into the trench, backfill and compact over the trench.
 6. If the above proves of insufficient to provide protection from silt entering the culvert, replace with the Optional Stone Combination as detailed in ESC

Handbook Plate 3.08-1.

- F. Outlet Protection or Storm Water Conveyance Channel:**
1. After surrounding area has been brought to subgrade, excavate to subgrade elevations for OP or SCC as indicated from finish grade on plans less EC Stone depth in detail.
 2. Compact subgrade to requirements for surrounding subgrade under applicable earthwork section.
 3. Install bedding geotextile fabric in accordance with detail, overlapping joints 6 inches minimum and stapling per manufacturer's recommendations and entrenching entire perimeter of fabric 9 inches. Compact fabric entrenchment to requirements of surrounding subgrade.
 4. Place, do not dump, Erosion Control Stone to the dimensions and configuration indicated on the applicable detail.
- G. Erosion Control/Re-vegetation Mat:**
1. Install Erosion Control Mat in accordance with VDOT Std. EC-2 or EC-3 in the locations shown on Drawings or as otherwise indicated.
 2. Install Re-vegetation Mat in the locations shown on Drawings or otherwise indicated. Mat shall conform to Part 2 of Section 32 92 19 - Seeding.
 3. Shape and grade the channel or slope; remove all rock and debris.
 4. Place and compact topsoil to the depth previously specified.
 5. Apply fertilizer, lime and seed at the rates specified for seeded lawn areas in Section 32 92 19 – Seeding.
 6. Place and secure the mat as described in Part 3 of Section 32 92 19 – Seeding.
- H. Sediment Trap:**
1. Install sediment trap in accordance with and at the location shown on the Drawings. This shall be part of the first work accomplished since it is the primary measure to control sediment from leaving the site from further land disturbance.
 2. Upon stabilization of the site, the sediment trap shall be returned to lawn by backfilling area and stabilizing with grass and mulch.
- I. Temporary Seeding:**
1. Temporary seeding shall be applied to denuded areas within seven (7) days after final grade has been established and to portions of the site which may not be at final grade but which will remain inactive for more than 30 days and less than one year. Lawn areas and slopes may be topsoiled and permanently seeded only if this can be accomplished during the correct time of year for the permanent seed mixture specified in Section 32 92 19 – Seeding. Permanent Seeding is required for areas which will remain dormant for more than one year.
 2. Where the area is compacted, crusted or hardened, the soil surface shall be loosened by disking, raking, harrowing or other means.
 3. Apply lime at a rate of 50 pounds per 1000 sq. ft. and 5-10-10 fertilizer at 10 pounds per 1000 sq. ft. Thoroughly mix into loosened soil.
 4. Seed shall be evenly applied at a rate of 2 lbs. per 1000 sq. ft. to the prepared ground and mulched.
 5. Slopes greater than 3:1 shall be hydroseeded. Other areas may be

- hydroseeded or dry seeded at the Contractor's option.
 6. Hydroseeding operations shall include seed, fertilizer, mulch and binder in one operation. Areas which are hydroseeded from 6/1 to 9/1 or 12/1 to 3/1 shall be mulched with straw. Wood fiber mulch shall not be used during these times.
 7. After mulching of dry seeded areas, mulch shall be stabilized using a liquid binder. Portions which continue to lose mulch due to wind or runoff shall be further stabilized with mulch stabilization netting. Install netting according to Section 32 92 19 – Seeding.
 8. Areas which fail to establish initial vegetative cover adequate in checking erosion shall be re-seeded as soon as such areas are recognized. Matting and blankets shall be installed on areas which fail to establish subsequent vegetative efforts.
- J. Topsoil/Soil Materials Stockpile: Do not stockpile in drainage ways or within the drip line of trees. Stockpile to a depth not exceeding 8 feet (2.5 m) and with side slopes not exceeding 2H:1V. Protect from wind and water erosion and from admixture of debris. Temporarily seed all stockpiles and surround with silt fencing.
- K. Tree Protection:
1. Install and maintain in accordance with VEC Std. & Spec. 3.38 to the extent shown on the Drawings, unless detailed otherwise. Also refer to Section 31 10 00 – Site Clearing and Preparation and Section 31 23 23 – Backfilling for filling within drip lines of vegetation to remain.
 2. The limits of clearing shall be beyond the drip line of existing trees to remain.
 3. Prior to clearing the site, protected trees shall be clearly identified with a bright colored surveyor's ribbon applied in a band circling the tree at heights of 4 and 8 feet.
 4. No equipment, building materials or topsoil shall be placed within the drip line of protected trees.
 5. 40 inch high snow fence shall be placed at the limits of clearing (drip line). Fence shall be maintained at all times.

3.5 REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROLS

- A. Remove temporary erosion and sediment control measures within 30 days after permanent lawn areas have become substantially established as defined in Section 32 92 19 - Seeding or after the temporary measures are no longer required as determined and authorized by the local program administrator. Permanently stabilize disturbed soil areas resulting from the disposition of temporary measures to prevent further erosion.

END OF SECTION

**SECTION 31 31 16
TERMITE CONTROL**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Soil treatment with termiticide.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of termite control product.
 - 1. Include the EPA-Registered Label for termiticide products.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For termite control products, from manufacturer.
- B. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's records and include the following:
 - 1. Date and time of application.
 - 2. Moisture content of soil before application.
 - 3. Termiticide brand name and manufacturer.
 - 4. Quantity of undiluted termiticide used.
 - 5. Dilutions, methods, volumes used, and rates of application.
 - 6. Areas of application.
 - 7. Water source for application.
- C. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Formulate and apply termiticides and termiticide devices according to the EPA-Registered Label.
- B. Source Limitations: Obtain termite control products from single manufacturer.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.
- B. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.

1.7 WARRANTY

- A. Soil Treatment Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor, certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

- A. Termiticide: Provide an EPA-Registered termiticide, complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Corporation, Agricultural Products; Termidor.
 - b. Bayer Environmental Science; Premise 75.
 - c. FMC Corporation, Agricultural Products Group; Dragnet FT, Talstar, Prevail.
 - d. Syngenta; Demon TC, Prelude, Probuild TC.
 - 2. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil per termiticide label requirements, interfaces with earthwork, slab and foundation work, landscaping, utility installation, and other conditions affecting performance of termite control.

- B. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparation before beginning application of termite control treatment. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.
 - 1. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.3 APPLICATION, GENERAL

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

3.4 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around building construction. Distribute treatment evenly.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION

SECTION 32 12 16
ASPHALT PAVEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Asphaltic Concrete Paving; surface/wearing course and base/binder course.
- B. Surface sealer, primer/tack coat.
- C. Aggregate Base Course; depth and compaction.

1.2 RELATED SECTIONS

- A. Section 31 09 00 - Geotechnical Engineering, Inspection, and Testing.
- B. Section 31 05 13 - Soil Materials: Testing aggregate materials.
- C. Section 31 05 16 - Aggregate Materials: Aggregate Base Course. Testing aggregate materials.
- D. Section 31 22 13 - Rough Grading: Site subgrade contouring. Preparation of site for paving and base. Compaction testing.
- E. Section 31 23 16 - Excavating: Excavating for other than linear utility work.
- F. Section 31 23 23 - Backfilling: Backfilling for other than linear utility work.
- G. Section 31 23 17 - Utility Trenching & Backfilling.
- H. Section 33 41 00 - Site Storm Drainage Systems.
- I. Section 32 17 23 - Pavement Marking & Signage.
- J. Section 32 91 19 - Landscape Grading: Topsoil depth. Adjacent surface rough grade.

1.3 DEFINITIONS

- A. Local Governing Authority (LGA) - The state agency, municipal department or other entity which legally has jurisdiction over the referenced work or activity. This usually means the field official who makes or controls onsite inspections of the work.

1.4 REFERENCE STANDARDS

- A. Virginia Department of Transportation "Road & Bridge Standards & Specifications", latest edition. VDOT section numbers referenced herein refer to sections in these Road & Bridge Specifications. The provisions therein for method of measurement and payment do not apply.

- B. Manual of Uniform Traffic Control Devices (MUTCD, including Virginia supplement), latest edition.
- C. Americans With Disabilities Act (ADA): 28 CFR Part 36, Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities; Final Rule dated July 26, 1991.
- D. Local Governing Authority Regulations pertaining to work of this section (i.e. handicapped parking marking and signage requirements, fire lane marking and signage requirements, etc.).

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with requirements of Reference Standards above. Refer to ACI 304 for any concrete related item not covered in Reference Standard.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with industry standards, the specified requirements and the methods for proper performance of the work of this section.
- C. Asphalt Mixing Plant: VDOT Certified.
- D. Obtain materials from same source throughout.

1.6 SUBMITTALS FOR INFORMATION

- A. Submit certification from Asphalt batch plant for proposed mix design of each class of mix for information prior to beginning of work.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not produce or place asphalt when the weather is rainy or foggy, when the base course is frozen or has excess moisture, or when the ambient temperature is less than 40 degrees F in the shade away from artificial heat.
- B. Other materials shall be placed or installed per manufacturer's recommendations.

1.8 BARRICADES AND SIGNALS

- A. Within public right-of-way, provide and maintain temporary signs, signals, lighting devices, markings, barricades, and channelizing and hand signaling devices in accordance with DOT D-6.1 to protect personnel and new construction from damage by equipment and vehicles until the surface is approved by the VDOT Inspector, LGA, or Architect/Engineer, as applicable.
- B. On-site, provide and maintain temporary signs, signals, lighting devices, markings, and barricades to protect personnel and new construction from damage by equipment and vehicles until the surface is approved by the Architect/Engineer.

1.9 REGULATORY REQUIREMENTS

- A. VDOT review, approval and inspections per VDOT Stds.

PART 2 PRODUCTS

2.1 AGGREGATE BASE COURSE

- A. Aggregate Base under Asphalt Pavement: Coarse Aggregate Type A4 in accordance with Section 31 05 16 - Aggregate Materials (see Pavement Sections on Drawings).

2.2 ASPHALTIC CONCRETE PAVING

- A. Primer, Tack & Seal Coats: In accordance with VDOT Section 210, Asphalt Materials.
- B. Asphalt Base Course: In accordance with VDOT Section 212.20, Type BM-25.0 bituminous concrete.
- C. Asphalt Surface Course: In accordance with VDOT Section 212.17, Type SM-9.5A bituminous concrete.

2.3 SOURCE QUALITY CONTROL AND TESTS

- A. Section 31 09 00 – Geotechnical Engineering, Inspection, and Testing: Aggregate and asphalt testing. Compaction testing. Geotechnical Engineer.
- B. Have required tests made by Geotechnical Engineer (in lieu of VDOT) per Reference Standard. Submit all VDOT required information to VDOT as applicable. Test asphalt samples for depth and density.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Coordinate the Work and verify base conditions. Verify that all pre-requisite work (subsurface utilities, etc.) has been completed and is ready to receive the work of this section. Verify that compacted subgrade is dry and ready to support paving/surfacing and imposed loads. Verify that gradients and elevations of base are correct.
- B. Ensure that all existing utility structures, new or existing, have been adjusted to meet proposed finished grades prior to paving.

3.2 PLACING AGGREGATE BASE COURSE

- A. For Asphalt Pavement: Begin spreading base material at the point nearest the source of supply. Permit traffic and hauling over the base. Fill ruts formed by traffic and reroll. After base course placement, continue machining and rolling until surface is smooth, compacted, well bonded, and true to the designed cross

section. Compact to 100 percent ASTM D-698 maximum dry density. Maintain the base smooth and true to grade and cross section until asphaltic concrete placement.

3.3 PREPARATION

- A. Protect finished surfaces adjacent to asphalt work from overspray, damage by equipment, etc.
- B. For repair work, cut existing surface back to undisturbed material to provide uniform division lines between existing and new work.
- C. Butt new work to existing surfaces to result in smooth transitions and uniform sections.
- D. Before placing surface, inspect the subgrade and base for conformity with the specified section. If necessary, remove or add material to bring all portions of the subgrade and base to proper section and correct elevation. Thoroughly compact and inspect the adjusted section after correcting.
- E. Asphalt Pavement - Primer:
 1. Apply a prime coat on the finished stone base course at a rate of 0.25 gallon residual asphalt per square yard. Allow prime coat to cure for a minimum of 48 hours prior to placing asphaltic concrete. Apply cutback asphalts when the stone base course is dry. Lightly spray stone base with water immediately prior to application of emulsified asphalts. During prime coat placement, minimum ambient temperature shall be 50 degrees F and rising. Maintain and protect primed surfaces from damage until asphaltic concrete placement.
 2. Apply primer in accordance with VDOT Section 311 - Prime Coat.
 3. Apply primer to contact surfaces of curbs and gutters.
 4. Use clean sand to blot excess primer.
- F. Asphalt Pavement - Tack Coat:
 1. Apply tack coat on existing pavement to be overlaid at a rate of 0.10 gallon residual asphalt per square yard. Thoroughly clean surfaces to receive the tack coat immediately prior to application of tack coat. Tack coat shall be tacky at the time of asphaltic concrete placement.
 2. Apply tack coat in accordance with VDOT Standards.
 3. Apply tack coat to contact surfaces of curbs and gutters.
 4. Coat surfaces of manhole and drainage structure frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.
- G. Asphalt Pavement - Seal Coats:
 1. Apply asphalt and cover material in accordance with VDOT Section 312 - Seal Coat.

3.4 PLACING ASPHALT PAVEMENT - SINGLE COURSE

- A. Install Work in accordance with VDOT standards.
- B. Place to compacted thickness identified in details on Drawings.
- C. Install drainage tops/frames in correct position and elevation.
- D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.5 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

- A. Place base/binder course to compacted thickness identified in details on Drawings.
- B. Place surface/wearing course within two (2) hours of placing and compacting binder course.
- C. Place surface/wearing course to compacted thickness identified in details on Drawings.
- D. Install drainage tops/frames in correct position and elevation.
- E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- F. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.6 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Scheduled Compacted Thickness: Within 1/4 inch.
- C. Variation from True Elevation: Within 1/2 inch.
- D. Assure that drainage swales over pavement function as designed.

3.7 FIELD QUALITY CONTROL

- A. Field testing methods shall be as determined by the Geotechnical Engineer.

3.8 PROTECTION OF ASPHALT

- A. Immediately after placement, protect pavement from premature drying and excessive hot or cold temperatures. Also, protect pavement from mechanical injury for one (1) day or until surface temperature is less than 140 degrees F (60 degrees C).

B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

3.9 SCHEDULES

A. Refer to details on the Drawings.

END OF SECTION

SECTION 32 13 13
PORTLAND CEMENT CONCRETE PAVEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete sidewalks, integral curbs, curb &/or gutters, median barriers, parking areas, and dumpster enclosures.
- B. Aggregate base course.

1.2 RELATED SECTIONS (including but not limited to)

- A. Division 01 – Submittals, Quality Requirements, Inspection and Testing, Traffic Regulation, Protection of Completed Work.
- B. Section 31 09 00 - Geotechnical Engineering, Inspections, and Testing.
- C. Section 31 05 16 - Aggregate Materials: Aggregate base course.
- D. Section 31 22 13 - Rough Grading: Preparation of site for paving and base.
- E. Section 31 23 23 - Backfilling: Compacted subbase for paving.
- F. Section 32 91 19 - Landscape Grading: Preparation of subsoil at pavement perimeter.
- G. Section 03 30 00 - Cast-in-place Concrete: Reinforcing, Joints, Curing.
- H. Section 07 92 00 - Joint Sealers: Sealant for joints.

1.3 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings.
- B. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- C. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
- D. ASTM C33 - Concrete Aggregates.
- E. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- F. ASTM C698 - Test Methods for Moisture-Density Relations of Soil and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
- G. Virginia Department of Transportation "Road & Bridge Standards & Specifications", latest edition. VDOT section numbers referenced herein refer to

sections in these Road & Bridge Specifications. The provisions therein for method of measurement and payment do not apply.

1.4 SUBMITTALS FOR INFORMATION

- A. Section 01 33 00 – Submittal Procedures.
- B. Product Data: Provide data on joint filler, admixtures, curing compounds and ADA tactile warning mats.
- C. Submit certification from Concrete batch plant for proposed mix design of each class of mix for information prior to beginning of work.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with requirements of Reference Standards above. Refer to ACI 304 for any concrete related item not covered in Reference Standard. Maintain one copy of the reference utilized onsite with Contract Documents.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with industry standards, the specified requirements and the methods for proper performance of the work of this section.
- C. Concrete Mixing Plant: VDOT Certified.
- D. Obtain materials from same source throughout.

1.6 REGULATORY REQUIREMENTS

- A. Conform to VDOT review, approval and inspections per VDOT Stds.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Materials, other than concrete, shall be placed or installed per manufacturer's recommendations.

PART 2 PRODUCTS

2.1 AGGREGATE BASE

- A. Aggregate for Base Course: Type A3 per Section 31 05 16 - Aggregate Materials.

2.2 FORM MATERIALS

- A. Steel form material, profiled to suit conditions.
- B. Joint Filler: Asphalt impregnated fiberboard, 1/2 inch thick by full depth of concrete pavement less 1/2 inch allowance for joint sealant.

- C. Curbing Joint Filler: Asphalt impregnated fiberboard, 1/2 inch thick by full depth of VDOT Std. CG-2 (curb only) or CG-6 (curb & gutter) as indicated less 1/2 inch allowance for joint sealant. See Drawings for delineation.

2.3 REINFORCEMENT

- A. Reinforcing Steel and Welded Steel Wire Fabric: Type specified in Section 03 30 00 - Cast-in-Place Concrete.
- B. Dowels: ASTM A615; 40 ksi (276 MPa) yield grade, plain steel, galvanized finish.

2.4 CONCRETE MATERIALS

- A. Concrete shall be VDOT Std. Class A3.5 for walks and stairs and Class A4 within traffic bearing areas. See Drawings for delineations.
- B. Fine and Coarse Mix Aggregates: ASTM C33.
- C. Detectable Warning Surface: Per VDOT Std. CG-12.
- D. Water: Potable, not detrimental to concrete.

2.5 ACCESSORIES

- A. Method of Curing: Membrane Curing Compound meeting requirements of Section 03 30 00 - Cast In Place Concrete.
- B. Joint Sealers: Specified in Section 07 92 00.
- C. Safety Nosing and Handrails: In accordance with Section 05 50 00 - Misc. Metals.
- D. ADA Tactile Warning:
 1. Pre-Cast Concrete Pavers: ADA Compliant, Pre-Cast Detectable Warning Surface Pavers
 - a. Color: As selected by Architect from Manufacturer's standard color options.
 - b. Thin cast stone tactile panels cast into sidewalk. Panels placed under compression with stainless steel prestressing tendons. Truncated dome warning surface complying with ADAAG 4.29. Truncated dome pattern at 2.35 in on center. 5 year minimum manufacturer's warranty.
 - c. Purchase the number and size of panels required to create a continuous 2' wide tactile warning strip for the full width of the walkway, as indicated on the plans. Panel sizes should be the largest size available that will fit within the walkway width without requiring cutting or modification of panels.
 - d. Install using the "wet-set" method in freshly placed concrete and in strict accordance with manufacturer's installation instructions.

- e. Erect units without damage to shape or finish, install in locations indicated on the plans. Install flush with surrounding concrete and fully supported by substrate. A variance in grade of any more than $\frac{1}{4}$ " will not be accepted. Apply slight vibration to fully set panels in fresh concrete.
 - f. Hand tool control joints at edges of panels and in locations shown on drawings. Control joints shall not exceed 6' in spacing.
2. Cast Iron Plates: ADA Compliant, Gray Cast Iron Detectable Warning Surface Plates
- a. Acceptable Manufacturers/Model:
 - 1) Neenah Foundry, Detectable Warning Plate 800-588-5075
 - 2) East Jordan Iron Works, DURALAST 800-626-4653
 - 3) Syracuse Castings, Detectable Warning Plate 315-699-2601
 - 4) Approved Equal.
 - b. Color: Natural Finish
 - c. Slip resistant textured iron surface, minimum 0.8 coefficient of friction.
 - d. Purchase the number and size of panels required to create a continuous 2' wide tactile warning strip for the full width of the walkway, as indicated on the plans. Panel sizes should be the largest size available that will fit within the walkway width without requiring cutting or modification of panels. Provide pre-tapered plates to match curves as necessary.
 - e. Install using the "wet-set" method in freshly placed concrete and in strict accordance with manufacturer's installation instructions.
 - f. Erect units without damage to shape or finish, install in locations indicated on the plans. Install flush with surrounding concrete and fully supported by substrate. A variance in grade of any more than $\frac{1}{4}$ " will not be accepted. Apply slight vibration to fully set panels in fresh concrete.
 - g. Hand tool control joints at edges of panels and in locations shown on drawings. Control joints shall not exceed 6' in spacing.

2.6 FINISH

- A. Finish for exterior flatwork shall be per schedule at the end of this Section.
- B. Edges of exterior flatwork shall be quarter round tooled after broom finish and left with steel troweled appearance and slightest depression below the interior surface.
- C. Crack control joints for exterior flatwork shall be quarter round tooled after broom finish and left with steel troweled appearance and slightest depression below the interior surface.

2.7 SOURCE QUALITY CONTROL AND TESTS

- A. Section 01 40 00 - Quality Requirements: Quality assurance testing.

- B. Section 31 09 00 - Geotechnical Engineering, Inspections, and Testing.
- C. Submit proposed mix design of each class of concrete to appointed firm for review prior to commencement of work.
- D. Tests on cement and aggregates will be performed to ensure conformance with specified requirements.
- E. Test samples in accordance with ACI 301.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Coordinate the Work and verify base conditions under provisions of Div. 1. Verify that all pre-requisite work (subsurface utilities, etc.) has been completed and is ready to receive the work of this section. Verify that compacted subgrade is dry and ready to support paving/surfacing and imposed loads. Verify that gradients and elevations of base are correct.

3.2 PLACING AGGREGATE BASE COURSE

- A. For Concrete Pavement: Place base material of sufficient width to support formed work. Compact to 100 percent ASTM D-698 maximum dry density. Maintain the base smooth, compacted, well bonded, and true to the designed cross section until concrete placement.

3.3 PREPARATION

- A. For repair work, cut existing surface back to undisturbed material to provide uniform division lines between existing and new work.
- B. Butt new work to existing surfaces to result in smooth transitions and uniform sections.
- C. Before placing surface, inspect the subgrade and base for conformity with the specified section. If necessary, remove or add material to bring all portions of the subgrade and base to proper section and correct elevation. Thoroughly compact and inspect the adjusted section after correcting.
- D. Moisten base to minimize absorption of water from fresh concrete.
- E. Coat surfaces of manhole and drainage structure frames with oil to prevent bond with concrete pavement.
- F. Notify Architect/Engineer minimum 24 hours prior to commencement of concreting operations.

3.4 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.5 REINFORCEMENT

- A. Place reinforcement as indicated in details on Drawings.
- B. Interrupt reinforcement at expansion joints.
- C. Place dowels to achieve pavement and curb alignment as necessary to prevent differential settlement of adjacent work. One end of dowel shall be set in capped sleeve to allow longitudinal movement (typical of all installations).
- D. Provide dowels at expansion joints. Place dowels at 12 feet (3.66 m) OC maximum with two (2) per connection min.
- E. Provide keyed and doweled, longitudinal construction joints at maximum of 12 feet (3.66 m) OC where slabs exceed 500 SF and are not otherwise segmented by expansion joints.

3.6 PLACING CONCRETE

- A. Measure, mix, transport, and place concrete in accordance with ACI 304 unless superceded by VDOT Section 217.10 and 316.04(j). Use of admixtures shall be approved in advance by the Architect.
- B. Do not produce or place concrete when the weather is rainy or foggy, when the subgrade is frozen or has excess moisture, or when the ambient temperature is less than 40 degrees F in the shade away from artificial heat.
- C. Place concrete using the slip form technique.
- D. Ensure reinforcement, inserts, embedded parts, formed joints, etc. are not disturbed during concrete placement.
- E. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- F. Place concrete to pattern indicated. Default to VDOT Spec. if none indicated.

3.7 JOINTS

- A. Place joint filler in pavement pattern placement sequence as indicated on the Drawings. Place joint filler between paving components and building or other appurtenances. Place joint filler where new concrete work meets existing concrete.
- B. For linear work place expansion joints at 30 foot (9 m) intervals unless otherwise indicated. Align curb, gutter, and sidewalk joints where adjacent.
- C. Set top to required elevations. Secure to resist movement by wet concrete.
- D. Recess top of filler $\frac{1}{2}$ inch (13 mm) for joint sealant placement.
- E. Use joint sealant for caulking all joints in concrete pavements and walks.
- F. Provide tooled control joints per VDOT specs to pattern indicated (with 6' OC as default value). Verify pattern with Architect prior to concrete placement.
- G. Provide keyed joints as indicated.

3.8 EXPOSED AGGREGATE

- A. Wash exposed aggregate surface with clean water and scrub with stiff bristle brush exposing aggregate to match sample panel.

3.9 FINISHING & CURING

- A. Finish per schedule at the end of this section. Avoid over-finishing!
- B. Direction of Texturing: Transverse to pavement direction, unless otherwise indicated in schedule.
- C. Tactile Warning: Provide ADA required finish where indicated on Drawings. Finished product shall match sample panel.
- D. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with Manufacturer's instructions.

3.10 JOINT SEALING

- A. Separate pavement from vertical surfaces with $\frac{1}{2}$ inch (13 mm) thick joint filler.
- B. Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- C. Extend joint filler from bottom of pavement to within $\frac{1}{2}$ inch (13 mm) of finished surface. Conform to Section 07 92 00 for finish joint sealer requirements.

3.11 CURBS

- A. Install VDOT Std. CG-2 (curb only) and/or VDOT Std. CG-6 (curb & gutter) as delineated on the Drawings. Typically upslope curbing may be curb only. Provide also for dry-pan or reverse gutters at locations required to prevent ponded water. This shall be verified and coordinated in advance with the Architect.
- B. Wiped down or submerged curbs (see details) shall have machined finish matching typical CG-2 finish.

3.12 CONCRETE STAIRS

- A. Place stairs at locations indicated on the Drawings.
- B. Construct per details on the Drawings.

3.13 TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Quality Assurance. Tolerances.
- B. Maximum Variation of Surface Flatness: $\frac{1}{4}$ inch (6 mm) in 10 ft. (3 m).
- C. Maximum Variation From True Position: $\frac{1}{4}$ inch (6 mm).

3.14 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Field inspection and testing.
- B. Section 31 09 00 – Geotechnical Engineering, Inspections, and Testing.
- C. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- D. Three concrete test cylinders will be taken for every 75 or less cu. yds. (57 or less cu m) of each class of concrete placed each day.
- E. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.
- F. One slump test will be taken for each set of test cylinders taken.
- G. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.15 PROTECTION

- A. Section 01 70 00 – Execution Requirements: Protection of Completed Work.
- B. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

- C. Do not permit pedestrian or vehicular traffic over pavement for 7 days minimum after finishing.

3.16 SCHEDULE

- A. Area Paving: As detailed on Drawings with Light broom finish as default. Verify with Architect prior to placement of concrete.
- B. Sidewalk Paving: Light broom, radius to $\frac{1}{4}$ inch radius, and trowel joint edges.
- C. Curbs and Gutters: Light broom.
- D. Inclined Vehicular Ramps: Broomed perpendicular to slope.

END OF SECTION

**SECTION 32 14 00
UNIT PAVING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Engraved brick pavers in aggregate setting bed.
- B. Timber pavers in aggregate setting bed.
- C. Edge restraints for unit pavers.

1.2 SUBMITTALS

- A. Project Data: For each product indicated
- B. Samples: Showing the full range of colors, textures, and patterns available for each type of unit paver indicated.
 - 1. Include Samples of material for joints and accessories involving color selection.

1.3 QUALITY ASSURANCE

- A. Build mockups for each form and pattern of unit paver.
 - 1. Approved mockups may become part of the completed Work.

1.4 PROJECT CONDITIONS

- A. Cold-Weather Protection: Do not use frozen materials or build on frozen subgrade or setting beds.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph title below introduce lists, the following requirements apply for product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work included, but are not limited to, the manufacturers specified.

2.2 COLORS AND TEXTURES

- A. Engraved Brick Pavers to match existing building brick. Color to be approved by Landscape Architect.
- B. Timber Pavers: Shou-Sugi-Ban finish. Sample finish to be approved by Landscape Architect.

1. Shou-Sugi-Ban finish to be applied by contractor to all faces of the timbers using the following method:
 - a) Lay timbers out in single layer in flame-resistant area. Using propane torch, blacken/charr the surface of timbers to a depth of 5 mm.
 - b) Spray timber with water and brush with a stiff bristle scrub brush (not wire brush) to remove excess soot. Allow timber to cool.
 - c) Clean timber and polish with wet rag. Allow to dry before installing.
 - d) This process may be done several times to attain an approved finish.

2.3 UNIT PAVERS

- A. Brick Pavers: Light-traffic paving brick; ASTM C 902 SX, Type II, Application PS. Provide brick without frogs or cores in surfaces exposed to view in the complete Work.
 1. Manufacturers:
 - a) Brick Markers USA, Inc., 6985 Garden Road, West Palm Beach, FL 33404, tel: 800-634-8948, web: www.brickmarkers.com
 - b) Engraved Brick Pavers, 344 E. North Street, Lima, Ohio 45801, tel: 419-408-4129, web: engravedbrickpavers.com
 - c) Gift Bricks, 2920 – 99 Street, Sturtevant, WI 53177, tel: 800-537-

2.4 ACCESSORIES

- A. Aluminum Edge Restraints: Extruded-aluminum edging, 3/16 inch thick by 4 inches high, with loops pressed from face to receive stakes at 12 inches o.c., and aluminum stakes 12 inches long for each loop.
 1. Manufacturers:
 - a) BrickStop Corporation
 - b) Permaloc Corporation
 - c) Sure-loc Aluminum Edging

2.5 AGGREGATE SETTING-BED MATERIALS

- A. Graded Aggregate for Base: Sound crushed stone or gravel complying with ASTM D 448 for Size No. 57.
- B. Geotextile: Woven or nonwoven polyester or polypropylene geotextile, with a permeability rating 10 times greater than that of subgrade soil and an apparent

- opening size small enough to prevent passage of fines from leveling course into base course.
- C. Sand for Leveling Course: Sharp, triangulated, manufactured, washed sand complying with gradation requirements of ASTM C 33 for fine aggregate.
 - D. Sand for Joints: Sharp, washed sand with 100 percent passing No. 16 (1.18-mm) sieve.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.
- B. Cut unit pavers with motor-driven masonry saw to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible.
- C. Joint Pattern: As indicated.
- D. Tolerances: Do not exceed 1/16-inch (1.6-mm) unit-to-unit offset from flush nor 1/8 inch in 24 inches (3 mm in 600 mm) and 1/4 inch in 10 feet (6 mm in 3 m) from level, or indicated slope.
- E. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.

3.2 AGGREGATE SETTING-BED PAVER APPLICATIONS

- A. Compact soil subgrade uniformly to at least 95 percent of ASTM D 1557 laboratory density.
- B. Proof-roll prepared subgrade and correct deficient areas.
- C. Place aggregate base in thickness indicated. Compact by tamping with plate vibrator.
- D. Place geotextile over base course, overlapping ends and edges at least 12 inches (300 mm).
- E. Place leveling course and screed to a thickness of 1/2 inches (25 to 38 mm), taking care that moisture content remains constant and density is loose and constant until pavers are set and compacted.
- F. Treat leveling base with soil sterilizer to inhibit growth of grass and weeds.
- G. Set pavers with hand-tight joints, being careful not to disturb leveling base.
- H. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf (16- to 22-kN) compaction force at 80 to 90 Hz.

- I. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.

END OF SECTION

SECTION 32 17 13
PARKING BUMPERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Precast concrete parking bumpers and anchorage.

1.2 REFERENCES

- A. American Society for Testing and Materials:
1. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 2. ASTM C33 - Concrete Aggregates.
 3. ASTM C150 - Portland Cement.
 4. ASTM C260 - Air-Entraining Admixtures for Concrete.
 5. ASTM C330 - Lightweight Aggregates for Structural Concrete.

1.3 SUBMITTALS

- A. Product Data: Submit unit configuration, dimensions.
- B. Certification from Parking Bumper manufacturer that the delivered product meets or exceeds these specifications.

1.4 COORDINATION

- A. Coordinate the Work with pavement placement and parking striping.

PART 2 PRODUCTS

2.1 CONCRETE BUMPERS

- A. Cement: ANSI/ASTM C150, Portland Type I - Normal; gray color.
- B. Concrete Materials: ASTM C33; water and sand.
- C. Reinforcing Steel: ASTM A615, deformed steel bars; galvanized finish, strength and size commensurate with precast unit design.
- D. Air Entrainment Admixture: ASTM C260.
- E. Concrete Mix: Minimum 5000 psi (34 MPa), 28 day strength, air entrained to 5 to 7 percent.
- F. Use rigid molds, constructed to maintain precast units uniform in shape, size and finish. Maintain consistent quality during manufacture.

- G. Embed reinforcing steel, and drill or sleeve for two dowels.
- H. Cure units to develop concrete quality, and to minimize appearance blemishes including non-uniformity, staining, or surface cracking.
- I. Minor patching in plant is acceptable, providing appearance of units is not impaired.

2.2 CONFIGURATION

- A. Profile: Per detail on Drawings, with drainage slots.

2.3 ACCESSORIES

- A. Dowels: Steel, galvanized finish; 1/2 inch diameter, 18 inch long, pointed tip.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install units without damage to shape or finish. Replace or repair damaged units.
- B. Install units in alignment with adjacent work.
- C. Fasten units in place with 2 dowels for each unit bumper.

3.2 SCHEDULES

- A. Locations as indicated on Drawings.

END OF SECTION

SECTION 32 17 23
PAVEMENT MARKING AND SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pavement Marking & Related Signage.

1.2 RELATED SECTIONS

- A. Section 01 33 00 - Submittal Procedures.
- B. Section 01 60 00 - Product Requirements: Product delivery and Product Storage and Handling.
- C. Section 01 70 00 - Execution Requirements: Spare Parts and Maintenance Products. Final Cleaning.
- D. Section 10 14 00 - Ornamental Signage: Individually mounted dimensional letters and numbers.

1.3 DEFINITIONS

- A. Local Governing Authority (LGA) - The state agency, municipal department, or other entity, which legally has jurisdiction over the referenced work or activity. This usually means the field official who makes or controls onsite inspections of the work.

1.4 REFERENCE STANDARD

- A. Virginia Department of Transportation "Road & Bridge Standards & Specifications", latest edition. VDOT section numbers referenced herein refer to sections in these Road & Bridge Specifications. The provisions therein for method of measurement and payment do not apply.
- B. Manual of Uniform Traffic Control Devices (MUTCD, including Virginia supplement), latest edition.
- C. Americans With Disabilities Act (ADA): 28 CFR Part 36, Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities; Final Rule dated July 26, 1991.
- D. Local Governing Authority Regulations pertaining to work of this section (i.e. handicapped parking marking and signage requirements, fire lane marking and signage requirements, etc.).

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with requirements of Reference Standards above.

Refer to ACI 304 for any concrete related item not covered in Reference Standard. Maintain one copy of the reference utilized onsite with Contract Documents.

- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with industry standards, the specified requirements and the methods for proper performance of the work of this section.
- C. Obtain materials from same source throughout.

1.6 SUBMITTALS FOR INFORMATION

- A. Section 01 33 00 – Submittal Procedures.
- B. Product Data: Provide data on paint materials.
- C. Submit certification from sign supplier for all signage provided that they meet applicable standards above.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01 60 00 – Product Requirements: Product delivery and Product storage and handling.
- B. Deliver products to site in Manufacturer's sealed and labeled containers; inspect to verify acceptability.
- C. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- D. Paint Materials: Store all paint materials in a single location at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by Manufacturer's instructions. Protect from danger of combustion.

1.8 REGULATORY REQUIREMENTS

- A. VDOT review, approval and inspections per VDOT Stds.

1.9 QUALIFICATIONS

- A. Applicator: Company specializing in performing work of this section with minimum three years documented experience.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

1.11 WARRANTY

- A. Section 01 70 00 - Execution Requirements: Requirements for warranties.
- B. Furnish one-year manufacturer's warranty for traffic paints.

1.12 EXTRA MATERIALS

- A. Section 01 70 00 – Execution Requirements: Spare Parts and Maintenance Products.
- B. Supply Owner with 1-gallon of each color, type, and surface texture of paint material used in the work; store where directed.
- C. Label each container with color, type, texture, and locations where used, in addition to the manufacturer's label.

PART 2 PRODUCTS

2.1 EXISTING SIGNAGE

- A. Existing traffic signage may be reused if not damaged and meeting current specifications.
- B. Existing specialty signage shall be salvaged and relocated to new positions as directed by the Owner.

2.2 PAVEMENT MARKING AND SIGNAGE

- A. Provide all identification, fire lane, traffic control and ADA signage indicated on Drawings and per schedule this section. Signs shall meet minimum standards of local fire department/marshal, ADA and Manual of Uniform Traffic Control Devices (MUTCD, including Virginia supplement) for all components. Sign posts shall meet VDOT Stds. & Specs.
- B. Plans have been reviewed and approved by the VDOT and the local governing authority (LGA). If, upon construction compliance inspection by VDOT and LGA building inspector, any signage is lacking per requirements of VDOT, ADA or local code, the Contractor shall provide and place such signs as necessary for compliance at no additional cost to the Owner.
- C. For work within public right-of-way, provide pavement marking in accordance with VDOT requirements.
- D. Provide pavement markings in accordance with VDOT Section 704. For travel lane marking on-site use same with omission of glass beads. For parking lot striping use "Ultra Hide" water reducible acrylic latex traffic paint as manufactured by Glidden, Benjamin Moore, Devoe, PPG or Sherwin-Williams or approved equal.

- Use white for pavement markings, and direction arrows on asphalt (OSHA yellow on concrete) unless otherwise required by reference standards.
- E. Provide temporary markings within the VDOT right-of-way in accordance with VDOT requirements.
 - F. Reference ADA requirements and local regulations for handicapped space marking configuration and colors.
 - G. Recommended Pavement Marking Manufacturer: Pavement Stencil Company, Roanoke, VA or equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Coordinate the Work and verify pavement conditions. Verify that all pre-requisite work (subsurface utilities, etc.) has been completed and is ready to receive the work of this section. Verify that pavement is ready to support paving/surfacing and imposed loads. Verify that finish grade of lawn areas are correct.
- B. Verify that surfaces or substrate conditions, as applicable, are ready to receive Work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Do not apply paint to concrete surfaces until concrete has cured for 28 days
- E. Verify locations, requirements, and extent of work.

3.2 PREPARATION

- A. Surface Appurtenances: Remove or mask any adjacent or attached items which are not to receive applied material prior to preparing surfaces or finishing.
- B. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

3.3 APPLICATION

- A. Protection: Protect work of other trades, whether being painted or not, against damage by painting. Provide "Wet Paint" signs to protect newly painted surfaces.
- B. Procedure: Apply products in accordance with manufacturer's instructions.
- C. Dry Receiving Surface: Do not apply finishes to surfaces that are not dry. Allow applied coats to dry thoroughly before next coat is applied.

- D. Minimum Coating Thickness: Apply no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- E. Appearance: Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- I. Prime concealed surfaces of woodwork with primer paint.
- J. Acceptance: Owner's representative shall determine quality and consistency of coverage, color and finishes. Remove, refinish or repaint work not complying with requirements.

3.4 PAVEMENT MARKINGS

- A. Unless indicated otherwise, provide lane and edge lines four inches (4") in width. Apply paint after asphaltic concrete has cured for a minimum of seven (7) days, and minimum ambient temperature is 40 degrees F. Apply lane and edge markings per manufacturer's recommendation. Apply paint and markings to clean, dry surfaces, protect adjacent surfaces from damage and protect surfaces from traffic until dry. Provide uniform paint film of sufficient thickness to completely conceal base material.
- B. On-site travel lanes and, excluding within parking lots, shall be marked in accordance with VDOT Spec. Section 704 - Pavement Markings & Markers. Requirements for markers and glass beads will not be required on-site. On-site shall mean not within public right-of-way. Note that the public right-of-way includes the bus loop and access thereto. See Schedule this section.
- C. Roadway improvements within public right-of-way shall be marked in accordance with VDOT Spec. Section 704 - Pavement Markings & Markers. Replace any markings damaged by construction. Pavement markings within public right-of-way shall be Type B.
- D. Place required pavement marking and signage in accordance with ADA or Manual of Uniform Traffic Control Devices (MUTCD including Virginia Supplement), as applicable. See Schedule this section. Provide 36 inch deep by 12" square VDOT Std. Class A3 concrete base for signs. See pavement marking and Exterior Handicap Sign detail on the Drawings.
- E. Travel lane stop bars shall be painted, white lines, twenty-four (24) inches in width and across the entire indicated lane width.

- F. Angled bus parking stop bars shall be painted, white lines, twelve (12) inches in width and twenty-four (24) inches in length where indicated on the plan (dimensioned to trailing edge/front of parked bus).
- G. Cross-walks, painted traffic islands, and no parking areas (as shown on plan) shall consist of a six (6) inch wide painted yellow line border, entirely on the asphalt (not spilling over onto concrete gutter, etc.), of the width indicated on the plans, with four (4) inch wide yellow lines painted eighteen (18) inches apart and at forty-five (45) degrees to the border throughout the enclosed area. Verify orientation with Architect prior to painting.

3.5 FIELD QUALITY CONTROL

- A. The Owner reserves the right to engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the project may be taken, identified, sealed and certified in the presence of the contractor. The testing agency will perform appropriate tests as required by the Owner. If tests show material being used does not comply with specified requirements, the contractor shall remove non-complying paint from the site, pay for the testing, and repaint surfaces previously coated with the rejected paint. If necessary, the contractor may be required to remove rejected paint from those surfaces if, on repainting with specified paint, the two coatings are incompatible
- C. Inspect for incorrect location, insufficient thickness, line width, coverage, retention, uncured or discolored material, and insufficient bonding.
- D. Repair lines and markings, which after application and curing do not meet following criteria:
 1. Incorrect Location: Remove and replace incorrectly placed patterns.
 2. Insufficient Thickness, Line Width, Paint Coverage, Glass Bead Coverage or Retention: Prepare defective material by acceptably grinding or blast cleaning to remove substantial amount of beads and to roughen marking surface. Remove loose particles and debris. Apply new markings on cleaned surface in accordance with this Section.
 3. Uncured or Discolored Material, Insufficient Bonding: Remove defective markings in accordance with this Section and clean pavement surface one foot (300 mm) beyond affected area. Apply new markings on cleaned surface in accordance with this Section.
- E. Replace defective pavement markings as specified throughout warranted period. Replace markings damaged by anti-skid materials, studded tires, tire chains, chemical deicers, snow plowing or other loss of marking material regardless of cause. When markings are damaged by pavement failure or by Owner's painting, crack sealing, or pavement repair operations, Contractor is released from warranty requirements for damaged work.
- F. Prepare list of defective areas and areas requiring additional inspection and evaluation to decide where material may need to be replaced.

- G. Replace failed or defective markings in entire section of defective markings within 30 days after notification when any of the following exists during warranty period:
1. Marking exhibits obvious discoloration or pigment loss.
 2. More than 15 percent of area of continuous line within any line segment is missing.

3.6 CLEANING

- A. At the end of each workday, collect empty cans, rags, rubbish, and other discarded paint materials, place in closed metal containers, and remove daily from the site.
- B. After completing painting, clean all paint-splattered surfaces being careful not to cause harm to adjacent finished surfaces. Correct damage caused by painting to the satisfaction of the Owner's representative.
- C. At the completion of construction activities of all other trades, touch up and restore damaged or defaced painted surfaces.

3.7 SCHEDULES

- A. Pavement Marking:
 1. Stop Bar where indicated on Drawings measuring 24" deep by full width of asphalt in lane.
 2. "DO NOT ENTER" as noted on the Drawings.
 3. "STOP" at each stop bar where indicated (each lane as applicable).
 4. Traffic directional arrows where indicated on Drawings.
 5. LGA's Standard handicapped parking space and isle pavement marking in each handicapped space indicated by symbol on Drawings.
 6. Fire lane designation to LGA's Standards as indicated on the Drawings and as required by Fire Marshall.
 7. Pedestrian Crosswalk to MUTCD standards at location indicated on Drawings.
 8. Wheelstops/parking bumpers (Section 32 17 13 - Parking Bumpers)
- B. Signage (locations as noted on the Drawings):
 1. "STOP" at each Stop Bar.
 2. "ONE WAY" with appropriate directional arrow
 3. "NO PARKING – FIRE LANE",
 4. "DO NOT ENTER",
 5. Right Turn Sign,
 6. LGA's Standard handicapped parking space signage at the head of each space and handicapped access signs,
 7. Fire lane designation to LGA's Standards as required by Fire Marshall,

END OF SECTION

SECTION 32 31 19
DECORATIVE METAL FENCING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Aluminum decorative fencing
2. Aluminum gate
3. Privacy screen

1.2 Submittals:

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show locations, components, materials, dimensions, sizes, weights, finishes of components, installation and operational clearances, gate swings, footings and details of post anchorage and attachment and bracing.
- C. Samples: For powder coating on framing, panels and accessories.
- D. Maintenance Data: For finishes.

PART 2 PRODUCTS

2.1 ALUMINUM DECORATIVE FENCING

- A. Flat top aluminum fence, 3-channel/rail with vertical pickets spaced no greater than 4" apart. Commercial-grade fence and posts. Ring adornments between top 2 channels. Height as specified on construction drawings. Finish: Powder-coated, black.
- B. Manufacturers:
 1. Alumi-Guard – 877-258-6448
 2. Ameristar Fence Products – 888-333-3422
 3. Jerith Manufacturing Company, Inc. – 800-344-2242

2.2 ALUMINUM GATE

- A. Flat top double aluminum gate, to match decorative fencing, 3-channel/rail with vertical pickets spaced no greater than 4" apart. Commercial-grade fence and posts. Ring adornments between top 2 channels. Height as specified on construction drawings. Finish: Powder-coated, black.
- B. Manufacturers:
 1. Alumi-Guard – 877-258-6448
 2. Ameristar Fence Products – 888-333-3422
 3. Jerith Manufacturing Company, Inc. – 800-344-2242

2.3 PRIVACY SCREEN

- A. Privacy fence panels for ornamental aluminum fences, installed per manufacturer's specification to fencing and gate surrounding dumpster enclosure. Panels to extend from bottom channel/rail to next channel/rail up (below ring adornment). Color: black. Sample to be approved by Landscape Architect.
- B. Manufacturers:
 - 1. Hoover Fence Co. – 800-355-2335
 - 2. PDS Fence Products – www.pdsfence.com
 - 3. Pexco – 800-755-7528

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Install fencing per manufacturer's specification and construction documents. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
- C. Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil.

END OF SECTION

SECTION 32 32 19
STONE MASONRY ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes stone masonry assemblies consisting of the following:
 - 1. Stone Block

1.2 SUBMITTALS

- A. Product Data: For each type of stone, accessory, and other manufactured product indicated.
- B. Samples: Showing range of colors and textures available for stone masonry.
- C. Material Test Reports: For each type of mortar, and grout required.
- D. Material Certificates: For each type of masonry stone required.

1.3 QUALITY ASSURANCE

- A. Mockups: Build sample area for each type of exposed stone masonry assembly to verify selections made under sample Submittals and to demonstrate aesthetic effects.
 - 1. Build mockups in size relative to indications on drawings. If approved mockup may become part of finished work.

1.4 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements in ACI 530.1/ASCE 6/TMS 602.
- B. Hot-Weather Requirements: When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set stone within one minute of spreading mortar.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 COLORS AND TEXTURES

- A. Stone Masonry: Color to match range of Landscape Architect's approved example.

2.3 MASONRY STONES

- A. Stone Masonry:

1. Locally salvaged wall stone to match Landscape Architect's approved example.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.

- B. Hydrated Lime: ASTM C 207, Type S.

- C. Mortar Cement: ASTM C 1329.

1. Available Products:

- a. Blue Circle Cement; Magnolia Superbond Mortar Cement.
 - b. Lafarge Corporation; Lafarge Mortar Cement.

- D. Masonry Cement: ASTM C 91.

- E. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.

- F. Aggregate for Grout: ASTM C 404.

- G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.

1. Available Products:

- a. Euclid Chemical Co.; Accelguard 80.
 - b. Grace, W. R. & Co., Construction Products Division; Morseled.
 - c. Sonneborn, Div. of ChemRex, Inc.; Trimix-NCA.

- H. Water: Potable.

2.6 TIES AND ANCHORS

A. Materials, General: As follows, unless otherwise indicated:

1. Galvanized Corrugated Steel Strip: ASTM A 366/A 366M cold-rolled, carbon-steel strip hot-dip galvanized after fabrication to comply with ASTM A 153, at exterior walls. Minimum 7/8 inch wide, 22-gauge.

2.5 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2-cup (0.14-L) dry measure tetrasodium polyphosphate and 1/2-cup (0.14-L) dry measure laundry detergent dissolved in 1 gal. (4 L) of water.

2.6 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, unless otherwise indicated. Do not use calcium chloride in mortar or grout.

B. Mortar for Stone Masonry: Comply with ASTM C 270, Proportion Specification.

C. Mortar for Stone Masonry: Comply with ASTM C 270, Property Specification.

1. Extended-Life Mortar for Stone Masonry: Mortar complying with ASTM C 1142 may be used instead of mortar specified above, at Contractor's option.
2. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
3. For masonry below grade, in contact with earth, and where indicated, use Type M or M or RM.
4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N or RN.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Select and arrange stone as indicated in drawings.

B. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.
2. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

3.2 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size stones, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Lay exposed masonry in bond pattern indicated; do not use stones with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- D. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

3.3 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 1. With full mortar coverage on horizontal and vertical face shells.
 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
- B. Tool exposed joints to yield a beaded mortar joint, slightly convex when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

3.4 CAVITIES

- A. Keep cavities clean of mortar droppings and other materials during construction.
 1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

3.5 MASONRY JOINT REINFORCEMENT

- A. Provide continuous masonry joint reinforcement if indicated. Install with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
- B. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections.

3.6 CLEANING

- A. Clean stone masonry by dry brushing to remove mortar fins and smears before tooling joints, as work progresses.
- B. After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleanned for comparison purposes.
 - 2. Protect adjacent surfaces from contact with cleaner.
 - 3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
 - 4. Clean stone by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20, using job-mixed detergent solution.
 - 5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
 - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

3.7 MASONRY WASTE DISPOSAL

- A. Masonry Waste Disposal: Dispose of clean masonry waste, including broken masonry stones, waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.
 - 1. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
 - 2. Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

**SECTION 32 91 19
LANDSCAPE GRADING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Providing, placing on previously prepared subgrade, and grading topsoil to finish grade.

1.2 RELATED SECTIONS

- A. Division 01 - GENERAL CONDITIONS: Including but not limited to:
 - 1. Coordination of the Work,
 - 2. Submittals; Procedure for submittals, and
 - 3. Protection of the finished Work.
- B. Section 31 09 00 - Geotechnical Engineering, Inspection, and Testing: Geotechnical Engineer.
- C. Section 31 05 13 - Soil Materials: Topsoil materials.
- D. Section 31 10 00 - Site Preparation and Clearing: Preparation for land disturbance, protection of the Work, and stripping and stockpiling topsoil.
- E. Section 31 22 13 - Rough Grading: Site subgrade contouring; general cutting, grading, filling and rough contouring the site. Dewatering excavations and water control.
- F. Section 31 23 17 - Utility Trenching & Backfilling: Utility excavation, backfill and compaction. Excludes bedding and setting utilities. References this section for provision and placement of topsoil.
- G. Section 31 25 13 - Erosion & Sediment Control: Topsoil stockpile protection.
- H. Section 32 92 19 - Seeding: Temporary and permanent seeding. Topsoil testing.

1.3 SUBMITTALS FOR INFORMATION

- A. Section 01 33 00 – Submittal Procedures.
- B. Topsoil source.

PART 2 PRODUCTS

2.1 MATERIAL

- A. Topsoil: Fill Type T1 or T2 as specified in Section 31 05 13 – Soil Materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that building, utility and miscellaneous backfilling have been inspected.
- B. Verify that subgrade has been contoured and compacted and that uneven areas, low spots, and stockpiles have been eliminated.
- C. Do not place topsoil within areas yet to be disturbed by other trades. This may include utility, sidewalk, paving, trellis, sprinkler system or fencing operations.

3.2 SUBGRADE PREPARATION

- A. Establish limits, providing for smooth transition to undisturbed area or other finishes.
- B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products, cleaners, paint products, or waste concrete or asphalt.
- C. Scarify subgrade to depth of 3 inches where topsoil is scheduled. Re-scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.3 PLACING TOPSOIL

- A. Use all acceptable, on-site, stockpiled topsoil before importing topsoil. It shall be the Contractor's responsibility to determine the need to import topsoil to complete the project. Latent requests for additional costs due to importing topsoil will not be considered.
- B. Do not deliver or place topsoil in frozen, wet or muddy condition.
- C. Place topsoil in areas where seeding to thickness as scheduled. Manually spread topsoil close to trees, plants, site improvements, and buildings to prevent damage. Place topsoil during dry weather.
- D. Fine grade topsoil eliminating rough or low areas. Maintain profiles and contour of subgrade.
- E. Remove roots, weeds, rocks and foreign material while spreading.
- F. Lightly compact placed topsoil.
- G. Unless otherwise noted or indicated, compacted surface of placed topsoil shall be 1/2" below top of header boards, walks, pavements, and utility structures. Where upslope and against curb, flush with top of curb to allow positive drainage.
- H. All required topsoil (per schedule) shall be in place prior to any landscaping activities within the area to immediately receive landscaping.

- I. Leave stockpile area and site clean and raked, matching existing grade before placement of stockpile or proposed grade, as applicable, and ready to receive landscaping. Grade site surface to prevent free-standing surface water.

3.4 TOLERANCES

- A. Top of Topsoil: Plus or minus 1/2 inch adjacent to improvements; 1 inch within 100 feet of buildings or athletic or play fields; and 2 inches on surrounding fields and slopes.

3.5 PROTECTION

- A. Section 01 70 00 – Execution Requirements: Protection of Completed Work.
- B. Comply with Section 31 10 00 – Site Preparation and Clearing: Protection.
- C. Protect landscaping and other features remaining as final work.
- D. Protect any/all existing site improvements including structures, fences, sidewalks, utilities, paving and curbs.

3.6 SCHEDULES

- A. Compacted topsoil thickness at the following areas:
 1. Seeded Grass: 4 inches.
 2. Ground Cover Areas: 8 inches.
 3. Landscaping Beds : 12 inches.

END OF SECTION

**SECTION 32 91 19.13
TOPSOIL**

PART 1 GENERAL

1.1 Description:

- A. All topsoil will be imported to the job site in preparation for landscape installation. The work of this section consists of placing imported topsoil on a previously prepared sub-grade.

1.2 Submittals:

- A. Submit soil analysis report for imported topsoil from A&L Eastern Laboratories, Inc., 7621 Whitepine Road, Richmond, Virginia, tel: (804)743-9401, or other approved soil testing laboratory. Report shall cover soil textural classification (percentages of sand, silt, and clay), soil pH, and include additive recommendations. Testing will be at the expense of the Contractor.

1.3 Delivery, Storage and Handling:

- A. Do not deliver or place topsoil in frozen, wet, or muddy condition.

PART 2 PRODUCTS

2.1 Imported Topsoil:

- A. Fertile, friable, loamy soil, containing 5 to 10 percent organic matter; reasonably free from subsoil, refuse, roots, heavy or stiff clay, stones larger than 1 inch, coarse sand, noxious seeds, sticks, brush, litter, and other deleterious substances; suitable for the germination of seeds and the support of vegetative growth. The pH value shall be between 6.0 and 7.0.
- B. Soil Texture: Sand, 30 - 50 percent; silt, 30 - 40 percent; clay, 20 - 30 percent.

PART 3 EXECUTION

3.1 Placing Topsoil:

- A. Planting areas: Section 32 93 00.
- B. Grass Areas: Section 32 92 19.

END OF SECTION

**SECTION 32 92 19
PERMANENT SEEDING**

PART 1 GENERAL

1.1 Description: As follows:

- A. The work of this section consists of seeding, fertilizing, and mulching.

1.2 Product Handling:

- A. Seed: Deliver in acceptable condition in original, unopened containers with seed label attached to each container.
- B. Limestone: Deliver in original, unopened containers with identifying mark and analysis attached.
- C. Fertilizer: Deliver in original, unopened containers with analysis, type, and trade name attached.
- D. Deliver all materials to the site with their labels intact and legible. Replace materials that become wet or damaged at no additional expense to the Owner. Store in weatherproof storage area, free from the affects of the weather.

1.3 Project Conditions:

- A. Seed during recommended planting period or as approved.

- 1. All disturbed, non-planted areas of this contract are to be permanently seeded within three (3) days of finish grading, and shall be seeded within 7 days with temporary seeding if they are to be left idle in a disturbed state more than thirty (30) days.

1.4 Guarantee:

- A. The Contractor shall produce dense, vigorous, well established lawns and shall maintain lawn areas until final acceptance of the work by the Landscape Architect. Any areas which fail to show a uniform stand of grass shall be reworked, and reseeded at the Contractor's expense with the same seed as originally used thereon, and such reseeding shall be replaced until all required areas are covered with a satisfactory stand of grass. A satisfactory stand of grass shall be defined as a cover of living grass in which gaps larger than 4 inches are not occurring at final acceptance.

1.5 Quality Assurance:

- A. Provide only quality seeds as approved and certified by the Commonwealth of Virginia.

PART 2 - PRODUCTS

2.1 TOPSOIL: Section 32 91 19.13

2.2 Lime: As required by soil test.

- A. Agricultural limestone containing minimum of 85 percent carbonates. Minimum gradation: 100 percent passing a 10 mesh sieve; 98 percent a 20 mesh sieve; 55 percent a 60 mesh sieve; and 40 percent a 10 mesh sieve.
- 2.3 Fertilizer:
- A. Granular, or pelleted; type with at least 50 percent of the nitrogen in slowly available form. Organic fertilizer, and shall conform to applicable state fertilizer laws. It shall be uniform in composition, in granular form dry and free-flowing. For all grass and lawn areas it shall have a minimum guaranteed analysis of 6 percent nitrogen. Fertilizer, unless otherwise specified shall be delivered mixed as specified, in standard size, unopened containers, showing weight, analysis, and name of manufacturer.
1. Acceptable Organic fertilizer products:
 - a. Ringer 0% Phosphate Lawn Restore Fertilizer
 - b. Milorganite
 - c. Corn gluten meal (9-0-0 analysis)
 - d. Compost
 - e. Cottonseed Meal
 - f. Green Sense Lawn & Garden Fertilizer 6.2.4
 - g. Bradfield Products
 - h. Other approved organic fertilizer meeting specifications above
- B. Store in weatherproof place and in a manner that will be dry and its effectiveness unimpaired.
- 2.4 Seed:
- A. All permanent Grass seed and Temporary seed specified in this section will be manufactured by a seed company that can guarantee all seed shall be free of noxious weed seeds, cleaned Grade A recent crop seed. Seed company shall provide guaranteed germination of 80 percent.
- 2.5 Permanent Grass Seed:
- A. Seed mixture below is proportioned by weight.
1. Seed mixture shall consist of: 25% Kentucky Bluegrass (Mix of 3 varieties), 75% Turf Type Tall Fescue(Rebel 3D, Titan 2, Shenandoah, Finelawn 88, Anthem) complying with minimum germination, purity, weed content as specified in Virginia Seed and Sod laws, VDOT Standards. Kentucky 31 is NOT acceptable. Percentages determined by weight. All seed shall be certified seed. Cast seeds at 4 pounds per thousand square feet. Seeding shall be between March 1 and May 15, or August 16 and October 31.
- 2.6 No Mow Seed Mix:
- A. Seed mixture as below. Submit label to Landscape Architect for approval
1. No Mow seed mixture shall be a blend of Hard Fescue, Sheep Fescue, Chewings Fescue, Red Fescue and Creeping Red Fescue, complying with minimum germination, purity, weed content as specified in Virginia Seed and

Sod laws, VDOT Standards. Cast seeds at 5 pounds per thousand square feet. Seeding shall be between March 1 and May 15, or August 16 and October 31.

2. Seeded area shall be covered with biodegradeable erosion-control blanket.

2.7 Mulch:

- A. Clean wheat or barley straw, free from noxious weed seed and other harmful material. Commercial products may be used with approval.

2.8 Binder:

- A. Fiber mulch based tack binder such as "Enviro-Blend" by Conwed or equal. Apply at 25 lbs. per thousand square feet according to manufacturer's recommendations.

PART 3 - EXECUTION

3.1 Preparation:

- A. General: The Contractor shall prior to seeding operations, repair any ruts, depressions, eroded areas, as directed.

3.2 Grass Area Preparation:

- A. Loosen soil to a depth of three inches in all areas by approved method of scarification, by either pulverizing or disking the seedbed. Remove stones or foreign matter over three-quarters inch in diameter from soil surface.
- B. Lime deficiency of soil in grass areas shall be tested to a depth of 6 inches by a Soil Science Lab through seed contractor to determine whether lime is needed. Send results of tests to Landscape Architect.
- C. Finish Grade - immediately prior to seeding the bed shall be prepared by breaking, disking, harrowing, blading, dragging or other approved methods. The soil shall be thoroughly pulverized to minimum depth of approximately three inches and smoothed by means of raking or other approved methods. Raking shall be done by hand adjacent to structures, walks, curbing, and trees.
- D. Spread Fertilizer at rate specified by manufacturer for grass seed areas. Fertilizer shall be distributed evenly, by mechanical spreader, over all areas to be seeded. Fertilizer shall be applied not more than one week prior to seeding. Fertilizer to be uniformly distributed in the top 2 inches to 4 inches of seed bed.
- E. Final seed bed preparation shall be performed at such time that the seeding work will follow within three days, weather permitting.

3.3 Seeding:

- A. General: Seeding and straw cover shall be done during sunny weather conditions and when wind is five miles per hour or less.
- B. Method: Within three days of when the finish grading operations are performed (with no rain between operations) and after approved by the Landscape Architect the seed shall be applied at the rate specified above by means of an approved mechanical seed spreader which will provide a seeding depth of 1/8 inch to 1/4 inch. Seed in two

directions perpendicular to each other, using half of the specified amount in each application. Seeding shall be done using a Drill Seeder or a Brillion Seeder or approved equal.

3.4 Mulching:

- A. Immediately after rolling, apply mulch uniformly to a depth of 2 inches. Application by mechanical methods is preferred; however, mulch chopped or cut into short pieces will not be acceptable. Secure mulch in place by staking and tying or by spraying with binder. Apply binder at the rate of 6 to 10 gallons per 1,000 square feet.

3.5 Watering:

- A. After mulching, water with a mist spray soaking ground to minimum depth of 2 inches. Water as necessary until final inspection.

3.6 Clean-Up

- A. Upon completion of work, remove debris and leave area in clean, acceptable condition.

3.7 Maintenance and Protection:

- A. Maintain lawn including the preparation and reseeding of any bare areas, proper watering, refilling of rain-washed gullies and rutted areas, refertilizing, mowing, cultivation, weeding, disease and insect control, protective spraying, and all other procedures necessary to produce a normal healthy, and vigorous lawn. Maintain lawn until final acceptance.
- B. At least three mowings shall be completed in grass areas before the work will be accepted. Mower blades shall be set 2 1/2 inches to 3 inches high.
- C. Water all areas which have been seeded except when natural precipitation has provided the necessary moisture as determined by the Landscape Architect. Watering shall be done in a manner which will prevent erosion due to the application of excessive quantities, and the watering equipment shall be of a type that will not damage the finished surface. A minimum amount of rainfall would be two one inch rains per week.
- D. Protect seeded areas against traffic or other use by placing warning signs as approved by the Landscape Architect and protective fencing as specified.
- E. Should an area receive excessive run-off and become eroded, protect area long enough to establish grass. Use jute or excelsior mat.

3.8 Inspection:

- A. Contractor shall maintain grass by watering, weeding, fertilizing and re-seeding as necessary until lawn area is established and accepted. If grass and erosion mix areas are being readied for inspection, no individual area of any lawn shall have bare spots to cover more than 5 percent of individual lawn areas.
- B. Re-seed gaps larger than 4-inches in lawn area prior to final acceptance. This shall be accomplished through mechanical means using a slit-seeder or a core aerator.

END OF SECTION

SECTION 32 93 00
PLANTING

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes the following:
1. Trees
 2. Shrubs
 3. Groundcover
 4. Plants
 5. Plant soil mix

1.2 DEFINITIONS

- A. **Balled and Burlapped Stock:** Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.
- B. **Balled and Potted Stock:** Exterior plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of exterior plant required.
- C. **Bare-Root Stock:** Exterior plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for kind and size of exterior plant required.
- D. **Container-Grown Stock:** Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.
- E. **Fabric Bag-Grown Stock:** Healthy, vigorous, well-rooted exterior plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of exterior plant.
- F. **Finish Grade:** Elevation of finished surface of planting soil.

- G. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- H. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil.
- I. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

1.3 SUBMITTALS

- A. Planting Schedule: Indicating anticipated planting dates for exterior plants.
- B. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year. Submit before expiration of required maintenance periods.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A landscape installer whose work has resulted in successful establishment of exterior plants. Landscape installer to provide references.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when exterior planting is in progress.
- B. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches (150 mm) above ground for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- C. Observation: Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
 - 1. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver exterior plants freshly dug.
 - 1. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

- B. Do not prune trees and shrubs before delivery, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.
- C. Handle planting stock by root ball.
- D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.
 - 1. Heel-in bare-root stock. Soak roots in water for two hours if dried out.
 - 2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
 - 3. Do not remove container-grown stock from containers before time of planting.
 - 4. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.
- E. In the event of damage or rejection, immediately make all replacements necessary to the approval of the Landscape Architect and at no additional cost to the Owner.

1.6 COORDINATION

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 - 1. Spring Planting: March 1 through June 30.
 - 2. Fall Planting: October 1 through November 30.
 - 3. Other planting times will be allowed, depending on weather. No planting shall be done in frozen ground, when snow covers ground or when site is muddy.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.7 UTILITIES

- A. The exact location of all existing and proposed underground and overhead utilities shall be verified by the Contractor and he shall conduct his work so as to prevent interruption of service and damage to any system. Contact Miss Utility and have exact location of utilities verified. The Contractor shall protect existing structures and utility services and be responsible for their replacement if damaged by him or to make necessary adjustment in their location if required in

- order to complete the work of this contract.
- B. Contractor shall hand-dig within 2' of any existing underground utility.
 - C. Should the Contractor damage any utility during his work, he shall replace and/or repair the utility as it existed prior to the damage at his own expense.
 - D. In the event a utility line has been discovered for whatever reason, the contractor shall notify the Landscape Architect immediately of the said utilities and Landscape Architect shall then give instructions on placement of plants.

1.8 PLANT MAINTENANCE PERIOD

- A. Contractor's Maintenance:
 - 1. Contractor's responsibility to plant maintenance under this section shall commence when work is begun and continue until Final Completion Acceptance of the construction project. Maintenance shall include all necessary watering, cultivating, weeding, pruning only as necessary, straightening plants which lean or sag, adjustment of any plants which settle or are planted too low, and other procedures consistent with good horticultural practices which are necessary to insure normal, vigorous and healthy growth of all work under this contract.
 - 2. In the event that treatment or replacement is made necessary as a result of damage caused by circumstances which are beyond the Contractor's control, and not wholly or partially as a result of an act or omission of the Contractor, such treatment or replacement will be authorized by the Owner by Change Order in accordance with the General Conditions.
 - 3. Contractor shall supply to Landscape Architect a comprehensive maintenance program for all new plant materials on the site for the Owner's use. It should indicate such areas as, fertilizing, pruning, watering and general care necessary to insure survival of the material and good healthy plants.

1.9 CONTRACTOR'S GUARANTEE PERIOD

- A. Planting work shall be guaranteed for one (1) year from date of Substantial Completion. Replacement plants are guaranteed one year from their planting date.
- B. After Substantial Completion Acceptance of the construction project, if the Contractor is not responsible for maintenance because the Owner has taken-over this task, he is responsible to see that a proper maintenance program is being undertaken. The Contractor should make periodic site visits to insure that the Owner is supplying proper care for plant materials. Notify Landscape Architect in writing of observations within seven days of site visit.
- C. Should the Contractor not follow through on his inspection visits, and plant material dies due to lack of maintenance by the Owner, the Contractor could be held responsible and replacements made at his expense. It is his responsibility to advise the Landscape Architect of conditions that may affect his plant

materials, and the guarantee. This will be in effect for the full one year plant guarantee.

PART 2 PRODUCTS

2.1 TREE AND SHRUB MATERIAL

- F. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- G. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.
- H. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.
- I. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.2 SHADE AND FLOWERING TREES

- A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.
 - 1. Provide balled and burlapped trees.
 - 2. Branching Height: One-third to two-thirds of tree height, two-thirds preferred.
- B. Small Spreading Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:
 - 1. Stem Form: Single stem with one single leader.
 - 2. Provide balled and burlapped trees.
- C. Multistem Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:
 - 1. Stem Form: Clump.
 - 2. Provide balled and burlapped trees.

2.3 DECIDUOUS SHRUBS

- A. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.

1. Provide as indicated.

2.4 CONIFEROUS EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

- B. Form and Size: Specimen-quality, exceptionally heavy, tightly knit, symmetrically shaped coniferous evergreens and the following grade:

1. Provide as indicated.

2.5 BROADLEAF EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

1. Provide as indicated.

2.6 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, or bare root as specified, and complying with ANSI Z60.1.

2.7 PLANTS

- A. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed.

2.8 FERTILIZER

- A. No fertilizer to be added at time of planting.

2.9 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood.

- B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

2.10 STAKES AND TIES

- A. Tree Stakes: 2" x 2" wood or bamboo posts, 8' – 0" long. 3 per tree.
- B. Arbor Tie: $\frac{3}{4}$ " wide, 900 lb break strength, manufactured by Deep Root, 81 Longton Street, Suite 4, San Francisco, CA 94103, Tel: 800-458-7668. Guying Material: Arbotie manufactured by DeepRoot, Inc., Tel: 800-458-7668 or approved equal. Use manufacturer's specifications for proper installation.

2.11 PLANTING SOIL MIX

- A. Planting Soil Mix: Mix topsoil with the following soil amendments and fertilizers in the following quantities:
 1. For tree planting pits use Planting Soil "A".
 - a. Planting Soil "A" shall be topsoil, unamended. Topsoil will meet requirements of Section 32 91 19.13 - Topsoil.
 2. Shrubs shall receive the same soil mix as trees. Use Planting Soil "A".
 3. For perennial beds, use Planting Soil "B".
 - a. Planting Soil "B" shall be mixture of: one part humus, five parts topsoil. Topsoil will meet requirements of Section 32 91 19.13 - Topsoil.

PART 3 EXECUTION

3.1 EXAMINATION

- B. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.
- C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- D. As soon as practicable after utility locations have been verified by Miss Utility, lay out individual tree and shrub locations and areas for multiple exterior plantings. Stake locations of trees, outline areas of planting beds. Adjust locations when requested, and obtain Landscape Architect's acceptance of layout before planting. Make minor adjustments as required.

3.3 PLANTING BED ESTABLISHMENT

- A. Loosen subgrade of planting beds to a minimum depth as follows:

Area	Depth of Planting Soil Mix
For Perennial and Ground Cover Beds	6" Deep for entire bed
For Shrubbery Plant Beds	12" Deep for entire bed
For Tree Pits and Shrub Pits	12" Deep by 2.5 time ball dia.

Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Spread planting soil mix to a depth as indicated above but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

- a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil mix.

- B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

- C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.4 TREE AND SHRUB EXCAVATION

- A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter for balled and burlapped and container grown stock.
2. Excavate at least 12 inches (300 mm) wider than root spread and deep enough to accommodate vertical roots for bare-root stock.

- B. Subsoil removed from excavations may not be used as backfill.

- C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.

- D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

- E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.
- F. Install root barrier where indicated.

3.5 TREE AND SHRUB PLANTING

- A. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball 1-2" above adjacent finish grades. Trunk flare of trees shall be at finished grade.
 - 1. Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- B. Set container-grown stock plumb and in center of pit or trench with top of root ball flush with 1 inch (25 mm) above adjacent finish grades.
 - 1. Carefully remove root ball from container without damaging root ball or plant.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- C. Set fabric bag-grown stock plumb and in center of pit or trench with top of root ball 1 inch (25 mm) above adjacent finish grades.
 - 1. Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

3.6 TREE AND SHRUB PRUNING

- A. Prune only dead or damaged limbs or branches of trees and shrubs if directed by Landscape Architect. Do not cut tree leaders.

3.7 GUYING AND STAKING

- A. Upright Staking and Tying: Stake trees of 2- through 5-inch (50- through 125-mm) caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip-out. Use a minimum of 3 stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend at least 60 inches (1524 mm) above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. Support trees with two strands of tie with tree trunk. Allow enough slack to avoid rigid restraint of tree. Install arbor tie per manufacturer's instructions. Use the number of stakes as follows:
 - 1. Use 3 stakes for trees up to 14 feet (4.2 m) high and up to 3 inches (75 mm) in caliper. Space stakes equally around trees. Stagger vertical attachment point of ties to tree. Do not attach all ties to same location on trunk.

3.8 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants as indicated.
- B. Dig holes large enough to allow spreading of roots, and backfill with planting soil.
- C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING BED MULCHING

- A. Mulch backfilled surfaces of planting beds and other areas indicated.
 - 1. Organic Mulch: Apply 3-inch (75-mm) average thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.

3.10 CLEANUP AND PROTECTION

- A. During exterior planting, keep adjacent pavings and construction clean and work area in an orderly condition.
- B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.11 DISPOSAL

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

3.12 FINAL INSPECTION

- A. Contractor shall notify the Owner and Landscape Architect upon completion of guarantee. Contractor shall request final inspection prior to end of guarantee period.
- B. Should any plant material be dead, or in an unhealthy state of growth as determined by the Landscape Architect at the end of the one year period, Contractor shall make all work acceptable and request a reinspection by the Owner and Landscape Architect. Any replaced plant material is guaranteed one year from the replacement plants' planting date.

END OF SECTION

SECTION 33 05 13
PRECAST TRENCH DRAINS

PART 1 GENERAL

1.1 SECTION INCLUDES (including but not limited to)

- A. Work includes:
1. Furnish all labor, materials, tools, equipment, and services required to provide complete and functional trench drains, and related catch basins, as indicated, on the Drawings.
 2. Completely coordinate with work of all other trades.
 3. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to, or necessary for sound, secure and complete installation.

1.2 RELATED SECTIONS

- A. Applicable sections of Division 01 - GENERAL CONDITIONS: Including but not limited to:
1. Coordination of the Work.
 2. Soil, aggregate and concrete testing, compaction testing, and inspection of bearing surfaces.
 3. Material delivery storage and handling.
 4. Project Record Document requirements.
 5. Procedures for submittals.
- B. Section 32 13 13 -Concrete Pavement.
- C. Division 03 - Concrete.

1.3 SYSTEM

- A. Description: System of pre-sloped 9.0' long sections with built-in 1.0% slope with drainage accessories and gratings of length and configuration indicated on Drawings. Manufactured and installed to withstand Class E loads and to maintain performance criteria stated by the manufacturer without defects, damage or failure.

1.4 REFERENCES AND QUALITY ASSURANCE

- A. References:

AMERICAN SOCIETY OF TESTING & MATERIALS (ASTM)

1. Ductile iron complying with ASTM: A536-84.
 2. Galvanized steel complying with: ASTM: A569 base with G90 zinc coating.
- B. Design criteria: Gratings & covers to withstand loadings of:
1. Class E. Extra heavy duty, high speed 40-55 Kg/Scm (576-775 PSI).

1.5 QUALITY ASSURANCE

- A. Section 01 40 00 – Quality Requirements.
- B. Installer qualifications:
 - 1. Use only workmen thoroughly familiar and experienced with manufacturer's installation requirements.
 - 2. Inexperience of the workmen shall be no excuse for an unsatisfactory finished product.
- C. Source quality control:
 - 1. Manufacturer must have continuing in-house quality control system to assure highest standards of quality.
- D. Allowable tolerances:
 - 1. Setting; plus/minus 1.5mm (1/16 inch).
- E. Section 01 41 10 – Inspection and Testing Services.
- F. Section 31 09 00 – Geotechnical Engineering, Inspections, and Testing: Concrete.

1.6 SUBMITTALS FOR REVIEW

- A. Section 01 33 00 – Submittal Procedures.
- B. Shop drawings: Indicating layout of system with connections and accessories.
- C. Product data: Proving proposed products comply with specified requirements.
- D. Project information: Test reports: Proving compliance with specified attributes.

1.7 SUBMITTALS FOR INFORMATION

- A. Section 01 33 00 – Submittal Procedures.
- B. Project closeout data:
 - 1. Operating and maintenance data, indicating requirements for periodic inspection.
 - 2. Warranty.

1.8 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations and top and invert elevations of trench drain, related catch basins, pipe connections, etc.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Store materials protected from exposure to

harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer.

- B. Perform in manner to preclude damage to components and surroundings.

1.10 JOB CONDITIONS

- A. Existing conditions: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays. Verify that base, to receive system, has been compacted to requirements of Section 31 22 13 – Rough Grading.
- B. Protection: Assure that component parts are undamaged prior to installation and that installed system is protected from damage until final acceptance of project.
- C. Sequencing: Assure that system is completed and tested prior to placing surrounding paving.

1.11 WARRANTY

- A. Written warranty:
 - 1. Signed jointly by installer, manufacturer and Contractor.
 - 2. Warrant installation for a period of one year from date of Substantial Completion.

PART 2 PRODUCTS

2.1 Components: Trench Drain:

- A. ACO Drain K100S Polymer Concrete System:
 - 1. Material: Polymer Concrete.
 - 2. Channels: 4" internal width.
 - 3. Slope: 0.6% presloped.
 - 4. Metal Edge Rail: Galvanized Steel.
 - 5. Grates: Ductile iron, ADA compliant, slotted.
 - 6. Grate Locking System: Bolts – 2 per 18" on grate.
 - 7. Grate Load Class: Class E – 56,000 lb. in compliance with DIN 19580 applicable for commercial traffic.
 - 8. Catch Basins: Type 600.
 - 9. Outlets: Channel bottom PVC outlets, 6" Schedule 40.
- B. Accessories:
 - 1. End plates.
 - 2. Outlet End Cap.
 - 3. Vertical outlet adapter.
 - 4. Locking devices.
 - 5. Sealant.
 - 6. Sidewall extenders.
 - 7. Installation device.

2.2 ENCASEMENT CONCRETE

- A. Concrete to support and surround drain system shall be VDOT Std. Class A5 with high early strength. Slump shall be per Manufacturer's recommendations and acceptable to Geotechnical Engineer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Assure that substrate is evenly graded and properly compacted and that minimum clearance for concrete encasement is provided.

3.2 INSTALLATION

- A. In accordance with Manufacturer's instructions.
- B. Utilize Manufacturer's approved installation device to assure proper joints, drawn tightly together with device.

3.3 FIELD QUALITY CONTROL

- A. Assure that units are installed so drain slopes are correct, that units align with adjacent paving and that connection with other drainage piping or structures are as indicated.

3.4 CLEANING

- A. Leave system and surrounding area broom clean.

3.5 CONCRETE FINISH SCHEDULE

- A. If within or adjacent to other concrete surfacing, finish per schedule applying to said concrete or detail, as applicable.
- B. If isolated or independent of other concrete surfacing, VDOT Std. Class A5 with high early strength concrete, gray color, smooth troweled finish with radius tooled edges.

3.6 TRENCH DRAIN SCHEDULE

- A. All grates shall be lockable. Ductile Iron grate suitable for H20 loading, ADA compliant. Length and configuration as shown on Drawings.

END OF SECTION

SECTION 33 11 16
WATER MAINS AND SERVICES

PART 1 GENERAL

1.1 SECTION INCLUDES (but is not limited to)

- A. Pipe and fittings for exterior water system including distribution main, domestic service and fire service, as applicable.
- B. Valves, fire hydrants, fire department connection, and domestic water hydrants.
- C. Bedding and compaction.
- D. Adjustment of existing utility structures to meet proposed work.
- E. Provide an approved, operational underground exterior water service and fire service piping system from five (5) feet outside the building through connection to existing system.

1.2 RELATED SECTIONS

- A. Applicable sections of Division 1 - GENERAL CONDITIONS: Including but not limited to:
 - 1. Section 01 31 00 – Coordination of the Work.
 - 2. Section 01 33 00 – Submittal Procedures: Procedures for submittals.
 - 3. Section 01 40 00 – Quality Requirements: Aggregate and concrete testing.
 - 4. Section 01 56 00 – Temporary Facilities and Controls: Dewatering excavations and water control.
 - 5. Section 10 60 00 – Products Requirements: Product delivery, handling, storage, and protection.
 - 6. Section 01 70 00 – Execution Requirements: Contract Closeout, Project Record Documents.
- B. Section 31 05 13 – Soil Materials: Soil and aggregate materials.
- C. Section 31 05 16 – Aggregate Materials.
- D. Section 31 10 00 - Site Preparation and Clearing: Preparation for land disturbance, protection of the Work.
- E. Section 31 22 13 – Rough Grading.
- F. Section 31 23 17 - Utility Trenching & Backfilling: Excavation, backfill, compaction, testing, Trace Wire & ID Tape.
- G. Section 33 13 00 - Disinfection of Water Distribution System: Disinfection of site service utility water piping.

1.3 REFERENCES

- A. AMERICAN SOCIETY OF TESTING & MATERIALS (ASTM)
- B. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- C. AMERICAN WATER WORKS ASSOCIATION (AWWA)
- D. AMERICAN WELDING SOCIETY (AWS)
- E. FACTORY MUTUAL RESEARCH CORP. (FM)
- F. MANUFACTURERS' STANDARDS SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)
- G. NATIONAL FIRE PREVENTION ASSOCIATION (NFPA)
- H. UNDERWRITERS LABORATORIES (UL)
- I. UNI-BELL PLASTIC PIPE ASSOCIATION (UNI)
- J. VIRGINIA DEPARTMENT OF HEALTH (VDH)
 - 1. Virginia Department of Health (VDH) "Waterworks Regulations," latest edition, hereinafter Waterworks Regulations.
- K. SOILS
 - 1. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
 - 2. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 inch Drop.
 - 3. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 4. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- L. COPPER
 - 1. ANSI/ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
 - 2. ANSI/ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
 - 3. ASTM B32 - Solder, Metal.
 - 4. ASTM B88 - Seamless Copper Water Tube.
 - 5. AWS A5.8 - Brazing Filler Metal.
- M. PVC
 - 1. ASTM D1785 - Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, 120.
 - 2. ASTM D2241 - Polyvinyl Chloride (PVC) Plastic Pipe, (SDR-PR).
 - 3. ASTM D2672 - Bell-End Polyvinyl Chloride (PVC) Plastic Pipe.
 - 4. ASTM D2466 - Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40.
 - 5. ASTM D2467 - Socket-Type Polyvinyl Chloride (PVC) Plastic Pipe Fittings,

- Schedule 80.
6. ASTM D2564 - Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings.
 7. ASTM D2774 - Underground Installation of Thermoplastic Pressure Piping.
 8. ASTM D3139 - Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.
 9. ASTM D2855 - Making Solvent-Cemented Joints With Poly Vinyl Chloride (PVC) Pipe and Fittings
 10. ASTM F402 - Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings
 11. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 12. ANSI/AWWA C900 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.
 13. UNI B3 - Installation of Polyvinyl Chloride (PVC) Pressure Pipe Complying With AWWA C900.
- N. DUCTILE IRON
1. ANSI/AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 2. ANSI/AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and Other liquids.
 3. ANSI/AWWA C110 - Gray Iron and Ductile Iron Fittings, 3 Inch Through 48 Inches, for Water and Other Liquids.
 4. ANSI/AWWA C111- Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.
 5. ANSI/AWWA C115- Rubber-Gasket Joints for Ductile Iron and Grey-Iron Flanged Pressure Pipe and Fittings.
 6. ANSI/AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
 7. ANSI/AWWA C153 - Ductile-Iron Compact Fittings, 3 Inch Through 16 Inch, for Water and Other Liquids.
 8. ANSI/AWWA C600 - Installation of Ductile-Iron Water Mains and Appurtenances.
 9. ANSI/AWWA C606 - Grooved and Shouldered Type Joints.
 10. ASTM A48 - Gray Iron Castings.
- O. PE PIPE
1. AWWA C901 - Polyethylene (PE) Pressure Pipe, Tubing, and Fittings, 1/2 inch through 3 inch, for Water
 2. ASTM D3035 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.
- P. VALVES, ETC
1. ANSI/AWWA C500 - Gate Valves (Double Disc), 3 through 48 in NPS, for Water and Sewage Systems.
 2. ANSI/AWWA C502 - Dry Barrel Fire Hydrants.
 3. ANSI/AWWA C504 - Rubber Seated Butterfly Valves.
 4. ANSI/AWWA C508 - Swing-Check Valves for Waterworks Service, 2 in through 24 in NPS.
 5. ANSI/AWWA C509 - Resilient Seated Gate Valves 3 in through 12 in NPS, for Water and Sewage Systems.

6. AWWA C550 - Protective Interior Coatings for Valves and Hydrants.
7. ANSI/AWWA C600 - Installation of Ductile-Iron Water Mains and Appurtenances.
8. MSS SP80 - Bronze Gate, Globe, Angle and Check Valves.
9. MSS SP71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends.
10. UL 246 - Hydrants for Fire - Protection Service.

Q. FIRE SERVICE

1. NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances."
2. NFPA 13, "Standard for the Installation of Sprinkler Systems."

1.4 SUBMITTALS FOR REVIEW

- A. Section 01 33 00 – Submittal Procedures: Submittals.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.
- C. Manufacturer's Certificate: Certify that above referenced products meet or exceed specified requirements.
- D. Submit NFPA "Contractor's Materials and Test Certificate for Underground Piping." Use NFPA 13 Version with Owner Representative signature block.

1.5 PROJECT RECORD DOCUMENTS

- A. Section 01 70 00 – Execution Requirements: Contract Closeout.
- B. Accurately record actual locations of piping mains, valves, connections, and invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.
- D. Certify in writing to the Owner and to the Architect that the "System" has been approved and is ready for use.
- E. Maintenance Data: Submit maintenance data and parts list for the fire water system materials and products.

1.6 QUALITY ASSURANCE

- A. Code Compliance: Comply with:
 1. VDH Waterworks Regulations,
 2. Local water system standards and specifications,
 3. Local Fire Department/Marshal Regulations or Standards: Comply with governing regulations pertaining to hydrants, including hose coupling threading and matching of connections, and
 4. Owner's Insurance Company requirements.

- B. Install fire water systems in accordance with NFPA 24.
- C. Valves: Manufacturer's name and pressure rating shall be marked on valve body.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 – Product Requirements: Deliver, store, protect and handle products to site: Material & Equipment.
- B. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.1 PIPE & FITTINGS (4" & larger)

- A. Ductile Iron Pipe (buried applications): AWWA C151/ANSI 21.51, minimum thickness Class 51 with a minimum working pressure of 250 psi.
 - 1. Fittings: Ductile or grey iron, AWWA C110/ANSI 21.10 with a pressure rating not less than the pipe or AWWA C153/ANSI A21.53 with a working pressure of not less than that of the pipe.
 - 2. Joints: Mechanical joints per AWWA C111.
 - a. Bituminous Coating & Cement Lining: AWWA C104, Standard thickness for pipe and fittings.
 - b. Examples Meeting the Criteria or 1-3 above include, but are not necessarily limited to:
 - 1. Clow Super Bell-Tite Push-on Joint Ductile Iron Pipe.
 - 2. Pipe Tyton (Push-on) Joint Ductile Iron Pipe.
 - 3. Griffin Super Bell-Tite Push-on Joint Ductile Iron Pipe.
- B. PVC Pipe (4" - 12"): ANSI/AWWA C900 pressure Class 150 (DR18) with ductile iron pipe equivalent OD.
 - 1. Joints: ASTM D3139 push-on or ASTM D3139 and AWWA C111 compression type mechanical joints, as applicable. ASTM F477 gaskets for push-on joints for pipe and AWWA C111 gaskets for push-on joints and mechanical joints for joint connections between pipe and metal fittings, valves, and accessories.
- C. Examples Meeting the above Criteria include, but are not necessarily limited to:
 - 1. Johns-Manville Blue Brute PVC Water Pipe, DR18, Class 150
 - 2. Johns-Manville PVC Class Water Pipe, DR18, Class 150
 - 3. Clow Super Main 900 Water Main, DR18, Class 150
 - 4. CertainTeed Vinyliron Pipe, DR18, Class 150
 - 5. National C900 Pipe, DR18, Class 150
 - 6. Extrusion Technologies Inc. (ETI) C900, DR18, Class 150
- D. Fittings: ANSI/AWWA C110, ductile iron, with a pressure rating not less than the pipe and AWWA C104 standard thickness cement lining.

2.2 PIPE & FITTINGS (smaller than 4-inch diameter)

- A. Copper Tubing (for water piping only): ASTM B88, Type K:

1. Fittings:
 - a. ANSI/ASME B16.18, cast copper and brass, solder joint fittings, or
 - b. ANSI/ASME B16.22, wrought copper, solder joint fittings.
 2. Joints:
 - a. ASTM B32, 95-5 tin antimony solder, or
 - b. Plumbing Code approved lead free solder, or
 - c. Compression connection, as applicable.
- B. Polyvinyl Chloride (PVC) Pipe: ASTM D2241, SDR-21 (200 psig rated).
1. Joints: ASTM F477 rubber gaskets for push-on pipe.
 2. Pipe and fittings shall bear the seal of approval of the National Sanitation Foundation for potable water service.
 3. Pipe and fittings shall be of the same PVC material and shall be one of the following pipe/fitting combinations, as marked on the pipe and fitting, respectively: PVC 2120/PVC II; PVC 2116/PVC II.
 4. Examples Meeting the above Criteria include, but are not necessarily limited to:
 - a. Johns-Manville Ring-Tite PVC Pressure Pipe (D2241) Bell & Spigot
 - b. Clow PVC Bell-Tite Pressure Rated Pipe (D2241) Bell & Spigot

2.3 INSULATING JOINTS

- A. Provide between pipes of dissimilar metals a rubber gasket or other approved type of insulating joint or dielectric coupling which shall effectively prevent metal-to-metal contact between adjacent sections of piping.

2.4 GATE VALVES - 3 Inches through 14 Inches

- A. UL/FM Rated, Iron or ductile iron body, bronze trim, non-rising stem with square nut, single wedge, rubber encapsulated resilient seat, mechanical joint ends, control rod, available as post indicator, extension box and valve key. ANSI/AWWA C509 except with wall thicknesses exceeding the min. requirements of AWWA C153.
1. Valves shall have a double O-ring stem seal, a minimum stem diameter of 7/8 inch for valves larger than six (6) inches, and shall open left (counter-clockwise).
 2. Valves shall be designed for a working pressure not less than that specified for the connecting pipe.
 3. Valves shall be coated inside and out with a fusion bonded epoxy coating meeting AWWA C550.
 4. Valves for above ground mounting or installed in vaults shall have flanged ends.
 5. Valves for buried installation shall have mechanical joints conforming to AWWA Std. C111 unless otherwise specified.
 6. Gate valves shall be supplied from a single manufacturer.
 7. Supply post indicator where indicated on the Drawings or as required by NFPA 24.
 8. Examples meeting the above criteria include, but are not necessarily limited to:
 - a) American Flow Control Model AFC-2500, by American Darling Valve (Ductile Iron)

2.5 SWING CHECK VALVES 4 inches to 24 inches

- A. Check valves shall conform with the specifications in ANSI/AWWA Standard C508. Valves shall be iron body, bronze trim, 45 degree swing disc, renewable disc and seat, flanged ends. Valves shall be equipped with an outside weighted arm. Provide piston type anti-slam device on all check valves where indicated.

2.6 WATER METER

- A. Service meters are required as shown on the Drawings.
- B. Meter box shall be as detailed on the Drawings. Allow for proper delivery time.
- C. Meter Assembly: Provided within vault as detailed on the Drawings.

2.7 FROSTPROOF YARD HYDRANT

- A. Provide a self-draining, non-freezing, compression type yard hydrant.
- B. A lockable feature is required.
- C. Riser shall be steel pipe with a cast iron casing guard.
- D. Principal interior operating parts shall be brass and removable from yard hydrant for servicing without excavation.
- E. Yard hydrant shall be set in four cubic yards (4 CY) of crushed stone to allow for proper drainage.
- F. Yard hydrant shall be the #909 Corn King Yard Hydrant, manufactured by the John C. Kupferle Foundry Company.

2.8 ACCESSORIES

- A. General: Provide flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required for a complete and operational system.
- B. Structure top adjustments: Provide grade rings, brick and mortar, or extensions as required for adjusting structure top elevations to meet proposed finish grades.
- C. Thrust Block/Anchorages: Provide at all tees, wyes, crosses, plugs, caps, bends, valves and hydrants.
- D. Valve Box: Each valve on buried piping shall be provided with an adjustable cast-iron valve box of a size suitable for the valve. Provide each cast-iron box with a heavy coat of bituminous paint. The head shall be round and the lid shall have the word "WATER" cast on it. The least diameter of the box shaft shall be 5.25 inches.
- E. Trace Wire for Non-Metallic Piping: Comply with Section 31 23 17 - Utility

Trenching & Backfilling.

- F. Buried Utility Warning and Identification Tape: Comply with Section 31 23 17 - Utility Trenching & Backfilling.
- G. Identification Tags and Plates: Provide valves with tags or plates numbered and stamped for their usage. Plates and tags shall be of brass or non-ferrous metal and shall be mounted or attached to the valve.
- H. Rim Adjustments: Provide pre-cast grade rings or install brick and mortar as necessary to level, raise or lower existing or new manhole frames and covers to meet finish grade. Adjustments of 8 inches or less in height shall not be considered for additional compensation.

2.9 BEDDING MATERIALS

- A. Bedding & Haunching: Coarse Aggregate Type A1 (Utility Bedding, Select Backfill) as specified in Section 31 05 16 - Aggregate Materials.
- B. Cover Bedding/Initial Backfill: Soil Type S1 or S2 as specified in Section 31 05 13 - Soil Materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Coordinate with the WVVA for all required meetings, inspections, and approvals.
- B. Verify that building service connection, point of water service connection and municipal utility water main size, location and invert are as indicated.
- C. Verify that grades are within six (6) inches of finished subgrade prior to the commencement of this work. Minimum clear cover over all water pipe shall be three (3) feet.
- D. Inspect all new water piping material upon receipt and immediately prior to installation to verify that it is in acceptable condition and proper working order. Mark all damaged material, remove it from the site at the first opportunity and replace it promptly so the work will not be delayed.
- E. For new and existing water utilities affected by new work, verify that structure top elevations have been adjusted to meet proposed finished grades.

3.2 PREPARATION

- A. Provide adequate means and methods for lowering sections of pipe and associated items into trenches. Do not drop or dump pipe, fittings, valves, or any other water piping material.
- B. Have all necessary arrangements made to complete the work and place it in operation without delays.

C. Prepare pipe connections to equipment with flanges or unions.

3.3 SEPARATION

A. Water Piping Installation Parallel to Sewer Piping

1. Normal Conditions: Water piping shall be laid at least ten (10) feet horizontally from a sewer or sewer manhole wherever possible, measured edge to edge.
2. Unusual Conditions: When local conditions prevent ten (10) feet horizontal separation, the water piping may be laid closer to a sewer or sewer manhole provided that:
 - a. The bottom (invert) of the water piping shall be at least 18 inches above the top (crown) of the sewer piping.
 - b. Where this vertical separation cannot be obtained, the sewer piping shall be constructed of AWWA-approved water pipe and pressure tested in place without leakage prior to backfilling.
 - c. The sewer manhole shall be of water-tight construction and tested in place.

B. Water Piping Installation Crossing Sewer Piping

1. Normal Conditions: Water piping crossing above sewer piping shall be laid to provide a separation of at least 18 inches above the top (crown) of the sewer piping.
2. Unusual Conditions: When local conditions prevent the vertical separation described above, the following construction shall be used:
 - a. Sewer piping passing over or under water piping shall be constructed of AWWA-approved water pipe and pressure tested in place without leakage prior to backfilling.
 - b. Water piping passing under sewer piping shall, in addition, be protected by providing the 18 inch vertical separation described above, adequate structural support for the sewer piping to prevent excessive deflection of the joints and the settling on and breaking of the water piping, and that the length (min. 18 feet) of the water piping be centered at the point of crossing so that joints shall be equidistant and as far as possible from the sewer piping.

C. Sewer Manholes

1. No water piping shall pass through or come in contact with any part of a sewer manhole.

3.4 BEDDING

- A. Excavate pipe trench in accordance with Section 31 23 17 - Utility Trenching & Backfilling for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated. See Drawings for trench detail.
- B. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches (150 mm) compacted depth, compact to 95 percent. Continue until pipe springline elevation is reached and hand excavate an accurate pipe shape to invert required. After setting pipe, where hand excavation is irregular against pipe, hand fill and tamp for an even fit tight to pipe at springline.

- C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.5 INSTALLATION - PIPE

- A. Connection to Existing Water Systems: Connection to existing system will be made by the Contractor and coordinated with the Western Virginia Water Authority. Use tapping and drilling machine valve and mechanical joint type sleeves for connections to be made under pressure. Bolt sleeves around mains; bolt valve conforming to AWWA C500 to the sleeve. Open valve, attach drilling machine, make tap, close valve, and remove drilling machine, all without interruption of service. Notify the Owner in writing at least fifteen (15) days prior to the date the connections are required; receive approval before any service is interrupted. Furnish all materials and labor required to make connections into the existing water supply systems.
- B. The Contractor shall be responsible for all public notification of service interruptions of the water main. Comply with all WAWA requirements regarding safety, temporary services and installation procedures.
- C. The Contractor shall comply with the Waterworks Regulations pertaining to separation of water and sanitary sewer.
- D. Establish elevations of buried piping to ensure not less than 3 ft (900 mm) of cover.

3.6 UTILITY ADJUSTMENT

- A. Adjust the tops of all affected water utility structures whether new or existing to meet finished grades. Provide grade rings, brick and mortar, or extensions for existing or new structures such that tops meet proposed finish grades. Adjustments of 8 inches or less in height shall be made at no additional cost to the Owner.
- B. Coordinate timing of adjustment work to be prior to stone base applications for paved areas and prior to topsoil applications in lawn spaces.

3.7 DUCTILE IRON

- A. Install ductile iron piping and fittings in accordance with ANSI/AWWA C600.

3.8 POLY-VINYL CHLORIDE (PVC)

- A. Install PVC piping and fittings to ASTM D2774.
- B. Inspect pipe, fittings, valves, and accessories before and after installation; those found defective shall be replaced with new materials. Ream pipe and tube ends and remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, valves, and accessories, removing scale and dirt, on inside and outside, before assembly and maintain in a clean condition.

- C. Route pipe in a straight line, unless otherwise indicated on the Drawings. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying.
- D. Cut pipe accurately to measurements established at the site and work into place without springing or forcing and making proper provision for expansion and contraction of piping without stressing pipe or joints. Replace pipe or fitting that does not allow sufficient space for proper installation of joint material with new pipe or fittings of proper dimensions. Blocking or wedging between bells and spigots will not be permitted.
- E. Install pipe to indicated elevations and grade to within tolerance of 5/8 inch (20 mm). Ensure firm and uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where indicated and where necessary for fastening work into place. Keep trenches free of water. At the end of each day's work, close open ends of pipe temporarily with wood blocks or bulkheads.
- F. Install access fittings to permit disinfection of water system performed under Section 33 13 00 - Disinfection of Water Distribution System. Position drains at low points.
- G. Conduct testing.
- H. Form and place concrete for thrust blocks at each elbow or change of direction of pipe main, vertical and horizontal, and behind fire hydrant as recommended by manufacturer. See detail on the Drawings.
- I. Install trace wire continuous over top of non-metallic pipe. Coordinate with Section 31 23 17 - Utility Trenching & Backfilling.
- J. Place cover bedding/initial backfill to depth indicated in trench section on the Drawings, compacted to 95%.
- K. Backfill pipe trench in accordance with Section 31 23 17 - Utility Trenching & Backfilling for work of this Section.

3.9 SPECIAL REQUIREMENTS FOR INSTALLATION OF DISTRIBUTION PIPING

- A. Ductile Iron Pipe and Fittings:
 - 1. AWWA C600 for pipe installation, joint assembly, valve and fitting installation, and thrust restraint, except as otherwise specified hereunder. Provide AWWA C600 joint assembly for push-on joints. Provide AWWA C600 joint assembly for mechanical joints and with the recommendations of Appendix A to AWWA C111. Make flanged joints up tight; avoid undue strain on flanges, fitting, valves, and other accessories. Use full-sized bolts for the bolt holes; use of the undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted. Do not allow adjoined flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without overtraining the flange. When any

flanged pipe or fitting has dimensions that do not allow the making of a proper flanged joint as specified for flanged joints, except that bolts with insulating sleeves shall be full size for the bolt holes. Assure that there is no metal-to-metal contact between dissimilar metals after joint has been assembled.

B. Polyvinyl Chloride (PVC) Pipe and Fittings:

1. UNI B3 for laying of pipe, joining PVC pipe to fittings and accessories, and setting of hydrants, valves, and fittings, except as specified hereunder. Make push-on joints with elastomeric gaskets using either elastomeric gasket bell-end pipe or elastomeric gasket couplings. Use push-on joint connections to metal fittings, valves, and other accessories, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint.
2. Use an approved lubricant recommended by the pipe manufacturer for push-on joints. Assemble push-on joints for pipe-to-pipe joint connections in accordance with the requirements of UNI B3 for laying the pipe. Assemble push-on joints for connection to fittings, valves, and other accessories with the requirements of AWWA C600 for joint assembly. Assemble compression-type joints and mechanical joints with the gaskets, glands, bolts, nuts, and internal stiffeners in accordance with the requirements of UNI B3 and AWWA C600, and Appendix A to AWWA C111. Cut off spigot end of pipe for compression-type joint and mechanical-joint connections and do not re-bevel.

C. Pipe Anchorage:

1. Provide anchorage of buried piping shall be installed at all 22.5 degrees and sharper bends, and tees. Dead ends of piping shall be securely blocked in the direction of flow.
2. Provide reaction anchors of concrete blocking, metal harness, retainer gland type, or restrained joint type pipe at all changes in direction of pressure pipelines and as shown on the Drawings.
3. Use of metal harness restraints shall be approved by the Engineer.
4. Concrete thrust blocks (reaction backing) shall have a minimum compressive strength of 3000 psi. Dead ends restrained with concrete shall have the concrete bearing solidly against the piping and affording a minimum of 3 square feet of bearing area against a vertical trench face (undisturbed earth) for 3- and 4-inch piping, and in accordance with the drawing details for piping 6-inch diameter and larger.

3.10 SETTING OF VALVES AND VALVE BOXES

A. Valve, Air Release, Meter and Blow-Off Chambers (as applicable):

1. Drain to surface where not subject to flooding by surface water or to absorption pit located above seasonal water table elevation per Waterworks Regulations Section 3.53 C, otherwise to manufacturer's recommendation.
2. Install valves with operator stems in the vertical plane through the pipe axis and perpendicular to the pipe axis. Locate valves where shown on the Drawings. Thoroughly clean before installation. Check valves for

- satisfactory operation.
3. Equip all underground valves without gearing or operators with valve boxes. Set box in alignment with valve stem centered on valve nut. Set the valve box to prevent transmitting shock or stress to the valve. Set the box cover flush with the finished ground or pavement surface.
 4. Valve, Air Release, Meter and Blow-Off Chambers
 - a. Drain to surface where not subject to flooding by surface water or to absorption pit located above seasonal water table elevation per Waterworks Regulations Section 3.53 C, otherwise to manufacturer's recommendation.
 - b. Provide chambers/boxes in accordance with manufacturer's recommendations and of adequate size to permit ease of access and maintenance.

3.11 SPECIAL REQUIREMENTS FOR INSTALLATION OF WATER SERVICE PIPING

- A. Metallic Piping:
 1. Install pipe and fittings in accordance with the general requirements for installation of piping and with the applicable requirements of AWWA C600 for pipe installation, except as otherwise specified in the following paragraphs.
- B. Joints for Copper Tubing:
 1. Cut copper tubing with square ends; remove fins and burrs. Replace dented, gouged, or otherwise damaged tubing with new tubing. Before making joint, clean ends of tubing and interior of fitting or coupling with wire brush or abrasive. Apply a rosin flux to the tubing end and on recess inside of fitting or coupling. Insert tubing end into fitting or coupling for the full depth of the recess and solder. For compression joints on flared tubing, insert tubing through the coupling nut and then flare tubing with flaring tool.
- C. Flanged Joints:
 1. Make flanged joints up tight; avoid undue strain on flanges, valves, fittings, and accessories.
- D. PVC Piping
 1. Install pipe and fittings in accordance with the general requirements for installation of piping and with the applicable requirements of ASTM D2774 and ASTM D2855, except as modified herein. ASTM F402 for safe handling of solvent cements.
 2. Jointing
 - a. Make solvent-cemented joints and assemble in accordance with ASTM D2855. Make pipe joints to other pipe materials in accordance with the recommendation of the PVC pipe manufacturer, as approved.
- E. Installation of Valves and Valve Boxes:
 1. Valves and valve boxes shall be set plumb, with valve boxes centered directly over the valves. Valve boxes shall be located outside the area of the roads and streets whenever possible. Earth fill shall be tamped around the valve box to a distance of 4 feet on all sides of the box, or to the

undisturbed trench face if less than 4 feet. Clean foreign matter from interior of valves before installation. Stuffing boxes shall be tightened and the valve shall be inspected in open and closed positions to ensure that all parts are in proper working order.

2. Install a full-ported shut-off valve below each Air Release or Combination Air Valve in the event servicing is required.

3.12 FIELD TESTS AND INSPECTIONS OF WATER MAINS

- A. Perform all field tests, and provide all labor, equipment, and incidentals required for testing. The Contractor shall produce evidence, when required, that any item of work has been constructed in accordance with contract requirements. Allow concrete to cure a minimum of 5 days before testing any section of piping where concrete thrust blocks have been provided.
- B. Field Testing of System:
 1. The Contractor may backfill over the pipe as laid, except as noted below. The bell holes shall either be left open or reopened for a visual inspection of the joints during the test period. The bell holes of all dry joints may be backfilled following this test. All leaking joints shall be reconnected (or tightened as necessary) and retested and all pipe, valves and fittings and other materials found defective under this test shall be removed and replaced at the Contractor's expense.
 2. Exception: When the open trench or open bell holes necessary for a visual inspection and test of the joints present a hazard to safety and welfare, or in an emergency, and/or special case, the operation incident to trenching, pipe laying, backfilling and testing shall be so coordinated as to minimize the lineal footage of open trench and that portion of the system tested in accordance with this section.
 3. This portion or portions of the system shall be tested between valves or temporary plugs in sections of not more than 2,500 lineal feet.
- C. Pressure and Leakage Test:
 1. Test Restrictions and Certification:
 - a. Per "Contractor's Material and Test Certificate for Underground Piping" following this section.
 - b. Test pressure shall not vary by more than +/- 5 psi for the duration of the test.
 - c. Valves shall not be operated in either direction at differential pressure exceeding the rated valve working pressure. Use of a test pressure greater than the rated valve pressure can result in trapped test pressure between the gates of a double-disc gate valve. For tests at these pressures, the test setup should include provision, independent of the valve, to reduce the line pressure to the rated valve pressure on completion of the test. The valve can then be opened enough to equalize the trapped pressure with the line pressure, or fully opened if desired.
 - d. Test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

- D. Pressurization:
1. After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to the required hydrostatic pressure at the point of testing to provide the minimum required pressure at the high point in the test section. Each valved section of pipe shall be slowly filled with water, and the specified test pressure, based on the evaluation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Owner. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.
- E. Air Removal:
1. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied.
- F. Examination:
1. All fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until it is satisfactory to the Owner.
- G. Flushing: Per Test Certificate unless test section is a fire service line, then flushing shall be in accordance with NFPA 24.
- H. Leakage Defined
1. See Test Certificate.
- I. Allowable Leakage
1. See Test Certificate.
- J. When hydrants are in the test section, the test shall be made against closed hydrant valves.
- K. Acceptance of Installation:
1. Acceptance shall be determined on the basis of allowable leakage. If any test of laid pipe disclosed leakage greater than that specified in Paragraph "H" above, the contractor shall, at his own expense, locate and make approved repairs as necessary until the leakage is within the specified allowance.
 - a. All visible leaks are to be repaired, regardless of the amount of leakage.

3.13 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Flush and disinfect system in accordance with Section 33 13 00 -Disinfection of Water Distribution System.

3.14 SERVICE CONNECTIONS

- A. Provide all sleeves, caulk or other materials required to provide a watertight connection at buildings or though walls or foundations.

3.15 FIELD QUALITY CONTROL

- A. Field trench inspection and compaction testing shall be performed under provisions of Section 31 23 17 - Utility Trenching & Backfilling.
- B. Compaction testing will be performed in accordance with ANSI/ASTM D698 Standard Proctor. Field testing methods shall be as deemed appropriate by the Geotechnical Engineer.
- C. Installation and testing shall be inspected in accordance with Section 31 09 00 – Geotechnical Engineering, Inspections & Testing
- D. Disinfection testing shall be performed in accordance with Section 33 13 00 - Disinfection of Water Distribution System.
- E. All equipment shall be tested in operation to demonstrate compliance with the contract requirements.
- F. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

Contractor's Material and Test Certificate for Underground Piping

PROCEDURE

Upon completion of work, inspection, and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners, and contractor. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authority's requirements or local ordinances.

PROPERTY NAME		DATE
PROPERTY ADDRESS		
PLANS	ACCEPTED BY APPROVING AUTHORITIES (NAMES)	
	ADDRESS	
	INSTALLATION CONFORMS TO ACCEPTED PLANS <input type="checkbox"/> YES <input type="checkbox"/> NO EQUIPMENT USED IS APPROVED <input type="checkbox"/> YES <input type="checkbox"/> NO IF NO, STATE DEVIATIONS	
INSTRUCTIONS	HAS PERSON IN CHARGE OF FIRE EQUIPMENT BEEN INSTRUCTED AS TO LOCATION OF CONTROL VALVES AND CARE AND MAINTENANCE OF THIS NEW EQUIPMENT? IF NO, EXPLAIN <input type="checkbox"/> YES <input type="checkbox"/> NO	
	HAVE COPIES OF APPROPRIATE INSTRUCTION AND CARE AND MAINTENANCE CHARTS BEEN LEFT ON PREMISES? IF NO, EXPLAIN <input type="checkbox"/> YES <input type="checkbox"/> NO	
LOCATION	SUPPLIES BUILDINGS	
UNDERGROUND PIPES AND JOINTS	PIPE TYPES AND CLASS	TYPE JOINT
	PIPE CONFORMS TO _____ STANDARD <input type="checkbox"/> YES <input type="checkbox"/> NO FITTINGS CONFORM TO _____ STANDARD <input type="checkbox"/> YES <input type="checkbox"/> NO IF NO, EXPLAIN	
	JOINTS NEEDING ANCHORAGE CLAMPED, STRAPPED, OR BLOCKED IN ACCORDANCE WITH _____ STANDARD <input type="checkbox"/> YES <input type="checkbox"/> NO IF NO, EXPLAIN	
TEST DESCRIPTION	<u>FLUSHING:</u> Flow the required rate until water is clear as indicated by no collection of foreign material in burlap bags and outlets such as hydrants and blow-offs. Flush at flows not less than 390 GPM (1476 L/min) for 4-inch pipe, 880 GPM (3331 L/min) for 6-inch pipe, 1560 GPM (5905 L/min) for 8-inch pipe, 2440 GPM (9235 L/min) for 10-inch pipe, 3520 GPM (13323 L/min) for 12-inch pipe. When supply cannot produce stipulated flow rates, obtain maximum available. <u>HYDROSTATIC:</u> Hydrostatic tests shall be made at not less than 200 psi (13.8 bars) for two hours or 50 psi (3.4 bars) above static pressure in excess of 150 psi (10.3 bars) for two hours. <u>LEAKAGE:</u> New pipe laid with rubber gasketed joints shall, if the workmanship is satisfactory, have little or no leakage at the joints. The amount of leakage at the joints shall not exceed 2 qts. per hr (1.89 L/h) per 100 joints irrespective of pipe diameter. The leakage shall be distributed over all joints. If such leakage occurs at a few joints the installation shall be considered unsatisfactory and necessary repairs made. The amount of allowable leakage specified above may be increased by 1 fl oz per in. valve diameter per hr. (30 mL/25 mm/h) for each metal sealed valve isolating the test section. If dry barrel hydrants are tested with the main valve open, so the hydrants are under pressure, an additional 5 oz. per minute (150 mL/min) leakage is permitted for each hydrant.	

Figure 8-1 (b) Part 1.

FLUSHING TEST	NEW UNDERGROUND PIPING FLUSHED ACCORDING TO STANDARDS BY (COMPANY) IF NO, EXPLAIN		<input type="checkbox"/> YES <input type="checkbox"/> NO
	HOW FLUSHING FLOW WAS OBTAINED <input type="checkbox"/> PUBLIC WATER <input type="checkbox"/> TANK OR RESERVOIR <input type="checkbox"/> FIRE PUMP	THROUGH WHAT TYPE OPENING <input type="checkbox"/> HYDRANT BUTT <input type="checkbox"/> OPEN PIPE	
	LEAD-INS FLUSHED ACCORDING TO _____ STANDARD BY (COMPANY) IF NO, EXPLAIN		<input type="checkbox"/> YES <input type="checkbox"/> NO
	HOW FLUSHING FLOW WAS OBTAINED <input type="checkbox"/> PUBLIC WATER <input type="checkbox"/> TANK OR RESERVOIR <input type="checkbox"/> FIRE PUMP	THROUGH WHAT TYPE OPENING <input type="checkbox"/> Y.CONN TO FLANGE & SPIGOT <input type="checkbox"/> OPEN PIPE	
HYDROSTATIC TEST	ALL NEW UNDERGROUND PIPING HYDROSTATICALLY TESTED AT _____ PSI FOR _____ HOURS		JOINTS COVERED <input type="checkbox"/> YES <input type="checkbox"/> NO
LEAKAGE TEST	TOTAL AMOUNT OF LEAKAGE MEASURED _____ GALS _____ HOURS ALLOWABLE LEAKAGE GALS HOURS		
HYDRANTS	NUMBER INSTALLED	TYPE AND MAKE	ALL OPERATE SATISFACTORILY <input type="checkbox"/> YES <input type="checkbox"/> NO
	WATER CONTROL VALVE LEFT WIDE OPEN IF NO, STATE REASON		
HOSE THREADS OF FIRE DEPARTMENT CONNECTIONS AND HYDRANTS <input type="checkbox"/> YES <input type="checkbox"/> NO INTERCHANGEABLE WITH THOSE OF THE FIRE DEPARTMENT ANSWERING ALARM			
REMARKS	DATE LEFT IN SERVICE		
SIGNATURES	NAME OF INSTALLING CONTRACTOR		
	TESTS WITNESSED BY		
	FOR PROPERTY OWNER (SIGNED)	TITLE	DATE
FOR INSTALLING CONTRACTOR (SIGNED)	TITLE	DATE	
ADDITIONAL EXPLANATION AND NOTES			

Figure 8-1 (b) Part 2.

END OF SECTION

SECTION 33 13 00
DISINFECTION OF WATER DISTRIBUTION SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES (but is not necessarily limited to)

- A. Disinfection of all equipment, pipe lines, and all structures in the water project with which water comes in contact and/or which have been contaminated by the Contractor's operations shall be accomplished after completion of construction and immediately before the system or unit is placed in operation.
- B. Testing and reporting results.

1.2 RELATED SECTIONS

- A. Applicable sections of Division 01 – GENERAL CONDITIONS: Including but not limited to:
 - 1. Coordination of the Work,
 - 2. Submittals: Procedures for submittals,
 - 3. Quality Control or Testing Laboratory Services: Testing water samples. Field inspection and testing,
 - 4. Material & Equipment: Delivery, storage and handling, and
 - 5. Contract Closeout: Project Record Documents, Requirements.
- B. Section 33 11 16 – Water Mains and Services

1.3 REFERENCES

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

AMERICAN WATER WORKS ASSOCIATION (AWWA)

VIRGINIA DEPARTMENT OF HEALTH (VDH)

- A. VDH "Waterworks Regulations," latest edition, hereinafter Waterworks Regulations.
- B. ANSI/AWWA B300 – Standard for Hypochlorites.
- C. ANSI/AWWA B301 – Standard for Liquid Chlorine.
- D. ANSI/AWWA B302 – Standard for Ammonium Sulfate.
- E. ANSI/AWWA B303 – Standard for Sodium Chlorite.
- F. AWWA C651 – Standards for Disinfecting Water Mains.
- G. ANSI/AWWA C652 – Standards for Disinfecting Water Storage Facilities.

1.4 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of applicable of Division 01: Contract Closeout: Project Record Documents, Requirements.
- B. Disinfection report; record:
 - 1. Type and form of disinfectant used.
 - 2. Date and time of disinfectant injection start and time of completion.
 - 3. Test locations.
 - 4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
 - 5. Date and time of flushing start and completion.
 - 6. Disinfectant residual after flushing in ppm for each outlet tested.
- C. Bacteriological report; record:
 - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
 - 2. Time and date of water sample collection.
 - 3. Name of person collecting samples.
 - 4. Test locations.
 - 5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
 - 6. Coliform bacteria test results for each outlet tested.
 - 7. Certification that water conforms, or fails to conform, to bacterial standards of VDH Waterworks Regulations.
 - 8. Bacteriologist's signature and authority.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with AWWA C651.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS & DILUTION MEDIUM

- A. Disinfecting Agent: The disinfection agent shall be liquid chlorine ANSI/AWWA B301, or sodium hypochlorite solution ANSI/AWWA B303. Dry hypochlorite ANSI/AWWA B300, similar and equal to "HTH" may also be used as the disinfecting agent.
- B. Potable water.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Piping shall be cleaned immediately after placing and all open ends shall be adequately sealed to prevent entry of debris.
- B. Unless the Contractor adheres to AWWA C651 concerning pipe cleanliness and

- prevents contamination of pipe, fittings and valves during construction, disinfection will be difficult.
- C. All sediment and foreign matter including debris resulting from cutting, welding or fabrication shall be removed from entire water distribution system including water lines and hydrants, followed by thorough flushing with potable water at a minimum velocity of 2.5 ft/sec to remove any sediment which may have collected during operation with raw water. In cases where this velocity is not attainable or is ineffective, cleaning devices such as foam swabs or "pigs" will be considered.
 - D. Perform scheduling and disinfection activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 INSTALLATION

- A. Provide and attach required equipment to perform the work of this Section.
- B. Pressure Testing: After the valves and piping have been installed, they shall be subjected for one hour to a hydrostatic pressure test of 150 pounds per square inch at the points of reading when the system is put into operation. Any defective material shall be replaced by the Contractor with sound material.
- C. Disinfection: All water lines shall be disinfected prior to being placed in operation. Potable water shall be introduced into the pipe line at a constant flow rate. This water shall receive a chlorine dosage which will result in a chlorine concentration of 100 mg/L in a "slug" of the water. An approved hypochlorite solution injected by a metering pump or liquid chlorine injected by a solution-feed chlorinator and booster pump may be used. The chlorine shall be added long enough to ensure that all portions of the pipe are exposed to the 100 mg/L chlorine solution for at least 3 hours. The Chlorine residual shall be checked at regular intervals not to exceed 2000 feet to ensure that adequate residual is maintained. As the chlorinated water passes valves and other appurtenances, they shall be operated to ensure disinfection of these appurtenances.

After the required retention period, the heavily chlorinated water shall be flushed from the pipe line using potable water until chlorine measurements show a concentration no greater than that generally prevailing in the source system. Comply with AWWA C651 requirements for disposal of disinfecting water with high chlorine concentrations.

After flushing the waterlines, two series of bacteriological samples shall be taken 24 hours apart. Collect one set of samples at intervals of 1,200 ft. of waterline, plus one set at each end of the new line and at the end of each branch (minimum of three sets total). Sets of two consecutive biological samples, taken at least 24 hours apart, which show no contamination, will indicate acceptable disinfection and the water lines may be placed in service.

- D. Disinfect permanent system devices removed for system disinfection by exposing to a chlorine solution for a similar time period (method shall be approved in the field). Replace same devices, being sure not to contaminate in the process.

3.3 QUALITY CONTROL

- A. Submit under provisions of applicable section of Division 01: Quality Control or Testing Laboratory Services: Testing water samples. Field inspection and testing.
 - B. Test samples in accordance with AWWA C651.
 - C. Approval of Disinfection: The complete disinfection program and methods followed, especially if materially different from those specified, shall be in accordance with directives of VDH and all methods employed shall have the approval of VDH. Definite instructions as to the collection and shipment of samples shall be requested from VDH and shall be followed in all respects. Final approval of the bacterial samples shall be received from VDH prior to the time that water mains are placed in service and allowed to be used for distribution of potable water. The Contractor shall deliver copies of the approved test data for the Owner and the Engineer.
 - D. All references made above to VDH shall also apply to the local utility purveyor, as applicable.

END OF SECTION

SECTION 33 31 00
SITE SANITARY GRAVITY SEWER SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES (but is not limited to)

- A. Sanitary gravity sewerage piping, fittings and accessories, and bedding.
- B. Connection of building sanitary drainage system to municipal sewer.
- C. Cleanout access and manholes.
- D. Utility top elevation adjustment.
- E. Provide new and modify existing exterior sanitary gravity sewer piping and appurtenances. Provide each system complete and ready for operation. The exterior sanitary gravity sewer system includes equipment, materials, installation, and workmanship as specified herein from approximately five (5) feet outside building walls.

1.2 RELATED SECTIONS

- A. Applicable sections of Division 01 - GENERAL CONDITIONS: Including but not limited to:
 - 1. Coordination of the Work,
 - 2. Soil and aggregate testing, compaction testing, and inspection of bearing surfaces,
 - 3. Material delivery, storage and handling,
 - 4. Project Record Document Requirements, and
 - 5. Procedures for Submittals.
- B. Section 31 09 00 – Geotechnical Engineering, Inspection, & Testing: Underground Utility Quality Assurance.
- C. Section 31 22 13 – Rough Grading: Site subgrade contouring. General cutting, grading, filling and rough contouring the site. Geotechnical Engineer. Subsoil and aggregate materials. Classifications of Excavation. Unauthorized excavation defined. Excavation. Dewatering.
- D. Section 31 23 17 - Utility Trenching & Backfilling: Excavating for sewer system piping and structures. Inspection of bearing surfaces. Bedding & haunching. Trace Wire for Non-Metallic Piping. Initial backfill. Backfill over piping up to subgrade elevation. Warning & ID Tape. Protection of utility from disturbance and damage during backfill operation.

1.3 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Latest revision shall be assumed.

AMERICAN SOCIETY OF TESTING & MATERIALS (ASTM)

- B. ASTM C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
- C. ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
- D. ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- E. ASTM D3212 - Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- F. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe

UNI-BELL PLASTIC PIPE ASSOCIATION (UNI)

- G. UNI B5 - Installation of Polyvinyl Chloride (PVC) Sewer Pipe
- H. UNI B6 - Low Pressure Air Testing of Installed Sewer Pipe

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

- I. VDOT - Virginia Department of Transportation "Road & Bridge Standards & Specifications"

VIRGINIA DEPARTMENT OF HEALTH (VDH)

- J. VDH - Virginia Department of Health "Sewage Conveyance and Treatment (SCAT) Regulations."
- K. VDH - Virginia Department of Health "Sewage Handling and Disposal (SH&D) Regulations."
- L. VDH – Virginia Department of Health "Waterworks Regulations."

1.4 QUALITY ASSURANCE

- A. Qualifications of Installers: Use skilled and experienced workmen to ensure proper installation of the products specified herein. Workmen shall be thoroughly familiar with codes covering work of their trade and work to be performed under this contract. In the acceptance or rejection of installed Work, no allowance shall be made for the lack of experience on the part of the workmen.
- B. Comply with all standards specified in this Section.

1.5 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Product Data:
 - 1. Provide manufacturer's standard drawings or catalog cuts for pipe, pipe

- accessories, and fittings.
2. Provide manufacturer's drawings for metal work.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements. Certificates shall attest that tests set forth in each applicable referenced publication have been performed, whether specified in that publication to be mandatory or otherwise. Production control tests shall have been performed at the intervals or frequency specified in the referenced publication. Other tests shall have been performed within three years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project. Include:
1. Pipe and fittings, including factory applied linings,
 2. Pipe joint materials,
 3. Cast iron frames and covers,
 4. Precast concrete manhole sections.

1.6 DELIVERY, STORAGE, HANDLING, AND PROTECTION

- A. Delivery and Storage
1. Piping: Inspect materials delivered to the site for damage; store with minimum of handling, on site in enclosures or under protective covering and not directly on the ground. Store plastic piping, jointing materials and rubber gaskets out of direct sunlight. Keep inside of pipes and fittings free of dirt and debris.
 2. Metal Items: Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.
- B. Handling: Handle pipe, fittings, and other accessories in such a manner as to ensure delivery to the trench in sound undamaged condition. Take special care not to damage linings of pipe and fittings; if lining is damaged, make satisfactory repairs or replace. Carry, do not drag, pipe to the trench.
- C. Protection: Use all means necessary to protect materials of this Section before, during, and after installation and to protect installed work and materials of other trades.
- D. Damage: in the event of damage, immediately make all repairs and replacements necessary to the approval of and at no additional cost to the Owner or Engineer.

1.7 PROJECT RECORD DOCUMENTS

- A. Record location of pipe runs, connections, manholes, cleanouts, structure top elevations and all pipe invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities (active or abandoned).

1.8 REGULATORY REQUIREMENTS

- A. Conform to applicable code for materials and installation of the Work of this section. Conform to materials' manufacturer's installation recommendations. Code shall take precedence.
- B. The Contractor shall comply with the VDH Waterworks Regulations Section pertaining to separation of water and sanitary sewer. Comply also with VDOT Std. UB-1 where separation requirements cannot be maintained.

1.9 COORDINATION

- A. Verify that field measurements and elevations are as indicated.
- B. Coordinate the Work with earthwork, trenching, point of connection to building sanitary plumbing, and connection to municipal sanitary sewer.
- C. Assure that structure tops will be at proposed finish grade and slope and that pipe cover is as specified.

PART 2 PRODUCTS

2.1 SEWER PIPE MATERIALS

- A. Plastic Gravity Sewer Pipe & Fittings (10' max. bury): Conform to ASTM D3034, Type PSM, Poly-Vinyl Chloride (PVC) material, SDR-35; inside nominal diameter as indicated on Drawings. Examples meeting design criteria:
 1. National Pipe Company, PVC Sewer Pipe (SDR 35),
 2. Robintech, King's Joint PVC Sewer Main (SDR-35),
 3. Clow, Deflec-Tite PVC Sewer Pipe (SDR-35), or
 4. Approved equal.
- B. Joints: Bell and spigot type suitable for elastomeric gasket joints conforming to ASTM D3212.
- C. Gaskets: Conform to ASTM F477.

2.2 PIPE ACCESSORIES

- A. Joints of Dissimilar Pipe: Provide standard manufactured fitting specifically for the proposed connection by same manufacturer of either type pipe or provide mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.
- B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required and with gaskets conforming to ASTM F477.

2.3 MANHOLES

- A. Manholes indicated on Drawings shall be precast VDOT Std. MH-2 with nominal

shaft diameter of 4 feet unless otherwise indicated. Taper shape shall be as indicated on Drawings by symbol or description. No parging will be permitted on interior manhole walls.

- B. Manhole frames and covers shall conform to VDOT Std. MH-1 except as herein modified. The frame shall be drilled to permit using 3/4 inch diameter bolts to secure it to the structure. Three such bolts shall be used per frame at 120 degrees. The words "SANITARY SEWER" shall be cast into the cover so as to be plainly visible. Covers shall be solid with two (2) "pick holes" at opposing edges.
- C. Steps shall be per VDOT Std. ST-1 placed in line with vertical wall of eccentric tapers or as creates most desirable access in other situations. All structures in excess of 3'-6" depth shall be provided with steps.
- D. Shaping shall be per VDOT Std. IS-1. All structures shall be provided with shaping.
- E. Base Pad (Precast): VDOT Standard B-1.
- F. Base Pad (Cast-in-place): VDOT Std. B-2 footing.
- G. Resilient Pipe Sleeve: For pipes from 4" to 22" diameter, provide resilient connectors in the wall of the reinforced concrete base/riser made of rubber with stainless steel sleeves and clamps, all conforming to ASTM C-923 equal.
- H. Riser Joint Sealant: Provide flexible rubber gasket conforming to ASTM C443 to create permanently flexible watertight joints.
- I. Waterproofing: Provide a 2 component, low-modulus, chemically cured coal tar epoxy polyimide waterproofing vapor barrier to manhole exteriors. It shall be spray applicable cure to a durable, flexible consistency.
- J. Rim Adjustments: Provide pre-cast grade rings or install brick and mortar as necessary to level, raise or lower existing or new manhole frames and covers to meet finish grade. Adjustments of 8 inches or less in height shall not be considered for additional compensation.

2.4 CLEANOUTS

- A. Per detail(s) on Drawings.

2.5 BEDDING & BACKFILL MATERIALS

- A. See Section 31 23 17 - Utility Trenching & Backfilling for:
 1. Bedding & Haunching,
 2. Cover Bedding/Initial Backfill, and
 3. Backfill Materials.

2.6 UTILITY ADJUSTMENT

- A. Provide grade rings, brick and mortar, or extensions for existing or new structures such that tops meet proposed finish grades. Adjustments of 8 inches or less in height shall be made at no additional cost to the Owner.

2.7 CONCRETE MATERIALS

- A. Concrete Materials not otherwise described herein shall be as specified in Section 03 30 00 - Cast-In-Place Concrete.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that all prerequisite work has been completed. Verify location and elevation of points of connection. Notify Engineer of any discrepancies.
- B. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 GENERAL

- A. See Section 31 23 17 - Utility Trenching & Backfilling: Excavating for sewer system piping and structures. Inspection of bearing surfaces. Bedding & haunching. Trace Wire for Non-Metallic Piping. Initial backfill. Backfill over piping up to subgrade elevation. Warning & ID Tape. Protection of utility from disturbance and damage during backfill operation.

3.3 INSTALLATION - PIPE

- A. These General Requirements for installation of pipelines apply except where specific exception is made in the following paragraph entitled, "Special Requirements." "Also" shall mean in addition to the general requirements.
- B. Obtain required approvals before making connection to existing line. Conduct work so that there is minimum impact from any interruption of service on existing line.
- C. Inspect each pipe and fitting before and after installation; replace those found defective and remove from site. Ream pipe and tube ends and remove fins and burrs from pipe and fittings. Provide adequate means and methods for lowering sections of pipe and associated items into trenches. Do not drop or dump pipe, fittings, or any other sewer piping material. Before placing in position, clean pipe, fittings and accessories, removing scale and dirt, on inside and outside, before assembly and maintain in a clean condition.
- D. Install pipe, fittings, and accessories in accordance with ASTM D2321 (PVC) and manufacturer's instructions. Seal joints watertight.
- E. Route pipe in straight line. Lay non-pressure pipe with bell ends in the upgrade

- direction. Adjust spigots in bells to give a uniform space all around unless a curved section is indicated on Drawings.
- F. Cut pipe accurately to measurements established at the site and work into place without springing or forcing and making proper provision for expansion and contraction of piping without stressing pipe or joints. Replace pipe or fitting that does not allow sufficient space for proper installation of joint material with new pipe or fittings of proper dimensions. Blocking or wedging between bells and spigots will not be permitted.
 - G. Tolerance: Lay pipe to slope gradients indicated on Drawings; with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m). Provide batterboards not more than 25 feet apart in trenches for checking and ensuring that pipe invert elevations are as indicated. Laser beam method may be used in lieu of batterboards for the same purpose.
 - H. Ensure firm and uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where indicated and where necessary for fastening work into place. Keep trenches free of water. At the end of each days work, close open ends of pipe temporarily with plugs, wood blocks or bulkheads.
 - I. Install haunching to springline of pipe (compacted thickness) per Section 31 23 17 - Utility Trenching & Backfilling.
 - J. Conduct required testing of piping system.
 - K. Install trace wire continuous over top of non-metallic pipe and place cover bedding/initial backfill above springline of pipe per Section 31 23 17 - Utility Trenching & Backfilling.
 - L. Connect to building sanitary plumbing outlet and municipal sewer system, septic tank & drainfield, or on-site treatment, as applicable.

3.4 SPECIAL REQUIREMENTS

- A. PVC Plastic Piping: Also conform to the requirements of UNI B5 for laying and joining pipe and fittings. Make joints with the gaskets specified for joints with this piping and assemble in accordance with the requirements of UNI B5 for joint assembly. Make joints to other pipe materials in accordance with the recommendations of the plastic pipe manufacturer.

3.5 INSTALLATION - CLEANOUTS

- A. Location/spacing: As indicated on Drawings, at all angular changes of direction and at 60 feet O.C. maximum in gravity lines not between manholes.
- B. Establish location, top elevation and pipe inverts and install wye as indicated in pipe installation above.

- C. Set vertical piping (adjusted to make ferrule or cover at proper finish grade), backfill per Section 31 23 17 - Utility Trenching & Backfilling, then set cleanout ferrule.
- D. Level top surface of backfill, form for the concrete collar pad (coordinating with adjacent work as necessary), and cast-in-place.
- E. Traffic Bearing Only: Set adapter so that in the completed work the cleanout plug has 2 inches minimum to 6 inches maximum clearance beneath the cover but no deeper than flush with the concrete anchor pad. Fill from cleanout invert with VDOT Std. #26 coarse aggregate to beneath the concrete anchor pad. Wrap cleanout adapter with welder's cloth followed by aluminum flashing prior to placing concrete. See detail on Drawings for other dimensions. Mount cover frame on grout to slope and elevation of finished traffic surface. Anchor frame with 5/8" bolts to anchor pad.

3.6 MANHOLE CONSTRUCTION

- A. Construct base slab of cast-in-place concrete or use precast concrete base sections as indicated. Make inverts conforming with VDOT Std. IS-1 Shaping. For changes in direction of the sewer and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as the manhole size will permit. For cast-in-place concrete construction, key and bond walls to bottom slab. No parging will be permitted on interior manhole walls. Make joints between precast manhole sections with the gaskets specified for this purpose; install in the manner specified for installing joints for precast concrete manholes. Make joints between concrete manholes and pipes entering manholes with the resilient connectors specified for this purpose; install in accordance with the recommendations of the connector manufacturer. Where a new manhole is constructed on an existing line, applicable local utilities standards shall take precedence over the above.
- B. Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blow holes that may impair their strength or appearance. Give exposed surfaces a smooth finish with sharp well-defined lines and rises. Provide necessary rabbets, lugs, and brackets wherever necessary for fitting and support.
- C. Apply waterproofing to exterior of structures, which have fully cured, to a minimum dry film thickness of 35 mils.

3.7 UTILITY ADJUSTMENTS

- A. Adjust new and existing structure tops affected by new work to meet proposed finish grades.
- B. Coordinate timing of adjustments to be prior to stone base applications for paved areas and prior to topsoil applications for lawn spaces.

3.8 FIELD QUALITY CONTROL

- A. The Engineer or other assigned Owner's representative will conduct field investigations and witness field tests specified in this section. The Contractor shall provide sufficient notice of tests for Owner's representative to be present (24 hours minimum). The Contractor shall perform field tests and provide labor, equipment, and incidentals required for testing, except that water and electric power needed for field tests will be furnished as set forth in applicable section of Division 1; Temporary Utilities. Be able to produce evidence, when required, that each item of work has been constructed in accordance with the Drawings and Specifications.
- B. Trench, Bedding and Compaction Tests: Per Section 31 23 17 - Utility Trenching & Backfilling.
- C. Tests for Non-Pressure Lines: Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the other end of the segment/run of pipe. When pressure piping is used in a non-pressure line for non-pressure use, test as specified for non-pressure line.
- D. Leakage Test: Test lines for leakage by low-pressure air tests. Prior to testing for leakage, place and compact haunching. When necessary to prevent pipeline movement during testing, place cover bedding/initial backfill around pipe sufficient to prevent movement, but leaving joints uncovered to permit inspection. When leakage or pressure drop exceeds the allowable amount specified, make satisfactory correction and retest pipeline section in the same manner. Correct visible leaks regardless of leakage test results.
- E. Low-Pressure Air Test for PVC Piping: Test in accordance with UNI B6, including the allowable pressure drop. Make calculations in accordance with the Appendix to UNI B6.
- F. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.9 SCHEDULE

- A. Sanitary Gravity Line: Indicated on the Drawings as "SS". Size: as indicated on Drawings and Profiles.
- B. Cleanout: As indicated on Drawings by "SSCO".

END OF SECTION

SECTION 33 41 00
SITE STORM DRAINAGE SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES (but is not limited to)

- A. Site storm drainage piping, fittings and accessories, and bedding.
- B. Drainage system from origin at inlets and/or connection to building rain leaders or downspouts to connection to municipal sewers or outfall, as applicable.
- C. Manholes, drop inlets (yard, sump or curb), detention basin structure(s).

1.2 RELATED SECTIONS

- A. Applicable sections of Division 01 - GENERAL CONDITIONS: Including but not limited to:
 - 1. Frequency of Tests,
 - 2. Coordination of the Work,
 - 3. Soil and aggregate testing, compaction testing, and inspection of bearing surfaces,
 - 4. Material delivery, storage and handling,
 - 5. Project Record Document Requirements, and
 - 6. Procedures for Submittals.
- B. Section 31 09 00 - Geotechnical Engineering, Inspection, & Testing: Underground Utility Quality Assurance.
- C. Section 31 05 13 - Soil Materials: Sub-soil materials.
- D. Section 31 05 16 - Aggregate Materials.
- E. Section 31 22 13 - Rough Grading: General cutting, grading, filling and rough contouring the site. Classification of Excavation. Unauthorized excavation defined.
- F. Section 31 25 13 - Erosion & Sediment Control.
- G. Section 31 23 23 - Backfilling.
- H. Section 31 23 17 - Utility Trenching & Backfilling: Excavating for sewer system piping and structures. Inspection of bearing surfaces. Backfilling over piping up to subgrade elevation.
- I. Section 33 46 00 - Subdrainage: Foundation, retaining wall and or slab-on-grade weep drainage system.

1.3 REFERENCES

VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

- A. VDOT "Road & Bridge Standards & Specifications", latest edition (hereinafter VDOT Std. ...).
- B. VDOT Memorandum LD-94(D)121.11 dated May 12, 1994 "Drainage Structure Criteria" - Polyethylene, Corrugated exterior, smooth interior (type S)

AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS (AASHTO)

- C. AASHTO M-198B - (flexible butyl resin sealant (ConSeal))

AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

- D. ASTM C14 - Concrete Sewer, Storm Drain, and Culvert Pipe.
- E. ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- F. ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets. (for use in structure risers)
- G. ASTM C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
- H. ASTM D698 (Standard Proctor) - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- I. ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- J. ASTM D2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- K. ASTM D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
- L. ASTM D3033 - Type PSP Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- M. ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- N. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- O. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- P. ASTM F405 - Polyethylene perforated drain pipe.

1.4 DEFINITIONS

- A. Bedding: Fill placed under pipe to provide support.
- B. Haunching: Fill placed from bedding to springline of the pipe, also considered bedding, which further supports pipe in both the horizontal and vertical.
- C. Cover Bedding/Initial Backfill: Fill placed above haunching to protect pipe prior to further backfill.

1.5 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- B. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.6 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of pipe runs, connections, drainage structures, structure top elevations and invert elevations for each pipe.
- B. Identify and describe unexpected variations in subsoil conditions or discovery of uncharted utilities.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for materials and installation of the Work of this section.

1.8 COORDINATION

- A. Coordinate the Work with termination of rain water leaders outside building, trenching, connection to foundation drainage system (as applicable), grading and erosion & sediment control/stabilization, and local governing authorities for work off-site.

PART 2 PRODUCTS

2.1 DRAINAGE PIPE MATERIALS

- A. Pipe materials have been indicated on the plans, profiles and Schedule at the end of this section. All storm drainage pipes 15" diameter or greater shall be constructed of Reinforced Concrete. If no material is specifically required, the Contractor shall have the option of choosing the following.
- B. Cast Iron Pipe (CIP) (max. 12" diameter): VDOT Spec. Section 232, Service type, inside nominal diameter as indicated on Drawings, bell and spigot end.
- C. Concrete Pipe (CP) (max. 12" diameter): VDOT Spec. Section 232.02 (a) 1. a.

- Plain concrete culvert pipe, non-reinforced; inside nominal diameter as indicated on Drawings, standard or modified tongue-and-groove joints.
- D. Reinforced Concrete Pipe (RCP): VDOT Spec. Section 232.02 (a) 1. b. Reinforced concrete culvert pipe, circular, Class III (for 14' max. cover and H-20 live load); mesh reinforcement; inside nominal diameter as indicated on Drawings, standard or modified tongue-and-groove joints.
 - E. Plastic Pipe (Poly-vinyl Chloride - PVC) (max. 12" diameter): VDOT Spec. Section 232.02 (g) 2. PVC Storm Drains; inside nominal diameter as indicated on Drawings.
 - F. Plastic Pipe (PE) (max. 12" diameter): VDOT Spec. Section 232.02 (j) 2. HDPE (high density poly-ethylene) corrugated storm drain and culvert pipe, type S (smooth interior wall); inside nominal diameter as indicated on Drawings. Pipe shall conform to AASHTO M-294. Corrugated interior pipe will not be allowed.
 - G. Plastic Pipe (PE) (only use in locations specifically indicated on the drawings): Perforated, corrugated, poly-ethylene (PE) pipe; inside nominal diameter as indicated on Drawings.
- ## 2.2 ACCESSORIES
- A. Joints of Dissimilar Pipe: Provide standard manufactured fitting specifically for the proposed connection by same manufacturer of either type pipe or stainless steel mechanical clamp contracting ring type, neoprene ribbed gasket for positive seal (Fernco type).
 - B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required flared end sections, tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
 - C. Filter Fabric: Per Section 31 25 13 - Erosion & Sediment Control, Silt Fence/Filter Fabric.
 - D. Filter Cloth: (Encourages drainage) Woven geotextile fabric Manufactured by LINQ, Model #GTF 200 S.
 - E. Geotextile Fabric: (Structural support) Non-woven geotextile fabric, Manufactured by LINQ Model #GTF 180 EX.
 - F. Trace Wire for Non-Metallic Piping: Comply with Section 31 23 17 - Utility Trenching & Backfilling.
 - G. Buried Utility Warning and Identification Tape: Comply with Section 31 23 17 - Utility Trenching & Backfilling.
 - H. Hydraulic Cement Mortar and Grout: VDOT Spec. Section 218. Mortar 218.03 (a). Grout 218 (c).

2.3 DRAINAGE STRUCTURES

- A. VDOT Standard or Modified VDOT Standard structures where indicated on the Drawings. Modified VDOT Standard structures shall conform to VDOT Standards for all work except structure shape or configuration modified per detail on Drawings. No parging will be permitted on interior walls.
- B. Manhole style access covers shall be labeled as "STORM SEWER".
- C. Nominal shaft diameter as required for proposed piping or as otherwise indicated on Drawings 48 inches minimum unless otherwise noted).
- D. Throat inlet lengths shall be as indicated on Drawings.
- E. Concrete manhole taper shape and orientation shall be as indicated by symbol on Drawings.
- F. Steps shall be per VDOT Std. ST-1 placed in line with vertical wall of eccentric tapers or as creates most desirable access in other situations. All structures over 3.5 feet deep, from top to invert out, shall be provided with steps.
- G. Flow channel shaping shall be per VDOT Std. IS-1. All structures shall be provided with shaping.
- H. Base Pad (Precast): As detailed in VDOT Standard B-1 for VDOT Std. structures, otherwise per detail on drawings.
- I. Base Pad (Cast-in-place): VDOT Std. B2 footing.
- J. Riser Joint Sealant: Provide flexible rubber compression gaskets to create permanently flexible watertight joints.

2.4 AREA DRAINS

- A. Refer to schedule and details on the Drawings for in-line drains and drain basins.

2.5 EXTERIOR MECHANICAL AREA FLOOR DRAINS

- A. Floor Drain: Coated cast iron construction, deep two-piece body with double drainage flange, non-puncturing flashing clamp collar, weepholes, bottom outlet, 12.625" dia. round bronze top-grate with 43.5 sq. in. free area minimum, removable deep sediment bucket which supports a medium-duty loose-set anti-silting grate with perimeter slots, size to match shaft construction below. JOSAM 32330 Series, SUPER-FLO 12-5/8" Top w/ Bucket (2" to 8" pipe outlet).
- B. Shaft Construction: Pipe type and size shall match horizontal run of pipe indicated on Drawings (minimum 4" to maximum 8" shaft). Bell end at top of shaft shall be adjusted to set finished grade of final product.

2.6 CLEANOUTS

- A. In Lawn Areas: (See detail on Drawings)
 - 1. Cleanout Ferrule: Cast iron construction, bronze countersunk threaded cleanout plug with recessed socket, size to match shaft construction below. JOSAM 58190-22 Series (2" to 8" pipe size).
 - 2. Shaft Construction: Pipe type and size shall match horizontal run of pipe indicated on Drawings (minimum 4" to maximum 8" shaft). Bell end at top of shaft shall be adjusted to set finished grade of final product.
 - 3. Base/Collar Pad: Cast-in-place VDOT Class A3 concrete.
- B. In Concrete Paved Areas (non-traffic bearing): (See detail on Drawings)
 - 1. Cleanout Ferrule: Cast iron construction, bronze countersunk threaded cleanout plug with recessed socket, 58190-22 Series as manufactured by Josam, size to match shaft construction below.
 - 2. Shaft Construction: Pipe type and size shall match horizontal run of pipe indicated on Drawings (minimum 4" to maximum 8" shaft). Bell end at top of shaft shall be adjusted to set finished grade of final product.
 - 3. Base/Collar Pad: Concrete pavement (sidewalk, etc.) shall act as collar. Scoring and finishing shall be that specified for the sidewalk. Do not strike or score dimensions of collar around cleanout unless the sidewalk scoring or jointing fall within that area. If so obtain Architects input on orientation of collar.
- C. In Paved Areas (traffic bearing): (See detail on Drawings)
 - 1. Cleanout Lid and Frame: Cast iron construction, hinged lid, #R-1976 manufactured by Neenah:
 - a. Lid Design: Checkerboard grill.
 - b. Nominal Lid and Frame Size: 11-1/4 inch dia. lid, 10 inch clear opening, 20 inch dia. flange, and 8 inch height.
 - 2. Base/Collar Pad: Cast-in-place VDOT Std. Class A3 concrete.

2.7 BEDDING AND BACKFILL MATERIALS

- A. Bedding & Haunching: See Section 31 23 17 - Utility Trenching & Backfilling. [Except dry-mix lean concrete shall be used for bedding (saddle) of pipe through detention basin berm.]
- B. Cover Bedding/Initial Backfill (Select Backfill): See Section 31 23 17 - Utility Trenching & Backfilling.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions.
- B. Verify that sizes, locations and elevations of any/all points of connection to existing or proposed work are as indicated on Drawings.
- C. Verify that trench cut is ready to receive work and excavations, dimensions, and

elevations are as indicated on Drawings.

3.2 PREPARATION

- A. Excavate pipe trench and correct over excavation in accordance with Section 31 23 17 - Utility Trenching & Backfilling for work of this section. See Drawings for trench detail.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated. Remove large stones or other hard matter, which could damage piping or impede consistent backfilling or compaction.

3.3 BEDDING

- A. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches (150 mm) compacted depth and compact to 95 percent. Continue until pipe springline is reached and hand excavate an accurate pipe shape to invert required. After setting pipe, where hand excavation is irregular against pipe, hand fill and tamp for an even fit tight to pipe at springline.
- B. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with VDOT Standards, applicable ASTM Standard for material and manufacturer's instructions, whichever is most stringent. Seal joints watertight.
- B. Lay pipe to slope gradients noted on Drawings with maximum variation from true slope of 1/8 inch (3 mm) in 10 feet (3 m). See Drawings for storm sewer profiles.
- C. Install aggregate at sides and over top of pipe. Provide top cover to minimum compacted thickness of 12 inches (300 mm), compact to 95 percent.
- D. Refer to Section 31 23 17 - Utility Trenching & Backfilling for backfilling requirements. Do not displace or damage pipe when compacting.
- E. Make connection to all storm water collectors and receiving channel or system to include, but are not necessarily limited to building rain leaders, downspouts, foundation drains, existing storm sewer to remain, etc.
- F. Install trace wire continuous over top of non-metallic pipe. Coordinate with Section 31 23 17 - Utility Trenching & Backfilling.
- G. Install Utility Warning and Identification Tape continuous over pipe. Coordinate with Section 31 23 17 - Utility Trenching & Backfilling. See Drawings for trench detail; ID tape location.

3.5 INSTALLATION - CLEANOUTS AND FLOOR DRAINS

- A. Establish elevations and pipe inverts as indicated in pipe installation above.
- B. Form bottom of excavation clean and smooth to correct elevation.
- C. Install wye per pipe installation above.
- D. Set vertical piping (adjusted to make ferrule or grate at proper finished grade), backfill per Section 31 23 17 - Utility Trenching & Backfilling, then set cleanout ferrule.
- E. Level top surface of backfill, form for the concrete collar pad (coordinating with adjacent work as necessary), and cast-in-place.
- F. Traffic Bearing Cleanout Only: Set adapter so that in the completed work the cleanout plug has 2 inches minimum to 6 inches maximum clearance beneath the lid but no deeper than flush with the concrete anchor pad. Fill from cleanout invert with VDOT Std. #26 coarse aggregate to beneath the concrete anchor pad. Wrap cleanout adapter with welder's cloth followed by aluminum flashing prior to placing concrete. See detail on drawings for other dimensions. Mount lid and frame on grout to slope and elevation of finished traffic surface. Anchor frame with 5/8" bolts to anchor pad.

3.6 INSTALLATION - DRAINAGE STRUCTURES

- A. Form bottom of excavation clean and smooth to correct subgrade elevation.
- B. Place and level a 4 inch (50 mm) base of Type A3 coarse aggregate.
- C. Set bottom riser section (doghouse or with precast base).
- D. Set pipe in and out of structure to line and grade.
- E. If not precast, form and place cast-in-place concrete base pad to pipe inverts per Drawings, providing for shaping.
- F. If precast, level top surface of base pad; sleeve concrete shaft sections to receive storm sewer pipe sections.
- G. Pipes shall be neatly and tightly mortared in place. Provide for required shaping.
- H. Set remaining risers and top segments to elevation indicated coordinating with adjacent work in line and grade.
- I. Mount manhole lid and frame in grout to elevation and slope of paved surface or level in lawn areas, secure top cone section to orientation (if eccentric) indicated.

3.7 FIELD QUALITY CONTROL

- A. Trench, Bedding & Backfilling Tests: Field trench inspection and compaction

testing will be performed under provisions of Section 31 22 13 – Rough Grading and Section 31 23 17 - Utility Trenching & Backfilling.

- B. The Architect or other assigned Owner's representative will conduct field investigations and witness field tests specified in this section. The Contractor shall perform field tests and provide labor, equipment, and incidentals required for testing, except that water and electric power needed for field tests will be furnished as set forth in Div. 1; Temporary Utilities. Be able to produce evidence, when required, that each item of work has been constructed in accordance with the Drawings and Specifications.
- C. Request inspection of installed piping prior to placing cover bedding/initial backfill over pipe. Place initial backfill and reinspect.
- D. Tests for Non-Pressure Lines: Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the other end of the segment/run of pipe. When pressure piping is used in a non-pressure line for non-pressure use, test as specified for non-pressure line.
- E. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

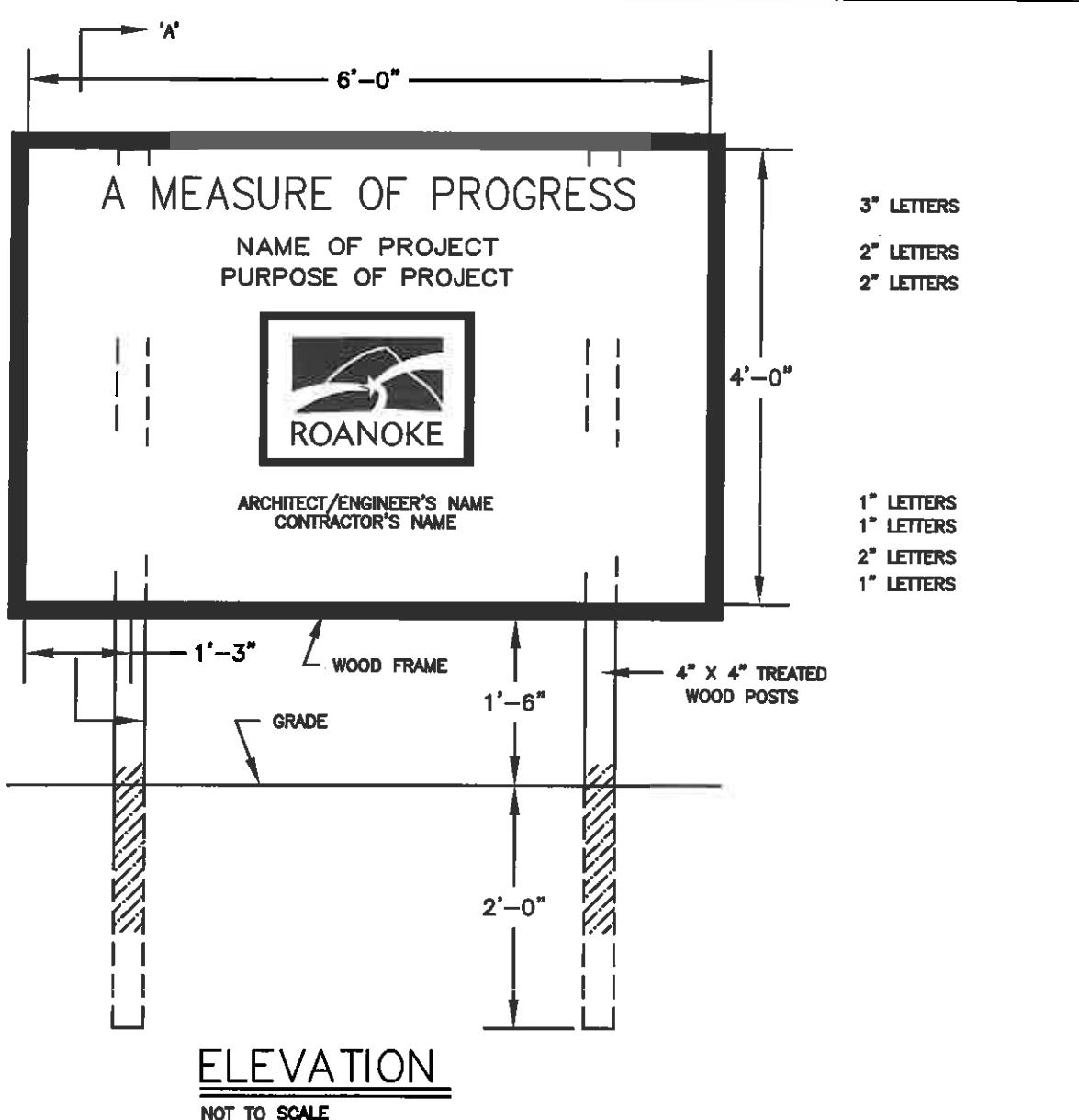
3.8 PROTECTION

- A. Protect finished Work under provisions of Section 31 10 00 - Site Preparation & Clearing.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

3.9 SCHEDULE

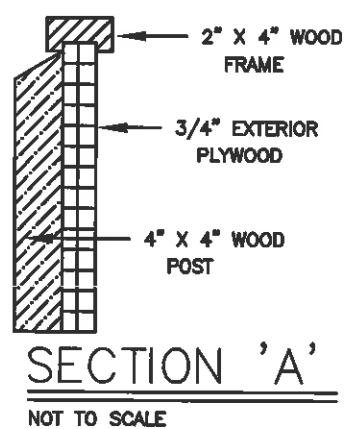
- A. Refer to Drawings (Profiles) for additional pipe and structure types and sizes.
- B. Storm Sewer Branch Lines: Connect inlets at various site locations with intersection of main sewer line. Size and type (RCP) as indicated on Drawings (profiles).
- C. Storm Sewer within VDOT Right-of-way and/or Easement: Size as indicated on Drawings (profiles). Material shall be RCP.
- D. Rain Leaders (RL): From 5 feet (1.5 m) beyond building wall, to municipal storm sewer; PVC; size as indicated on Drawings.

END OF SECTION



GENERAL NOTES:

- BACKGROUND PAINTED WHITE.
- FRAME, "ROANOKE" AND LOGO PAINTED PMS 7469U
- ALL LETTERING PAINTED PMS 7545U
- "OPTIMA" STYLE LETTERS



SHOP DRAWING TRANSMITTAL

Date:

Project No.:

Project Name:

To:

From:

Copy:

THE FOLLOWING SHOP DRAWING DATA IS BEING SENT TO YOU:

REMARKS:

SIGNED:

Request for Information (“RFI”)

To: Name From: Contractor
Spectrum Design, P.C. Address
10 Church Ave, SE, Plaza Suite 1 Phone
Roanoke, VA 24011 Fax
540.342.6001 Email
540.342.6055 (fax)
Email:

Project: Issue Date: RFI No.

Project Number: Requested Reply Date:

Copies To:

RFI Description: *(Fully describe the question or type of information requested.)*

References / Attachments: *(List specific documents researched when seeking the information requested.)*

Specifications: Drawings: Other:

Sender's Recommendation: *(If RFI concerns a site or construction condition, the sender may provide a recommended solution, including cost and/or schedule considerations.)*

Receiver's Reply: *(Provide answer to RFI, including cost and/or schedule considerations.)*

By

Date

Copies To:

Note: This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order, Construction Change Directive or a Minor Change in the work must be executed in accordance with the Contract Documents.

APPENDIX D

VDOT AGREEMENT DATED AUGUST 28, 2008, AND **VDOT DOCUMENTS REFERRED TO IN THE** **SUPPLEMENTAL GENERAL CONDITIONS**

1. VDOT Standard Project Agreement dated August 28, 2008, between VDOT and the City.
2. VDOT SF010CF-0309, FHWA 1273, Memorandum and CFR Change, dated May 1, 2012.
3. FHWA Memorandum, dated May 22, 2007. (2 pages).
4. VDOT SF030AF-0708 Special Provision for Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246), dated July 2008.
5. VDOT Form C-63 – DBE and SWAM Payment Compliance Report With Instructions, revised July 6, 2007. (4 pages).
6. VDOT Special Provision S107HF0-0708, Section 107.15, Use of Disadvantaged Business Enterprises (DBEs), dated December 10, 2010.
7. USDOT Order 1050.2 – Appendix A, dated November, 2008. (pages A-1 and A-2).
8. VDOT – General Decision: VA 20140124 and VA 20140128 (11 pages)
9. VDOT – SF001AF-0708, Predetermined Minimum Wage Rates, revised July, 2008. (1 page).
10. VDOT Form C-48, Subcontractor/Supplier Solicitation and Utilization Form (All Bidders), dated 2/23/11. (1 page). (Note - to be submitted within 10 calendar days after the opening of bids.)
11. VDOT Form C-49, DBE Good Faith Efforts Documentation, dated 2/24/14. (10 pages).
12. VDOT Form C-104, No Collusion Certification, revised 7/13/05. (1 page).
13. VDOT Form C-105, Affidavit, revised 7/13/05. (2 pages).
14. VDOT Form C-111, Minimum DBE Requirements, revised 2/15/11. (1 page).
15. VDOT Form C-112, Certification of Binding Agreement, revised 3/1/11. (2 pages). (Note- to be submitted within 2 days after bid opening.)
16. VDOT Special Provision S102CF1-0309, Use of Domestic Material, dated 7/26/13 (3 pages).
17. VDOT c103i01 E-Verify Work Authorization – Section 103 – Award and Execution of Contracts (8/8/14), VDOT c100lI2 VDOT SSs SPS SPCNs (Local Assist) (12/1/11), VDOT cu105000a Work Zone Traff Control Pers Req, VDOT c105hf1 Subcontracting (Fed funded) (12-19-08).

STANDARD PROJECT ADMINISTRATION AGREEMENT

Project Number	UPC	Local Designation
SRTS-128-296	87187	Roanoke City, Virginia

THIS AGREEMENT, made and executed in triplicate this 28th day of August, 2008, by and between the City of Roanoke, Virginia, hereinafter referred to as the LOCALITY and the Commonwealth of Virginia, Department of Transportation, hereinafter referred to as the DEPARTMENT.

WHEREAS, the LOCALITY has expressed its desire to administer the work described in Appendix A, and such work for each improvement shown is hereinafter referred to as a Project; and

WHEREAS, the funds shown in Appendix A have been allocated to finance each Project; and

WHEREAS, the LOCALITY will progress with the development of each Project so that any federal funds allocated to each Project may be obligated within three years of allocation to each Project in accordance with the current Statewide Transportation Improvement Program, unless otherwise specified in writing by the Department; and

WHEREAS, both parties have concurred in the LOCALITY's general administration of the phase(s) of work for the respective Project(s) listed in Appendix A in accordance with applicable federal, state, and local law and regulations.

NOW THEREFORE, in consideration of the mutual premises contained herein, the parties hereto agree as follows:

1. The LOCALITY shall:

- a. Be responsible for all activities necessary to complete the noted phase of each Project shown in Appendix A, except the performance of the State Environmental Review Process (SERP), and coordinate with the DEPARTMENT for all reviews, approvals, and environmental actions and decisions, as required. Each Project will be designed and constructed to meet or exceed current American Association of State Highway and Transportation Officials standards or supplementary standards approved by the DEPARTMENT.
- b. Receive prior written authorization from the DEPARTMENT to proceed with preliminary engineering, right-of-way acquisition and utility relocation, and construction phases of each Project.
- c. Maintain accurate and complete records of each Project's development and documentation of all expenditures and make such information available for inspection or auditing by the DEPARTMENT. Records and documentation for items for which reimbursement will be requested shall be maintained for no less than three (3) years following acceptance of the final voucher on each

Project, or all such records and documentation may be turned over to the DEPARTMENT in a manner acceptable to the DEPARTMENT.

- d. No more frequently than monthly, submit invoices with supporting documentation to the DEPARTMENT in the form prescribed by the DEPARTMENT. The supporting documentation shall include copies of related vendor invoices paid by the LOCALITY and a to-date project summary schedule tracking payment requests and adjustments. A request for reimbursement shall be made within 90 days after any eligible project expenses are incurred by the Locality. For federally funded projects and pursuant to the Federal Code of Regulation Title 49, Section 18.43, violations of the provision may result in the imposition of sanctions including possible denial or delay of payment of all or a part of the costs associated with the activity or action not in compliance.
 - e. Subject to appropriation, reimburse the DEPARTMENT all Project expenses incurred by the DEPARTMENT if, due to action or inaction solely by the LOCALITY, federally funded Project expenditures incurred are not reimbursed by the Federal Highway Administration (FHWA), or reimbursements are required to be returned to the FHWA, or in the event the reimbursement provisions of Section 33.1-44 or Section 33.1-70.01 of the Code of Virginia, 1950, as amended, or other applicable provisions of federal, state, or local law or regulations require such reimbursement.
 - f. On Projects that the LOCALITY is providing the required match to state or federal funds, pay the DEPARTMENT the LOCALITY's match for eligible Project expenses incurred by the DEPARTMENT in the performance of activities set forth in paragraph 2.a.
 - g. Administer the Project in accordance with all applicable federal, state, or local laws and regulations.
 - h. Provide certification by a LOCALITY official that all LOCALITY administered Project activities have been performed in accordance with all federal, state, or local laws and regulations. If the locality expends over \$500,000 annually in federal funding, such certification shall include a copy of the LOCALITY's single program audit in accordance with Office of Management and Budget Circular A-133.
 - i. The LOCALITY will use its staff counsel for all legal proceedings. If legal services other than that provided by staff counsel are required, the LOCALITY will consult the DEPARTMENT to obtain an attorney from the list of outside counsel approved by the Office of the Attorney General.
 - j. For Projects on facilities not maintained by the DEPARTMENT, provide, or have others provide, maintenance of the Project upon completion, unless otherwise agreed to by the DEPARTMENT.
2. The DEPARTMENT shall:

- a. Perform the SERP and provide guidance relative to the coordination of environmental commitments that result from the SERP, provide necessary coordination with the FHWA, and approve plans, specifications, advertisement documents, and contract awards as determined to be necessary by the DEPARTMENT.
 - b. Upon receipt of the LOCALITY's invoices pursuant to paragraph 1.d, reimburse the LOCALITY the cost of eligible Project expenses, as described in Appendix A. Such reimbursements shall be payable by the DEPARTMENT within 30 days of an acceptable submission by the LOCALITY.
 - c. If appropriate, submit invoices to the LOCALITY for the LOCALITY's share of eligible project expenses incurred by the DEPARTMENT in the performance of activities pursuant to paragraph 2.a.
 - d. Audit the LOCALITY's Project records and documentation as may be required to verify LOCALITY compliance with federal and state laws and regulations.
 - e. Make available to the LOCALITY guidelines to assist the parties in carrying out responsibilities under this Agreement.
3. Appendix A outlines the phases of work and general items to be administered by the LOCALITY. There may be additional elements that, once identified, shall be addressed by the parties hereto in writing, which may require an amendment to this Agreement.
 4. If designated by the DEPARTMENT, the LOCALITY is authorized to act as the DEPARTMENT's agent for the purpose of conducting survey work pursuant to Section 33.1-94 of the Code of Virginia, 1950, as amended.
 5. Nothing in this Agreement shall obligate the parties hereto to expend or provide any funds in excess of funds agreed upon in this Agreement or as shall have been appropriated. In the event the cost of a Project is anticipated to exceed the allocation shown for such respective Project on Appendix A, both parties agree to cooperate in providing additional funding for the Project or to terminate the Project before its costs exceed the allocated amount, however the DEPARTMENT and the LOCALITY shall not be obligated to provide additional funds beyond those appropriated and allocated.
 6. Nothing in this agreement shall be construed as a waiver of the LOCALITY's or the Commonwealth of Virginia's sovereign immunity.
 7. This agreement may be terminated by either party upon 30 days advance written notice. Eligible Project expenses incurred through the date of termination shall be reimbursed in accordance with paragraphs 1.e, 1.f, and 2.b, subject to the limitations established in this Agreement and Appendix A. Upon termination, the

DEPARTMENT shall retain ownership of plans, specifications, and right of way, unless all state and federal funds provided for the Project have been reimbursed to the DEPARTMENT by the LOCALITY, in which case the LOCALITY will have ownership of the plans, specifications, and right of way, unless otherwise mutually agreed upon in writing.

THE LOCALITY and DEPARTMENT acknowledge and agree that this Agreement has been prepared jointly by the parties and shall be construed simply and in accordance with its fair meaning and not strictly for or against any party.

THIS AGREEMENT, when properly executed, shall be binding upon both parties, their successors, and assigns.

THIS AGREEMENT may be modified in writing by mutual agreement of both parties.

IN WITNESS WHEREOF, each party hereto has caused this Agreement to be executed as of the day, month, and year first herein written.

CITY OF ROANOKE, VIRGINIA:

Darlene Burckham
Darlene Burckham

Typed or printed name of signatory

City Manager

Title

7/30/08

Date

Debra D. Lederman

Signature of Witness

07/30/08

Date

NOTE: The official signing for the LOCALITY must attach a certified copy of his or her authority to execute this agreement.

COMMONWEALTH OF VIRGINIA, DEPARTMENT OF TRANSPORTATION:

David J. Egan

Commonwealth Transportation Commissioner
Commonwealth of Virginia
Department of Transportation

08/28/2008

Date

Carolyn Gathes

Signature of Witness

APPROVED AS TO FORM

8/28/08

APPROVED AS TO EXECUTION

Attachments: Appendix A

By: John Doe 7/30/08
Assistant City Attorney

By: _____
Assistant City Attorney

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

- A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks; or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLetting OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project.

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**Certification Regarding Debarment, Suspension,
Ineligibility and Voluntary Exclusion--Lower Tier
Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**XI. CERTIFICATION REGARDING USE OF CONTRACT
FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

FHWA MEMORANDUM



**U.S. Department of
Transportation
Federal Highway
Administration**

MEMORANDUM

Subject: ACTION: The Discontinuance of the FHWA-45,
FHWA-47 & FHWA-810

Date: May 22, 2007

From: /s/ Original signed by
Dwight Horne,
Director Office of Program Administration

In Reply HIPA-10
Refer to:

To: Directors of Field Services
Division Administrators
Federal Lands Administrator

Effective immediately, Divisions and/or our State Transportation Agency (STA) partners will no longer be required to submit data to HIPA-10 that is collected as it relates to:

The FHWA-45, Bid Price Data¹,

The FHWA-47, Statement of Materials and Labor Used by Contractors on Highway Construction Involving Federal Funds², and

The FHWA-810, Bid Tabulation Data³

For several years, STAs have commented that the reports generated from the data collection efforts were of little utility and that there were statistical limitations, statistical significance, and accuracy issues with the data which were felt could result in misleading information. There was also a noted reporting burden on States and contractors. The suggestions have often been to eliminate the reporting requirements all together.

In 2003, the GAO conducted a review of the States' highway construction costs. As part of its review, the GAO reviewed FHWA's cost data collection requirements. In its discussions, the GAO also identified similar issues and concerns with the data series as discussed above. In a December 2003 report GAO made recommendations to FHWA to review the usefulness and accuracy and/or under reporting of the data collected.

As a result, FHWA has determined that it is appropriate to discontinue the reporting requirements for the FHWA 45, 47 and 810 as collection of this data for needed reports such as the "Highway Statistics" publication can be collected through other means. The main reasons for this decision are the strong disinterest in the data collection activities and comments provided to us by our STA partners suggesting that we are not collecting the data extensively enough to be of utility. We will also be going through an abridged regulatory update as appropriate to reflect this action.

Please contact Bob Wright, at 202-366-4630, to answer any questions and/or for additional information on this matter.

The FHWA 45, Bid Price Data, was collected on NHS projects over \$500,000. The FHWA 45 served as a means to compute the highway construction bid price index, which is published in the document "Price

Trends for Federal-aid Highway Construction. The data was used in our "Highway Statistics" publication and by other outside sources, including its use by congressional committees in their deliberations on pending new highway legislation.

The FHWA 47, Statement of Materials and Labor Used by Contractors on Highway Construction Involving Federal Funds, was collected on all NHS projects over \$1,000,000. The FHWA 47 served as a means to collect data related to the quantities of materials, supplies and labor used for various types of highway construction. The data reported on this form was used primarily to compute usage factors for these various materials, supplies, and labor. These factors were used to determine the economic impacts of cuts or increases in the cost of Federal-aid highway construction.

FHWA 810, Bid Tabulation Data was collected on all NHS projects. The needs for the FHWA 810 have been to compute national summaries on the largest contract awards and contract size statistics. The data was also used to produce state-by-state summaries on contracts awards, number of bids and average number of bids.

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE
EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals for female and minority participation, expressed in percentage terms of the Contractor's aggregate work force in each trade on all construction works in the covered area, are as follows:

Females- 6.9%
Minorities - See Attachment "A"

The goals are applicable to all the Contractor's construction work performed in the covered area, whether or not it is Federal or federally assisted. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications, set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established herein. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executives Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 workings days the award of any construction subcontract in excess of \$10,000 at any tier for construction works under this contract. The notification shall list the name, address and telephone number of the subcontractor, employer identification number, estimated dollar amount of the subcontract, estimated starting and completion dates of the subcontract and the geographical area in which the contract is to be performed.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)**

1. As, used in this provision:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U. S. Treasury Department Form 941;
 - d. "Minority" includes:

- (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation.
 3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors and Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
 4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the coverer area. Covered construction Contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
 5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
 6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.
 7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, shall assign two or more women to each construction project. The Contractor shall specifically ensure that all foreman, superintendents and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites in such facilities.
- b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
- c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off the street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union, or if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.
- d. Provide immediate written notification to the Director when the union or unions which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or women sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper or annual report; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents and General Foremen prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed and disposition of the subject matter.
- h. Disseminate the Contractor's EEO policy externally by including in any news media advertisement that the Contractor is "An Equal Opportunity Employer" for minority and female, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- i. Directs its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by

recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures and tests to be used in the selection process.

- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of Contractor's workforce.
- k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- l. Conduct, at least annually, an inventory and evaluation of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for such opportunities through appropriate training or other means.
- m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- n. Ensure that all facilities and company activities are nonsegregated, except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
9. Goals for women have been established. However, the Contractor IS required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner, that is even thought the Contractor has achieved its goals for women, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex or nation origin.
11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246. as amended.
13. The Contractor, in fulfilling its obligations under these specifications shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director will proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate and make known to the Department a responsible official as the EEO Officer to monitor all employment related activity, to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors will not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

ATTACHMENT A

<u>Economic Area</u>	<u>Goal (Percent)</u>
Virginia:	
021 Roanoke-Lynchburg, VA	
SMSA Counties:	
4640 Lynchburg, VA	19.3
VA Amherst; VA Appomattox; VA Campbell; VA Lynchburg	
6800 Roanoke, VA	10.2
VA Botetourt; VA Craig; VA Roanoke; VA Roanoke City; VA Salem	
Non-SMSA Counties	12.0
VA Alleghany; VA Augusta; VA Bath; VA Bedford; VA Bland; VA Carroll;	
VA Floyd; VA Franklin; VA Giles; VA Grayson; VA Henry; VA Highland;	
VA Montgomery; VA Nelson; VA Patrick; VA Pittsylvania; VA Pulaski;	
VA Rockbridge; VA Rockingham; VA Wythe; VA Bedford City; VA Buena	
Vista:	
VA Clifton Forge; VA Covington; VA Danville; VA Galax; VA Harrisonburg;	
VA Lexington; VA Martinsville; VA Radford; VA Staunton; VA Waynesboro;	
WV Pendleton.	
022 Richmond, VA	
SMSA Counties:	
6140 Petersburg - Colonial Heights - Hopewell, VA	30.6
VA Dinwiddie; VA Prince George; VA Colonial Heights; VA Hopewell;	
VA Petersburg.	
6760 Richmond, VA	24.9

VA Charles City; VA Chesterfield; VA Goochland, VA Hanover; VA Henrico; VA New Kent; VA Powhatan; VA Richmond.	
Non-SMSA Counties	27.9
VA Albemarle; VA Amelia; VA Brunswick; VA Buckingham, VA Caroline; VA Charlotte; VA Cumberland; VA Essex; VA Fluvanna; VA Greene; VA Greensville; VA Halifax; VA King and Queen; VA King William; VA Lancaster; VA Louisa; VA Lunenburg; VA Madison; VA Mecklenburg; VA Northumberland; VA Nottoway; VA Orange; VA Prince Edward; VA Richmond VA Sussex; VA Charlottesville; VA Emporia; VA South Boston	
023 Norfolk - Virginia Beach - Newport News VA:	
SMSA Counties:	
5680 Newport News- Hampton, VA	27.1
VA Gloucester; VA James City; VA York; VA Hampton; VA Newport News; VA Williamsburg.	
5720 Norfolk - Virginia Beach - Portsmouth, VA - NC	26.6
NC Currituck; VA Chesapeake; VA Norfolk; VA Portsmouth; VA Suffolk; VA Virginia Beach.	
Non-SMSA Counties	29.7
NC Bertie; NC Camden; NC Chowan; NC Gates; NC Hertford; NC Pasquotank; NC Perquimans; VA Isle of Wight; VA Matthews; VA Middlesex; VA Southampton; VA Surry; VA Franklin.	
Washington, DC:	
020 Washington, DC.	
SMSA Counties:	
8840 Washington, DC - MD - VA	28.0
DC District of Columbia; MD Charles; MD Montgomery MD Prince Georges; VA Arlington; VA Fairfax; VA Loudoun; VA Prince William VA Alexandria; VA Fairfax City; VA Falls Church.	
Non- SMSA Counties	25.2
MD Calvert; MD Frederick; MD St. Marys; MD Washington; VA Clarke; VA Culpeper; VA Fauquier; VA Frederick; VA King George; VA Page; VA Rappahannock; VA Shenandoah; VA Spotsylvania; VA Stafford; VA Warren; VA Westmoreland; VA Fredericksburg; VA Winchester WV Berkeley; WV Grant; WV Hampshire; WV Hardy; WV Jefferson; WV Morgan.	
Tennessee:	
052 Johnson City - Kingsport - Bristol, TN - VA	
SMSA Counties:	
3630 Johnson City - Kingsport -Bristol, TN-VA	2.6
TN Carter; TN Hawkins; TN Sullivan; TN Washington; VA Scott: VA Washington; VA Bristol.	
Non-SMSA Counties	3.2
TN Greene; TN Johnson; VA Buchanan; VA Dickenson; VA Lee; VA Russell; VA Smyth; VA Tazewell; VA Wise; VA Norton; WV McDowell; WV Mercer.	
Maryland:	
019 Baltimore MD	
Non-SMSA Counties	23.6
MD Caroline; MD Dorchester; MD Kent; MD Queen Annes; MD Somerset; MD Talbot; MD Wicomico; MD Worcester; VA Accomack; VA Northampton.	

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE AND SWAM PAYMENT COMPLIANCE REPORT**

(2a) Federally Funded
 (2b) State Funded
 (2c) Order No. _____
 (2e) Contractor/Subcontractor _____
 (2f) Route No. _____
 (2g) Project No. _____
 (2h) Contract Id. No. _____
 (2i) FHWA No. _____
 (2j) Date of Execution _____
 (2k) District _____

(2a) Federally Funded
 (2b) State Funded
 (2c) Order No. _____
 (2e) Contractor/Subcontractor _____
 (2f) Route No. _____
 (2g) Project No. _____
 (2h) Contract Id. No. _____
 (2i) FHWA No. _____
 (2j) Date of Execution _____
 (2k) District _____

(3) DBE and SWAM Firm Name, Certification No.	(4) Tax I.D. No.	(5) DBE and SWAM Category	(6) Allowable Credit of Contract or Agreement	(7) Allowable Credit		(8a) This Quarter	(8b) This Quarter	(8c) To Date	(8d) To Date	(8e) Disallowed (V/DOT Use Only)	(8f) Credit (V/DOT Use Only)	(9) Type of Work (Indicate Item Numbers & Work Description)
				(7a) This Quarter	(7b) To Date							
		DBE/MBE										
		DBE/MBE										
		DBE/MBE										
		DBE/MBE										
		DBE/MBE										
		DBE/MBE										
		DBE/MBE										
Total Dollar Amount Paid by Quarter and To Date by DBE and SWAM Category			DBME									
			DWBE									
			SBE									
			VBE									
			MBE									

All "amounts paid" to certified DBE and SWAM firms are to be reported and submitted by VDOT's quarterly submittal schedule. See Instructions.

I/WE certify under penalty of law that the information provided herein is accurate, current, and complete to the best of my/our knowledge.

Signature and Title of Company Official
Print Name and Phone Number of Individual Completing Report

Date _____

**VIRGINIA DEPARTMENT OF TRANSPORTATION
INSTRUCTIONS FOR
DBE/SWAM PAYMENT COMPLIANCE REPORT – C63**

The Prime Contractor is required to submit a DBE Payment Compliance Report and requested to submit payments made to Small, Women-owned, and Minority-owned (SWAM) Business Enterprises for the designated quarterly reporting period. All amounts paid to **certified** DBE and SWAM businesses are subject to monitoring and enforcement mechanisms. It is the responsibility of the prime contractor to provide evidence of DBE and SWAM payments in response to monitoring and enforcement compliance reviews.

The instructions below correspond to each item on the report. Please follow the instructions.

- 1a. **Report No.**
Indicate the number of the report you are sending in sequence. For example: If this is the second report you are submitting, enter Report No. 2.
- 1b. **Period Ending**
Indicate the reporting period based on the Reporting Schedule listed in these instructions.
- 2a. **Federally Funded**
Indicate if contract is federally funded.
- 2b. **State Funded**
Indicate if contract is state funded.
- 2c. **Order No.**
Enter the "Call Order" number assigned to your project by VDOT
- 2d. **Date of Execution**
Enter the date the contract was executed by VDOT.
- 2e. **Contractor/Subcontractor**
Enter your company's name.
- 2f. **Route No.**
Enter the highway route number shown in your contract.
- 2g. **Project No.**
Enter the project number assigned to your project by VDOT.
- 2h. **Contract Id. No.**
Enter the contract identification number assigned to your project by VDOT.
- 2i. **FHWA No.**
Enter the FHWA number assigned to your project.
- 2j. **District**
Enter the District where the project under contract is located.
3. **DBE and SWAM Firm Name, Certification No.**
Enter all DBE/SWAM subcontractors utilized and their certification number.

4. **Tax I.D. No.**
Indicate the Federal Employer Identification No.
5. **DBE and SWAM Category (As certified by the Virginia Department of Minority Business Enterprise)**
Designate type of DBE/SWAM business:
DBE: DMBE – Disadvantaged Minority-owned Business
DWBE – Disadvantaged Woman-owned Business

SWAM: SBE – Small Business
MBE – Minority-Owned Business
WBE – Woman-Owned Business
6. **Allowable Credit of Contract or Agreement**
Dollar value of contract or agreement to be performed by the DBE and SWAM during the contract or agreement which is allowable for participation credit.
- 7a. **Allowable Credit This Quarter**
Dollar amount that can be credited for work performed in reporting quarter.
- 7b. **Allowable Credit To Date**
Dollar amount that can be credited for work performed since work commenced.
- 8a. **Disallowed Credit This Quarter**
Dollar amount of payment paid to DBE and SWAM that is NOT allowable for participation credit in reporting quarter.
- 8b. **Disallowed Credit To Date**
Dollar amount of payment that is NOT allowable for participation credit since work commenced.
9. **Type of Work (Indicate Item Numbers)**
State work item(s) performed and give description.

Effective July 1, 2007, All Form C-63s for a particular reporting period shall be submitted in an electronic format to the respective person in responsible charge in each District by the following dates of each calendar year.

REPORTING SCHEDULE

Quarter	Reporting Period	Date Due To Responsible VDOT Residency
1st	July 1 – September 30	Five (5) working days after the reporting period
2nd	October 1 – December 31	Five (5) working days after the reporting period
3rd	January 1 – March 31	Five (5) working days after the reporting period
4th	April 1 – June 30	Five (5) working days after the reporting period

If the submittal date falls on a weekend/holiday, the forms shall be submitted to the VDOT Responsible Charge District Office on the following business day.

INSTRUCTIONS FOR SAVING FORM C-63 DATA IN PDF FORMAT

Please be advised that the information that you have placed on the Form C-63 (PDF format) will not save to the file when you close the file. **To save your information while using the PDF format, you must use the correct procedures outlined below.**

** The following steps will describe the correct procedure for saving the data that you have placed on the PDF version of the Form C-63:

- Step #1** CLICK ON "File"
- Step #2** CLICK ON "Save A Copy"
- Step #3** CLICK ON "Save A Blank Copy"
- Step #4** ENTER your "Firm Name" as the File Name
- Step #5** ENTER the "Order Number" (see line 2c on Form C-63)
- Step #6** ENTER Underscore (_)
- Step #7** ENTER "Report Number" (see line 1a on Form C-63)
- Step #8** ENTER "Quarter Ending" (see line 1b on Form C-63)
- Step #9** ENTER the "Year" (last two digits only)
- Step #10** ENTER ".pdf" as the appropriate file ending

EXAMPLE:

Firm Name:	Vdot Construction Co.
Order No.:	A01
Report No.:	5
Quarter Ending:	1st Quarter (Jul.1 – Sept. 30)
Year:	07

Using the information in the example, your file would be saved as:
vdotA01_050107.pdf

**VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
SECTION 107.15**

December 10, 2010

Section 107.15 of the Specifications is replaced by the following:

Section 107.15—Use of Disadvantaged Business Enterprises (DBEs)

A. Disadvantaged Business Enterprise (DBE) Program Requirements

Any Contractor, subcontractor, supplier, DBE firm, and contract surety involved in the performance of work on a federal-aid contract shall comply with the terms and conditions of the United States Department of Transportation (USDOT) DBE Program as the terms appear in Part 26 of the Code of Federal Regulations (49 CFR as amended), the USDOT DBE Program regulations; and the Virginia Department of Transportation's (VDOT or the Department) Road and Bridge Specifications and DBE Program rules and regulations.

For the purposes of this provision, Contractor is defined as the Prime Contractor of the contract; and sub-contractor is defined as any DBE supplier, manufacturer, or subcontractor performing work or furnishing material, supplies or services to the contract. The Contractor shall physically include this same contract provision in every supply or work/service subcontract that it makes or executes with a subcontractor having work for which it intends to claim credit.

In accordance with 49 CFR Part 26 and VDOT's DBE Program requirements, the Contractor, for itself and for its subcontractors and suppliers, whether certified DBE firms or not, shall commit to complying fully with the auditing, record keeping, confidentiality, cooperation, and anti-intimidation or retaliation provisions contained in those federal and state DBE Program regulations. By bidding on this contract, and by accepting and executing this contract, the Contractor agrees to assume these contractual obligations and to bind the Contractor's subcontractors contractually to the same at the Contractor's expense.

The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award, administration, and performance of this contract. Failure by the Contractor to carry out these requirements is a material breach of this contract, which will result in the termination of this contract or other such remedy, as VDOT deems appropriate.

All administrative remedies noted in this provision are automatic unless the Contractor exercises the right of appeal within the required timeframe(s) specified herein. Appeal requirements, processes, and procedures shall be in accordance with guidelines stated herein and current at the time of the proceedings. Where applicable, the Department will notify the Contractor of any changes to the appeal requirements, processes, and procedures after receiving notification of the Contractor's desire to appeal.

All time frames referenced in this provision are expressed in business days unless otherwise indicated. Should the expiration of any deadline fall on a weekend or holiday, such deadline will automatically be extended to the next normal business day.

B. DBE Certification

The only DBE firms eligible to perform work on a federal-aid contract for DBE contract goal credit are firms certified as Disadvantaged Business Enterprises by the Virginia Department of Minority Business Enterprise (DMBE) or the Metropolitan Washington Airports Authority (MWAA) in accordance with federal and VDOT guidelines. DBE firms must be certified in the specific work listed for DBE contract goal credit. A directory listing of certified DBE firms can be obtained from the Virginia Department of Minority Business Enterprise and the Metropolitan Washington Airports Authority Internet websites: <http://www.dmbc.virginia.gov/>; <http://mwaa.com/362.htm>

C. Bank Services

The Contractor and each subcontractor are encouraged to use the services of banks owned and controlled by socially and economically disadvantaged individuals. Such banking services and the fees charged for services typically will not be eligible for DBE Program contract goal credit. Such information is available from the VDOT's Internet Civil Rights Division website:
<http://insidevdot/C7/Civil%20Rights/default.aspx>

D. DBE Program-Related Certifications Made by Bidders\Contractors

By submitting a bid and by entering into any contract on the basis of that bid, the bidder/Contractor certifies to each of the following DBE Program-related conditions and assurances:

1. That the management and bidding officers of its firm agree to comply with the bidding and project construction and administration obligations of the USDOT DBE Program requirements and regulations of 49 CFR Part 26 as amended, and VDOT's Road and Bridge Specifications and DBE Program requirements and regulations.
2. Under penalty of perjury and other applicable penal law that it has complied with the DBE Program requirements in submitting the bid, and shall comply fully with these requirements in the bidding, award, and execution of the contract.
3. To ensure that DBE firms have been given full and fair opportunity to participate in the performance of the contract. The bidder certifies that all reasonable steps were, and will be, taken to ensure that DBE firms had, and will have, an opportunity to compete for and perform work on the contract. The bidder further certifies that the bidder shall not discriminate on the basis of race, color, age, national origin, or sex in the performance of the contract or in the award of any subcontract. Any agreement between a bidder and a DBE whereby the DBE promises not to provide quotations for performance of work to other bidders is prohibited.
4. As a bidder, good faith efforts were made to obtain DBE participation in the proposed contract at or above the goal for DBE participation established by VDOT. It has submitted as a part of its bid true, accurate, complete, and detailed documentation of the good faith efforts it performed to meet the contract goal for DBE participation. The bidder, by signing and submitting its bid, certifies the DBE participation information submitted within the stated time thereafter is true, correct, and complete, and that the information provided includes the names of all DBE firms that will participate in the contract, the specific line item(s) that each listed DBE firm will perform, and the creditable dollar amounts of the participation of each listed DBE. The specific line item must reference the VDOT line number and item number contained in the proposal.

5. The bidder further certifies, by signing its bid, it has committed to use each DBE firm listed for the specific work item shown to meet the contract goal for DBE participation. Award of the contract will be conditioned upon meeting these and other listed requirements of 49 CFR Part 26.53 and the contract documents. By signing the bid, the bidder certifies on work that it proposes to sublet; it has made good faith efforts to seek out and consider DBEs as potential subcontractors. The bidder shall contact DBEs to solicit their interest, capability, and prices in sufficient time to allow them to respond effectively, and shall retain on file proper documentation to substantiate its good faith efforts. Award of the contract will be conditioned upon meeting these and other listed requirements of 49 CFR Part 26.53 and the contract documents.
6. Once awarded the contract, the Contractor shall make good faith efforts to utilize DBE firms to perform work designated to be performed by DBEs at or above the amount or percentage of the dollar value specified in the bidding documents. Further, the Contractor understands it shall not unilaterally terminate, substitute for, or replace any DBE firm that was designated in the executed contract in whole or in part with another DBE, any non-DBE firm, or with the Contractor's own forces or those of an affiliate of the Contractor without the prior written consent of VDOT as set out within the requirements of this provision.
7. Once awarded the contract, the Contractor shall designate and make known to the Department a liaison officer who is assigned the responsibility of administering and promoting an active and inclusive DBE program as required by 49 CFR Part 26 for DBEs. The designation and identity of this officer need be submitted only once by the Contractor during any twelve (12) month period at the preconstruction conference for the first contract the Contractor has been awarded during that reporting period. The Department will post such information for informational and administrative purposes at VDOT's Internet Civil Rights Division website.
8. Once awarded the contract, the Contractor shall comply fully with all regulatory and contractual requirements of the USDOT DBE Program, and that each DBE firm participating in the contract shall fully perform the designated work items with the DBE's own forces and equipment under the DBE's direct supervision, control, and management. Where a contract exists and where the Contractor, DBE firm, or any other firm retained by the Contractor has failed to comply with federal or VDOT DBE Program regulations and/or their requirements on that contract, VDOT has the authority and discretion to determine the extent to which the DBE contract regulations and/or requirements have not been met, and will assess against the Contractor any remedies available at law or provided in the contract in the event of such a contract breach.
9. In the event a bond surety assumes the completion of work, if for any reason VDOT has terminated the prime Contractor, the surety shall be obligated to meet the same DBE contract terms and requirements as were required of the original prime Contractor in accordance with the requirements of this specification.

E. Disqualification of Bidder

Bidders may be disqualified from bidding for failure to comply with the requirements of this Special Provision, the contract specifications, and VDOT Road and Bridge Specifications.

F. Bidding Procedures

The following bidding procedures shall apply to the contract for DBE Program compliance purposes:

1. **Contract Goal, Good Faith Efforts Specified:** All bidders evidencing the attainment of DBE goal commitment equal to or greater than the required DBE goal established for the project must submit completed Form C-111, Minimum DBE Requirements, and Form C-48, Subcontractor/Supplier Solicitation and Utilization, as a part of the bid documents.

Form C-111 may be submitted electronically or may be faxed to the Department, but in no case shall the bidder's Form C-111 be received later than 10:00 a.m. the next business day after the time stated in the bid proposal for the receipt of bids. Form C-48 must be received within ten (10) business days after the bid opening.

If, at the time of submitting its bid, the bidder knowingly cannot meet or exceed the required DBE contract goal, it shall submit Form C-111 exhibiting the DBE participation it commits to attain as a part of its bid documents. The bidder shall then submit Form C-49, DBE Good Faith Efforts Documentation, within two (2) business days after the bid opening.

The lowest responsive and responsible bidder must submit its properly executed Form C-112, Certification of Binding Agreement, within three (3) business days after the bids are received. DBEs bidding as prime contractors are not required to submit Form C-112 unless they are utilizing other DBEs as subcontractors.

If, after review of the apparent lowest bid, VDOT determines the DBE requirements have not been met, the apparent lowest successful bidder must submit Form C-49, DBE Good Faith Efforts Documentation, which must be received by the Contract Engineer within two (2) business days after official notification of such failure to meet the aforementioned DBE requirements.

Forms C-48, C-49, C-111, and C-112 can be obtained from the VDOT website at:
<http://vdotforms.vdot.virginia.gov/>

Instructions for submitting Form C-111 can be obtained from the VDOT website at:
http://www.virginiadot.org/business/resources/const/Exp_DBE_Commitments.pdf

2. **Bid Rejection:** The failure of a bidder to submit the required documentation within the timeframes specified in the **Contract Goal, Good Faith Efforts Specified** section of this Special Provision may be cause for rejection of that bidder's bid.

If the lowest bidder is rejected for failure to submit the required documentation in the specified time frames, the Department may award the work to the next lowest bidder, or re-advertise the proposed work at a later date or proceed otherwise as determined by the Commonwealth.

3. **Good Faith Efforts Described:** In order to award a contract to a bidder that has failed to meet DBE contract goal requirements, VDOT will determine if the bidder's efforts were adequate good faith efforts, and if given all relevant circumstances, those efforts were made actively and aggressively to meet the DBE requirements. Efforts to obtain DBE participation are not good faith efforts if they could not reasonably be expected to produce a level of DBE participation sufficient to meet the DBE Program and contract goal requirements.

Good faith efforts may be determined through use of the following list of the types of actions the bidder may make to obtain DBE participation. This is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts of similar intent may be relevant in appropriate cases:

- (a) Soliciting through reasonable and available means, such as but not limited to, attendance at pre-bid meetings, advertising, and written notices to DBEs who have the capability to perform the work of the contract. Examples include: advertising in at least one daily/weekly/monthly newspaper of general circulation, as applicable; phone contact with a completely documented telephone log, including the date and time called, contact person, or voice mail status; and internet contacts with supporting documentation, including dates advertised. The bidder shall solicit this interest no less than five (5) business days before the bids are due so that the solicited DBEs have enough time to reasonably respond to the solicitation. The bidder shall determine with certainty if the DBEs are interested by taking reasonable steps to follow up initial solicitations as evidenced by documenting such efforts as requested on Form C-49, DBE Good Faith Efforts Documentation.
- (b) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to completely perform all portions of this work in its entirety or use its own forces;
- (c) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner, which will assist the DBEs in responding to a solicitation;
- (d) Negotiating for participation in good faith with interested DBEs;
 - 1. Evidence of such negotiation shall include the names, addresses, and telephone numbers of DBEs that were considered; dates DBEs were contacted; a description of the information provided regarding the plans, specifications, and requirements of the contract for the work selected for subcontracting; and, if insufficient DBE participation seems likely, evidence as to why additional agreements could not be reached for DBEs to perform the work;
 - 2. A bidder using good business judgment should consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and should take a firm's price, qualifications, and capabilities, as well as contract goals, into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not sufficient reason for a bidder's failure to meet the contract goal for DBE participation, as long as such costs are reasonable and comparable to costs customarily appropriate to the type of work under consideration. Also, the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make diligent good faith efforts. Bidders are not, however, required to accept higher quotes from DBEs if the price difference can be shown by the bidder to be excessive, unreasonable, or greater than would normally be expected by industry standards;
- (e) A bidder cannot reject a DBE as being unqualified without sound reasons based on a thorough investigation of the DBE's capabilities. The DBE's standing within its industry, membership in specific groups, organizations, associations, and political or social affiliations, and union vs. non-union employee status are not legitimate causes

for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal for DBE participation;

- (f) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by VDOT or by the bidder/Contractor;
- (g) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services subject to the restrictions contained in these provisions;
- (h) Effectively using the services of appropriate personnel from VDOT and from DMBE; available minority/women community or minority organizations; contractors' groups; local, state, and Federal minority/ women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and utilization of qualified DBEs.

G. Documentation and Administrative Reconsideration of Good Faith Efforts

During Bidding: As described in the **Contract Goal, Good Faith Efforts Specified** section of this Special Provision, the bidder must provide Form C-49, DBE Good Faith Efforts Documentation, of its efforts made to meet the DBE contract goal as proposed by VDOT within the time frame specified in this provision. The means of transmittal and the risk for timely receipt of this information shall be the responsibility of the bidder. The bidder shall attach additional pages to the certification, if necessary, in order to fully detail specific good faith efforts made to obtain the DBE firms participation in the proposed contract work.

However, regardless of the DBE contract goal participation level proposed by the bidder or the extent of good faith efforts shown, all bidders shall timely and separately file their completed and executed forms C-111, C-112, C-48, and C-49, as aforementioned, or face potential bid rejection.

If a bidder does not submit its completed and executed forms C-111, or C-112, when required by this Special Provision, the bidder's bid will be considered non-responsive and may be rejected.

Where the Department upon initial review of the bid results determines the apparent low bidder has failed or appears to have failed to meet the requirements of the **Contract Goal, Good Faith Efforts Specified** section of this Special Provision and has failed to adequately document that it made a good faith effort to achieve sufficient DBE participation as specified in the bid proposal, that firm upon notification of the Department's initial determination will be offered the opportunity for administrative reconsideration before VDOT rejects that bid as non-responsive. The bidder shall address such request for reconsideration in writing to the Contract Engineer within five (5) business days of receipt of notification by the Department and shall be given the opportunity to discuss the issue and present its evidence in person to the Administrative Reconsideration Panel. The Administrative Reconsideration Panel will be made up of VDOT Division Administrators or their designees, none of who took part in the initial determination that the bidder failed to make the goal or make adequate good faith efforts to do so. After reconsideration, VDOT shall notify the bidder in writing of its decision and explain the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so.

If, after reconsideration, the Department determines the bidder has failed to meet the requirements of the contract goal and has failed to make adequate good faith efforts to achieve the level of DBE participation as specified in the bid proposal, the bidder's bid will be rejected.

If sufficient documented evidence is presented to demonstrate that the apparent low bidder made reasonable good faith efforts, the Department will award the contract and reduce the DBE requirement to the actual commitment identified by the lowest successful bidder at the time of its bid. The Contractor is still encouraged to seek additional DBE participation during the life of the contract.

However, such action will not relieve the Contractor of its responsibility for complying with the reduced DBE requirement during the life of the contract or any administrative sanctions as may be appropriate.

During the Contract: If a DBE, through no fault of the Contractor, is unable or unwilling to fulfill his agreement with the Contractor, the Contractor shall immediately notify the Department and provide all relevant facts. If a Contractor relieves a DBE subcontractor of the responsibility to perform work under their subcontract, the Contractor is encouraged to take the appropriate steps to obtain a DBE to perform an equal dollar value of the remaining subcontracted work. In such instances, the Contractor is expected to seek DBE participation towards meeting the goal during the performance of the contract.

If the Contractor fails to conform to the schedule of DBE participation as shown on the progress schedule, or at any point at which it is clearly evident that the remaining dollar value of allowable credit for performing work is insufficient to obtain the scheduled participation, and the Contractor has not taken the preceding actions, the Contractor and any aforementioned affiliates may be subject to disallowance of DBE credit until such time as conformance with the schedule of DBE participation is achieved.

Project Completion: If the Contractor fails upon completion of the project to meet the required participation, the Contractor and any prime contractual affiliates, as in the case of a joint venture, may be enjoined from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects for a period of 90 days.

Prior to injunction from bidding or denial to participate as a subcontractor for failure to comply with participation requirements, as provided hereinbefore, the Contractor may submit documentation to the State Construction Engineer to substantiate that failure was due solely to quantitative underrun(s), elimination of items subcontracted to DBEs, or to circumstances beyond their control, and that all feasible means have been used to obtain the required participation. The State Construction Engineer upon verification of such documentation shall make a determination whether or not the Contractor has met the requirements of the contract.

If it is determined that the aforementioned documentation is insufficient or the failure to meet required participation is due to other reasons, the Contractor may request an appearance before the Administrative Reconsideration Panel to establish that all feasible means were used to meet such participation requirements. The decision of the Administrative Reconsideration Panel shall be administratively final. If the decision is made to enjoin the Contractor from bidding on other VDOT work as described herein, the injunction period will begin upon the Contractor's failure to request a hearing within the designated time frame or upon the Administrative Reconsideration Panel's decision to enjoin, as applicable.

H. DBE Participation for Contract Goal Credit

DBE participation on the contract will count toward meeting the DBE contract goal in accordance with the following criteria:

1. Cost-plus subcontracts will not be considered to be in accordance with normal industry practice and will not normally be allowed for credit.
2. The applicable percentage of the total dollar value of the contract or subcontract awarded to the DBE will be counted toward meeting the contract goal for DBE participation in accordance with the **DBE Program-Related Certifications Made by Bidders\Contractors** section of this Special Provision for the value of the work, goods, or services that are actually performed or provided by the DBE firm itself or subcontracted by the DBE to other DBE firms.
3. When a DBE performs work as a participant in a joint venture with a non-DBE firm, the Contractor may count toward the DBE goal only that portion of the total dollar value of the contract equal to the distinctly defined portion of the contract work that the DBE has performed with the DBE's own forces or in accordance with the provisions of this Section. The Department shall be contacted in advance regarding any joint venture involving both a DBE firm and a non-DBE firm to coordinate Department review and approval of the joint venture's organizational structure and proposed operation where the Contractor seeks to claim the DBE's credit toward the DBE contract goal.
4. When a DBE subcontracts part of the work of the contract to another firm, the value of that subcontracted work may be counted toward the DBE contract goal only if the DBE's subcontractor at a lower tier is a certified DBE. Work that a DBE subcontracts to either a non-DBE firm or to a non-certified DBE firm will not count toward the DBE contract goal. The cost of supplies and equipment a DBE subcontractor purchases or leases from the prime Contractor or the prime's affiliated firms will not count toward the contract goal for DBE participation.
5. The Contractor may count expenditures to a DBE subcontractor toward the DBE contract goal only if the DBE performs a Commercially Useful Function (CUF) on that contract.
6. A Contractor may not count the participation of a DBE subcontractor toward the Contractor's final compliance with the DBE contract goal obligations until the amount being counted has actually been paid to the DBE. A Contractor may count sixty (60) percent of its expenditures actually paid for materials and supplies obtained from a DBE certified as a regular dealer, and one hundred (100) percent of such expenditures actually paid for materials and supplies obtained from a certified DBE manufacturer.
 - (a) For the purposes of this Special Provision, a regular dealer is defined as a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles, or equipment required and used under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a regular dealer, the DBE firm shall be an established business that regularly engages, as its principal business and under its own name, in the purchase and sale or lease of the products or equipment in question. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions will not be considered regular dealers.
 - (b) A DBE firm may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business where it keeps such items in stock if the DBE both owns and operates distribution equipment for the products it sells and provides for the contract work.

Any supplementation of a regular dealer's own distribution equipment shall be by a long-term lease agreement and not on an *ad hoc* or contract-by-contract basis to be eligible for credit to meet the DBE contract goal.

- (c) If a DBE regular dealer is used for DBE contract goal credit, no additional credit will be given for hauling or delivery to the project site goods or materials sold by that DBE regular dealer. Those delivery costs shall be deemed included in the price charged for the goods or materials by the DBE regular dealer, who shall be responsible for their distribution.
- (d) For the purposes of this Special Provision, a manufacturer will be defined as a firm that operates or maintains a factory or establishment that produces on the premises the materials, supplies, articles, or equipment required under the contract and of the general character described by the project specifications. A manufacturer shall include firms that produce finished goods or products from raw or unfinished material, or purchase and substantially alter goods and materials to make them suitable for construction use before reselling them.
- (g) A Contractor may count toward the DBE contract goal the following expenditures to DBE firms that are not regular dealers or manufacturers for DBE program purposes:
 1. The entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical, consultant or managerial services, or for providing bonds or insurance specifically required for the performance of the federal-aid contract, if the fee is reasonable and not excessive or greater than would normally be expected by industry standards for the same or similar services.
 2. The entire amount of that portion of the construction contract that is performed by the DBE's own forces and equipment under the DBE's supervision. This includes the cost of supplies and materials ordered and paid for by the DBE for contract work, including supplies purchased or equipment leased by the DBE, except supplies and equipment a DBE subcontractor purchases or leases from the prime Contractor or its affiliates.
- (h) A Contractor may count toward the DBE contract goal one hundred (100) percent of the fees paid to a DBE trucker or hauler for the delivery of material and supplies required on the project job site, but not for the cost of those materials or supplies themselves, provided that the trucking or hauling fee is determined by VDOT to be reasonable, as compared with fees customarily charged by non-DBE firms for similar services. A Contractor shall not count costs for the removal or relocation of excess material from or on the job site when the DBE trucking company is not the manufacturer of or a regular dealer in those materials and supplies. The DBE trucking firm shall also perform a Commercially Useful Function (CUF) on the project and not operate merely as a pass through for the purposes of gaining credit toward the DBE contract goal. Prior to submitting a bid, the Contractor shall determine, or contact the VDOT Civil Rights Division or its district Offices for assistance in determining, whether a DBE trucking firm will meet the criteria for performing a CUF on the project. See section on **Miscellaneous DBE Program Requirements; Factors used to Determine if a DBE Trucking Firm is Performing a CUF**.
- (i) The Contractor will receive DBE contract goal credit for the fees or commissions charged by and paid to a DBE broker who arranges or expedites sales, leases, or other project work or service arrangements provided that those fees are determined by VDOT to be reasonable and not excessive as compared with fees customarily charged by non-DBE firms for similar services. For the purposes of this Special

Provision, a broker is defined as a person or firm that regularly engages in arranging for delivery of material, supplies, and equipment, or regularly arranges for the providing of project services as a course of routine business but does not own or operate the delivery equipment necessary to transport materials, supplies, or equipment to or from a job site.

I. Performing a Commercially Useful Function (CUF)

No credit toward the DBE contract goal will be allowed for contract payments or expenditures to a DBE firm if that DBE firm does not perform a CUF on that contract. A DBE performs a CUF when the DBE is solely responsible for execution of a distinct element of the contract work and the DBE actually performs, manages, and supervises the work involved with the firm's own forces or in accordance with the provisions of the **DBE Participation for Contract Goal Credit** section of this Special Provision. To perform a CUF the DBE alone shall be responsible and bear the risk for the material and supplies used on the contract, selecting a supplier or dealer from those available, negotiating price, determining quality and quantity, ordering the material and supplies, installing those materials with the DBE's own forces and equipment, and paying for those materials and supplies. The amount the DBE firm is to be paid under the contract shall be commensurate with the work the DBE actually performs and the DBE credit claimed for the DBE's performance.

Monitoring CUF Performance: It shall be the Contractor's responsibility to ensure that all DBE firms selected for subcontract work on the contract, for which he seeks to claim credit toward the contract goal, perform a CUF. Further, the Contractor is responsible for and shall ensure that each DBE firm fully performs the DBE's designated tasks with the DBE's own forces and equipment under the DBE's own direct supervision and management or in accordance with the provisions of the **DBE Participation for Contract Goal Credit** section of this Special Provision. For the purposes of this provision the DBE's equipment will mean either equipment directly owned by the DBE as evidenced by title, bill of sale or other such documentation, or leased by the DBE, and over which the DBE has control as evidenced by the leasing agreement from a firm not owned in whole or part by the prime Contractor or an affiliate of the Contractor under this contract.

VDOT will monitor the Contractor's DBE involvement during the performance of the contract. However, VDOT is under no obligation to warn the Contractor that a DBE's participation will not count toward the goal.

DBEs Must Perform a Useful and Necessary Role in Contract Completion: A DBE does not perform a commercially useful function if the DBE's role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.

DBEs Must Perform The Contract Work With Their Own Workforces: If a DBE does not perform and exercise responsibility for at least thirty (30) percent of the total cost of the DBE's contract with the DBE's own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, VDOT will presume that the DBE is not performing a CUF and such participation will not be counted toward the contract goal.

VDOT Makes Final Determination On Whether a CUF Is Performed: VDOT has the final authority to determine whether a DBE firm has performed a CUF on a federal-aid contract. To determine whether a DBE is performing or has performed a CUF, VDOT will evaluate the amount of work subcontracted by that DBE firm or performed by other firms and the extent of the involvement of other firms' forces and equipment. Any DBE work performed by the Contractor or by employees or equipment of the Contractor shall be subject to disallowance

under the DBE Program, unless the independent validity and need for such an arrangement and work is demonstrated.

J. Verification of DBE Participation and Imposed Damages

Within fourteen days after contract execution, the Contractor shall submit to the Responsible Engineer, with a copy to the District Civil Rights Office (DCRO), a fully executed subcontract agreement for each DBE used to claim credit in accordance with the requirements stated on Form C-112. The subcontract agreement shall be executed by both parties stating the work to be performed, the details or specifics concerning such work, and the price which will be paid to the DBE subcontractor. Because of the commercial damage that the Contractor and its DBE subcontractor could suffer if their subcontract pricing, terms, and conditions were known to competitors, the Department staff will treat subcontract agreements as proprietary Contractor trade secrets with regard to Freedom of Information Act requests. In lieu of subcontract agreements, purchase orders may be submitted for haulers, suppliers, and manufacturers. These too, will be treated confidentially and protected. Such purchase orders must contain, as a minimum, the following information: authorized signatures of both parties; description of the scope of work to include contract item numbers, quantities, and prices; and required federal contract provisions.

The Contractor shall also furnish, and shall require each subcontractor to furnish, information relative to all DBE involvement on the project for each quarter during the life of the contract in which participation occurs and verification is available. The information shall be indicated on Form C-63, DBE and SWAM Payment Compliance Report. The department reserves the right to request proof of payment via copies of cancelled checks with appropriate identifying notations. Failure to provide Form C-63 to the District Civil Rights Office (DCRO) within five (5) business days after the reporting period may result in delay of approval of the Contractor's monthly progress estimate for payment. The names and certification numbers of DBE firms provided by the Contractor on the various forms indicated in this Special Provision shall be exactly as shown on the DMBE's or MWAA's latest list of certified DBEs. Signatures on all forms indicated herein shall be those of authorized representatives of the Contractor as shown on the Prequalification Application, Form C-32 or the Prequalification/Certification Renewal Application, Form C-32A, or authorized by letter from the Contractor. If DBE firms are used which have not been previously documented with the Contractor's bid and for which the Contractor now desires to claim credit toward the project goal, the Contractor shall be responsible for submitting necessary documentation in accordance with the procedures stipulated in this Special Provision to cover such work prior to the DBE beginning work.

Form C-63 can be obtained from the VDOT website at: <http://vdotforms.vdot.virginia.gov/>

The Contractor shall submit to the Responsible Engineer its progress schedule with a copy to the DCRO, as required by Section 108.03 of the Specifications or other such specific contract scheduling specification that may include contractual milestones, i.e., monthly or VDOT requested updates. The Contractor shall include a narrative of applicable DBE activities relative to work activities of the Contractor's progress schedule, including the approximate start times and durations of all DBE participation to be claimed for credit that shall result in full achievement of the DBE goal required in the contract.

On contracts awarded on the basis of good faith efforts, narratives or other agreeable format of schedule information requirements and subsequent progress determination shall be based on the commitment information shown on the latest Form C-111 as compared with the appropriate Form C-63.

Prior to beginning any major component or quarter of the work, as applicable, in which DBE work is to be performed, the Contractor shall furnish a revised Form C-111 showing the name(s) and certification number(s) of any current DBEs not previously submitted who will

perform the work during that major component or quarter for which the Contractor seeks to claim credit toward the contract DBE goal. The Contractor shall obtain the prior approval of the Department for any assistance it may provide to the DBE beyond its existing resources in executing its commitment to the work in accordance with the requirements listed in the **Good Faith Efforts Described** section of this Special Provision. If the Contractor is aware of any assistance beyond a DBE's existing resources that the Contractor, or another subcontractor, may be contemplating or may deem necessary and that have not been previously approved, the Contractor shall submit a new or revised narrative statement for VDOT's approval prior to assistance being rendered.

If the Contractor fails to comply with correctly completing and submitting any of the required documentation requested by this provision within the specified time frames, the Department will withhold payment of the monthly progress estimate until such time as the required submissions are received VDOT. Where such failures to provide required submittals or documentation are repeated the Department will move to enjoin the Contractor and any prime contractual affiliates, as in the case of a joint venture, from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects until such submissions are received.

K. Documentation Required for Semi-final Payment

On those projects nearing completion, the Contractor must submit Form C-63 marked "Semi-Final" within twenty (20) days after the submission of the last regular monthly progress estimate to the DCRO. The form must include each DBE used on the contract work and the work performed by each DBE. The form shall include the actual dollar amount paid to each DBE for the accepted creditable work on the contract. The form shall be certified under penalty of perjury, or other applicable law, to be accurate and complete. VDOT will use this certification and other information available to determine applicable DBE credit allowed to date by VDOT and the extent to which the DBEs were fully paid for that work. The Contractor shall acknowledge by the act of filing the form that the information is supplied to obtain payment regarding a federal participation contract. A letter of certification, signed by both the prime Contractor and appropriate DBEs, will accompany the form, indicating the amount, including any retainage, if present, that remains to be paid to the DBE(s).

L. Documentation Required for Final Payment

On those projects that are complete, the Contractor shall submit a final Form C-63 marked "Final" to the DCRO, within thirty (30) days of the final estimate. The form must include each DBE used on the contract and the work performed by each DBE. The form shall include the actual dollar amount paid to each DBE for the creditable work on the contract. VDOT will use this form and other information available to determine if the Contractor and DBEs have satisfied the DBE contract goal percentage specified in the contract and the extent to which credit was allowed. The Contractor shall acknowledge by the act of signing and filing the form that the information is supplied to obtain payment regarding a federal participation contract.

M. Prompt Payment Requirements

The Contractor shall make prompt and full payment to the subcontractor(s) of any retainage held by the prime Contractor after the subcontractor's work is satisfactorily completed.

For purposes of this Special Provision, a subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished, documented, and accepted as required by the contract documents by VDOT. When VDOT has made partial acceptance of a portion of the prime contract, the Department will consider the work of any subcontractor covered by that partial acceptance to be satisfactorily completed. Payment will

be made in accordance with the requirements of Section 107.01, Section 109.08, and Section 109.09 of the Specifications.

Upon VDOT's payment of the subcontractor's portion of the work as shown on the monthly progress estimate and the receipt of payment by the Contractor for such work, the Contractor shall make compensation in full to the subcontractor for that portion of the work satisfactorily completed and accepted by the Department. For the purposes of this Special Provision, payment of the subcontractor's portion of the work shall mean the Contractor has issued payment in full, less agreed upon retainage, if any, to the subcontractor for that portion of the subcontractor's work that VDOT paid to the Contractor on the monthly progress estimate.

The Contractor shall make payment of the subcontractor's portion of the work within seven (7) days of the receipt of payment from VDOT in accordance with the requirements of Section 107.01, Section 109.08, and Section 109.09 of the Specifications.

If the Contractor fails to make payment for the subcontractor's portion of the work within the time frame specified herein, the subcontractor shall contact the Responsible Engineer and the Contractor's bonding company in writing. The bonding company and VDOT will investigate the cause for non-payment and, barring mitigating circumstances that would make the subcontractor ineligible for payment, ensure payment in accordance with the requirements of Section 107.01, Section 109.08, and Section 109.09 of the Specifications.

By bidding on this contract, and by accepting and executing this contract, the Contractor agrees to assume these contractual obligations, and to bind the Contractor's subcontractors contractually to those prompt payment requirements.

Nothing contained herein shall preclude the Contractor from withholding payment to the subcontractor in accordance with the terms of the subcontract in order to protect the Contractor from loss or cost of damage due to a breach of agreement by the subcontractor.

N. Miscellaneous DBE Program Requirements

Loss of DBE Eligibility: When a DBE firm has been removed from eligibility as a certified DBE firm, the following actions will be taken:

1. When a Bidder/Contractor has made a commitment to use a DBE firm that is not currently certified, thereby making the Contractor ineligible to receive DBE participation credit for work performed, and a subcontract has not been executed, the ineligible DBE firm does not count toward either the contract goal or overall goal. The Contractor shall meet the contract goal with a DBE firm that is eligible to receive DBE credit for work performed, or must demonstrate to the Contract Engineer that it has made good faith efforts to do so.
2. When a Bidder/Contractor has executed a subcontract with a certified DBE firm prior to official notification of the DBE firm's loss of eligibility, the Contractor may continue to use the firm on the contract and shall continue to receive DBE credit toward its DBE goal for the subcontractor's work.
3. When VDOT has executed a prime contract with a DBE firm that is certified at the time of contract execution but that is later ruled ineligible, the portion of the ineligible firm's performance on the contract before VDOT has issued the notice of its ineligibility shall count toward the contract goal.

Termination of DBE: If a certified DBE subcontractor is terminated, or fails, refuses, or is unable to complete the work on the contract for any reason, the Contractor must promptly

request approval to substitute or replace that firm in accordance with this section of this Special Provision.

The Contractor, as aforementioned in **DBE Program-Related Certifications Made by Bidders/Contractors**, shall notify VDOT in writing before terminating and/or replacing the DBE that was committed as a condition of contract award or that is otherwise being used or represented to fulfill DBE contract obligations during the contract performance period. Written consent from the Department for terminating the performance of any DBE shall be granted only when the Contractor can demonstrate that the DBE is unable, unwilling, or ineligible to perform its obligations for which the Contractor sought credit toward the contract DBE goal. Such written consent by the Department to terminate any DBE shall concurrently constitute written consent to substitute or replace the terminated DBE with another DBE. Consent to terminate a DBE shall not be based on the Contractor's ability to negotiate a more advantageous contract with another subcontractor whether that subcontractor is, or is not, a certified DBE.

1. All Contractor requests to terminate, substitute, or replace a certified DBE shall be in writing, and shall include the following information:
 - (a) The date the Contractor determined the DBE to be unwilling, unable, or ineligible to perform;
 - (b) The projected date that the Contractor shall require a substitution or replacement DBE to commence work if consent is granted to the request;
 - (c) A brief statement of facts describing and citing specific actions or inaction by the DBE giving rise to the Contractor's assertion that the DBE is unwilling, unable, or ineligible to perform;
 - (d) A brief statement of the affected DBE's capacity and ability to perform the work as determined by the Contractor;
 - (e) A brief statement of facts regarding actions taken by the Contractor which are believed to constitute good faith efforts toward enabling the DBE to perform;
 - (f) The current percentage of work completed on each bid item by the DBE;
 - (g) The total dollar amount currently paid per bid item for work performed by the DBE;
 - (h) The total dollar amount per bid item remaining to be paid to the DBE for work completed, but for which the DBE has not received payment, and with which the Contractor has no dispute;
 - (i) The total dollar amount per bid item remaining to be paid to the DBE for work completed, but for which the DBE has not received payment, and over which the Contractor and/or the DBE have a dispute.
2. Contractor's Written Notice to DBE of Pending Request to Terminate and Substitute with another DBE.

The Contractor shall send a copy of the "request to terminate and substitute" letter to the affected committed DBE firm, in conjunction with submitting the request to the DCRO. The affected DBE firm may submit a response letter to the Department within two (2) business days of receiving the notice to terminate from the Contractor. The affected DBE firm shall explain its position concerning performance on the committed work. The

Department will consider both the Contractor's request and the DBE's response and explanation before approving the Contractor's termination and substitution request, or determining if any action should be taken against the Contractor.

If, after making its best efforts to deliver a copy of the "request to terminate and substitute" letter, the Contractor is unsuccessful in notifying the affected DBE firm, the Department will verify that the affected, committed DBE firm is unable or unwilling to continue the contract. The Department will immediately approve the Contractor's request for a substitution.

3. Proposed Substitution of Another Certified DBE

Upon termination of a DBE, the Contractor shall use reasonable good faith efforts to replace the terminated DBE. The termination of such DBE shall not relieve the Contractor of its obligations pursuant to this section, and the unpaid portion of the terminated DBE's contract will not be counted toward the contract goal.

When a DBE substitution is necessary, the Contractor shall submit an amended Form C-111 with the name of another DBE firm, the proposed work to be performed by that firm, and the dollar amount of the work to replace the unfulfilled portion of the work of the originally committed DBE firm. The Contractor shall furnish all pertinent information including the contract I.D. number, project number, bid item, item description, bid unit and bid quantity, unit price, and total price. In addition, the Contractor shall submit documentation for the requested substitute DBE as described in this section of this Special Provision.

Should the Contractor be unable to commit the remaining required dollar value to the substitute DBE, the Contractor shall provide written evidence of good faith efforts made to obtain the substitute value requirement. The Department will review the quality, thoroughness, and intensity of those efforts. Efforts that are viewed by VDOT as merely superficial or pro-forma will not be considered good faith efforts to meet the contract goal for DBE participation. The Contractor must document the steps taken that demonstrated its good faith efforts to obtain participation as set forth in the **Good Faith Efforts Described** section of this Special Provision.

Factors Used to determine if a DBE Trucking Firm is performing a CUF:

The following factors will be used to determine whether a DBE trucking company is performing a CUF:

1. To perform a CUF the DBE trucking firm shall be completely responsible for the management and supervision of the entire trucking operation for which the DBE is responsible by subcontract on a particular contract. There shall not be a contrived arrangement, including, but not limited to, any arrangement that would not customarily and legally exist under regular construction project subcontracting practices for the purpose of meeting the DBE contract goal;
2. The DBE must own and operate at least one fully licensed, insured, and operational truck used in the performance of the contract work. This does not include a supervisor's pickup truck or a similar vehicle that is not suitable for and customarily used in hauling the necessary materials or supplies;
3. The DBE receives full contract goal credit for the total reasonable amount the DBE is paid for the transportation services provided on the contract using trucks the DBE owns, insures, and operates using drivers that the DBE employs and manages;

4. The DBE may lease trucks from another certified DBE firm, including from an owner-operator who is certified as a DBE. The DBE firm that leases trucks from another DBE will receive credit for the total fair market value actually paid for transportation services the lessee DBE firm provides on the contract;
5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE lessees, *not to exceed the value of transportation services provided by DBE-owned trucks on the contract*. For additional participation by non-DBE lessees, the DBE will only receive credit for the fee or commission it receives as a result of the lease arrangement.

EXAMPLE

DBE Firm X uses two (2) of its own trucks on a contract. The firm leases two (2) trucks from DBE Firm Y and six (6) trucks from non-DBE Firm Z.

Value of Trans. Serv.		
(For Illustrative Purposes Only)		
Firm X		
Truck 1	Owned by DBE	\$100 per day
Truck 2	Owned by DBE	\$100 per day
Firm Y		
Truck 1	Leased from DBE	\$110 per day
Truck 2	Leased from DBE	\$110 per day
Firm Z		
Truck 1	Leased from Non DBE	\$125 per day
Truck 2	Leased from Non DBE	\$125 per day
Truck 3	Leased from Non DBE	\$125 per day
Truck 4	Leased from Non DBE	\$125 per day
Truck 5	Leased from Non DBE*	\$125 per day
Truck 6	Leased from Non DBE*	\$125 per day

DBE credit would be awarded for the total transportation services provided by DBE Firm X and DBE Firm Y, and may also be awarded for the total value of transportation services by four (4) of the six (6) trucks provided by non-DBE Firm Z (*not to exceed the value of transportation services provided by DBE-owned trucks*).

Credit = 8 Trucks
Total Value of Transportation Services = \$820

In all, full DBE credit would be allowed for the participation of eight (8) trucks (twice the number of DBE trucks owned and leased) and the dollar value attributable to the Value of Transportation Services provided by the 8 trucks.

* With respect to the other two trucks provided by non-DBE Firm Z, DBE credit could be awarded only for the fees or commissions pertaining to those trucks that DBE Firm X receives as a result of the lease with non-DBE Firm Z.

6. For purposes of this section, the lease must indicate that the DBE firm leasing the truck has exclusive use of and control over the truck. This will not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, provided the lease gives the DBE absolute priority for and control over the use of the leased truck. Leased trucks must display the name and identification number of the DBE firm that has leased the truck at all times during the life of the lease.

Data Collection: In accordance with 49CFR Section 26.11, all firms bidding on prime contracts and bidding or quoting subcontracts on federal-aid projects shall provide the following information to the Contract Engineer annually.

- o Firm name
- o Firm address
- o Firm's status as a DBE or non-DBE
- o The age of the firm and
- o The annual gross receipts of the firm

The means of transmittal and the risk for timely receipt of this information shall be the responsibility of the bidder. However, the above information can be submitted by means of the Annual Gross Receipts Survey as required in the Prequalification/Certification application.

All bidders, including DBE prime Contractor bidders, shall complete and submit to the Contract Engineer the Subcontractor/Supplier Solicitation and Utilization Form C-48 for each bid submitted; to be received within ten (10) business days after the bid opening. Failure of bidders to submit this form in the time frame specified may be cause for disqualification of the bidder and rejection of their bid in accordance with the requirements of this Special Provision, the contract specifications, and VDOT Road and Bridge specifications.

O. Suspect Evidence of Criminal Behavior

Failure of a bidder, Contractor, or subcontractor to comply with the Virginia Department of Transportation Road and Bridge Specifications and these Special Provisions wherein there appears to be evidence of criminal conduct shall be referred to the Attorney General for the Commonwealth of Virginia and/or the FHWA Inspector General for criminal investigation and, if warranted, prosecution.

Suspected DBE Fraud

In appropriate cases, VDOT will bring to the attention of the U. S. Department of Transportation (USDOT) any appearance of false, fraudulent, or dishonest conduct in connection with the DBE program, so that USDOT can take the steps, e.g., referral to the Department of Justice for criminal prosecution, referral to the USDOT Inspector General, action under suspension and debarment or Program Fraud and Civil Penalties rules provided in 49CFR Part 31.

P. Summary of Remedies for Non-Compliance with DBE Program Requirements

Failure of any bidder\Contractor to comply with the requirements of this Special Provision for Section 107.15 of the Virginia Road and Bridge Specifications, which is deemed to be a condition of bidding, or where a contract exists, is deemed to constitute a breach of contract shall be remedied in accordance with the following:

1. Disadvantaged Business Enterprise (DBE) Program Requirements

The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award, administration, and performance of this contract. Failure by the Contractor to carry out these requirements is a material breach of this contract, which will result in the termination of this contract or other such remedy, as VDOT deems appropriate.

All administrative remedies noted in this provision are automatic unless the Contractor exercises the right of appeal within the required timeframe(s) specified herein.

2. DBE Program-Related Certifications Made by Bidders\Contractors

Once awarded the contract, the Contractor shall comply fully with all regulatory and contractual requirements of the USDOT DBE Program, and that each certified DBE firm participating in the contract shall fully perform the designated work items with the DBE's own forces and equipment under the DBE's direct supervision, control, and management. Where a contract exists and where the Contractor, DBE firm, or any other firm retained by the Contractor has failed to comply with federal or VDOT DBE Program regulations and/or their requirements on that contract, VDOT has the authority and discretion to determine the extent to which the DBE contract requirements have not been met, and will assess against the Contractor any remedies available at law or provided in the contract in the event of such a contract breach.

3. Disqualification of Bidder

Bidders may be disqualified from bidding for failure to comply with the requirements of this Special Provision, the contract specifications, and VDOT Road and Bridge Specifications.

4. Bidding Procedures

The failure of a bidder to submit the required documentation within the timeframes specified in the **Contract Goal, Good Faith Efforts Specified** section of this Special Provision may be cause for rejection of that bidder's bid. If the lowest bidder is rejected for failure to submit required documentation in the specified time frames, the Department may either award the work to the next lowest bidder, or re-advertise and construct the work under contract or otherwise as determined by the Commonwealth.

In order to award a contract to a bidder that has failed to meet DBE contract goal requirements, VDOT will determine if the bidder's efforts were adequate good faith efforts, and if given all relevant circumstances, those efforts were to the extent a bidder actively and aggressively seeking to meet the requirements would make. Regardless of the DBE contract goal participation level proposed by the bidder or the extent of good faith efforts shown, all bidders shall timely and separately file their completed and executed Forms C-111, C-112, C-48, and Form C-49, as aforementioned, or face potential bid rejection. If a bidder does not submit its completed and executed C-111, or C-112, when required by this Special Provision, the bidder's bid will be considered non-responsive and may be rejected. If, after reconsideration, the Department determines the bidder has failed to meet the requirements of the contract goal and has failed to make adequate good faith efforts to achieve the level of DBE participation as specified in the bid proposal, the bidder's bid will be rejected. If sufficient documented evidence is presented to demonstrate that the apparent low bidder made reasonable good faith efforts, the Department will award the contract and reduce the DBE requirement to the

actual commitment identified by the lowest successful bidder at the time of its bid. The Contractor is encouraged to seek additional participation during the life of the contract.

If the Contractor fails to conform to the schedule of DBE participation as shown on the progress schedule, or at any point at which it is clearly evident that the remaining dollar value of allowable credit for performing work is insufficient to obtain the scheduled participation, the Contractor and any aforementioned affiliates may be enjoined from bidding for 60 days or until such time as conformance with the schedule of DBE participation is achieved. In such instances, the Contractor is expected to seek DBE participation towards meeting the goal during the prosecution of the contract.

If the Contractor fails upon completion of the project to meet the required participation, the Contractor and any prime contractual affiliates, as in the case of a joint venture, may be enjoined from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects for a period of 90 days.

Prior to injunction from bidding or denial to participate as a subcontractor for failure to comply with participation requirements, as provided hereinbefore, the Contractor may submit documentation to the State Construction Engineer to substantiate that failure was due solely to quantitative underrun(s) or elimination of items subcontracted to DBEs, and that all feasible means have been used to obtain the required participation. The State Construction Engineer upon verification of such documentation shall make a determination whether or not the Contractor has met the requirements of the contract.

If it is determined that the aforementioned documentation is insufficient or the failure to meet required participation is due to other reasons, the Contractor may request an appearance before the Administrative Reconsideration Panel to establish that all feasible means were used to meet such participation requirements. The decision of the Administrative Reconsideration Panel shall be administratively final. The injunction period will begin upon the Contractor's failure to request a hearing within the designated time frame or upon the Administrative Reconsideration Panel's decision to enjoin, as applicable.

5. Verification of DBE Participation and Imposed Damages

If the Contractor fails to comply with correctly completing and submitting any of the required documentation requested by this provision within the specified time frames, the Department will withhold payment of the monthly progress estimate until such time as the required submissions are received by VDOT. Where such failures to provide required submittals or documentation are repeated the Department will move to enjoin the Contractor and any prime contractual affiliates, as in the case of a joint venture, from bidding as a prime Contractor, or participating as a subcontractor on VDOT projects until such submissions are received.

In addition to the remedies described heretofore in this provision VDOT also exercises its rights with respect to the following remedies:

Suspect Evidence of Criminal Behavior

Failure of a bidder, Contractor, or subcontractor to comply with the Virginia Department of Transportation Road and Bridge Specifications and these Special Provisions wherein there appears to be evidence of criminal conduct shall be referred to the Attorney General for the Commonwealth of Virginia and/or the FHWA Inspector General for criminal investigation and, if warranted prosecution.

In appropriate cases, VDOT will bring to the attention of the U. S. Department of Transportation (USDOT) any appearance of false, fraudulent, or dishonest conduct in connection with the DBE program, so that USDOT can take the steps, e.g., referral to the Department of Justice for criminal prosecution, referral to the USDOT Inspector General, action under suspension and debarment or Program Fraud and Civil Penalties rules provided in 49CFR Part 31.

USDOT Order 1050.2 - APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

(1) Compliance with Regulations: The contractor shall comply with the Regulation relative to nondiscrimination in federally-assisted programs of the Department of Transportation (hereinafter, "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

(2) Nondiscrimination: The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

(3) Solicitations for Subcontractors, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

(4) Information and Reports: The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the *(Recipient)* or the *(Name of Appropriate Administration)* to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information the contractor shall so certify to the *(Recipient)*, or the *(Name of Appropriate Administration)* as appropriate, and shall set forth what efforts it has made to obtain the information.

(5) Sanctions for Noncompliance: In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the *(Recipient)* shall impose such contract sanctions as it or the *(Name of Appropriate Administration)* may determine to be appropriate, including, but not limited to:

- (a.) withholding of payments to the contractor under the contract until the contractor complies, and/or
- (b.) cancellation, termination or suspension of the contract, in whole or in part.

(6) Incorporation of Provisions: The contractor shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto.

The contractor shall take such action with respect to any subcontract, or procurement as the *(Recipient)* or the *(Name of Appropriate Administration)* may direct as a means of enforcing such provisions including sanctions for non-compliance: Provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the *(Recipient)* to enter into such litigation to protect the interests of the *(Recipient)*, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

General Decision Number: VA150124 01/02/2015 VA124

Superseded General Decision Number: VA20140124

State: Virginia

Construction Type: Building

Counties: Craig, Giles, Pulaski and Radford* Counties in Virginia.

*INDEPENDENT CITY

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015

BOIL0045-004 10/01/2013

	Rates	Fringes
BOILERMAKER.....\$ 32.36		27.62

ELEC0026-035 06/01/2011

CRAIG & PULASKI COUNTIES

	Rates	Fringes
ELECTRICIAN.....\$ 21.89		8.53

ELEC0466-007 06/01/2013

GILES COUNTY

	Rates	Fringes
ELECTRICIAN.....\$ 21.63		12.10

* PLUM0010-018 09/01/2014

Rates	Fringes
-------	---------

PLUMBER.....	\$ 28.00	16.02
--------------	----------	-------

SHEE0100-036 07/01/2014

Rates	Fringes
-------	---------

SHEET METAL WORKER (Including HVAC Duct Installation)	
Inside Roanoke City and County.....\$ 21.02	17.19
Outside Roanoke City and County.....\$ 21.52	17.19

SUVA2010-136 09/20/2010

Rates	Fringes
-------	---------

ASBESTOS WORKER/HEAT & FROST	
INSULATOR.....\$ 23.29	10.09
BRICKLAYER.....\$ 22.74	5.65
CARPENTER (Drywall Hanging Only).....\$ 15.77	1.55
CARPENTER (Form Work Only).....\$ 11.00	1.10
CARPENTER, Excludes Drywall Hanging, and Form Work.....\$ 14.76	1.69
CEMENT MASON/CONCRETE FINISHER...\$ 14.89	0.00
IRONWORKER, ORNAMENTAL.....\$ 24.00	10.16
IRONWORKER, STRUCTURAL.....\$ 15.21	0.89
LABORER: Common or General.....\$ 10.67	1.40
LABORER: Landscape.....\$ 10.64	0.00
LABORER: Mason Tender - Brick...\$ 10.90	2.35
LABORER: Mason Tender - Cement/Concrete.....\$ 11.84	3.12
LABORER: Pipelayer.....\$ 14.44	2.35
OPERATOR: Backhoe.....\$ 15.70	2.35
OPERATOR: Bobcat/Skid Steer/Skid Loader.....\$ 15.62	2.40
OPERATOR: Bulldozer.....\$ 21.50	4.80
OPERATOR: Crane, All Types.....\$ 18.65	7.99
OPERATOR: Excavator.....\$ 14.58	2.47
OPERATOR: Forklift.....\$ 18.02	7.28

OPERATOR: Loader.....\$ 19.82	3.30
OPERATOR: Mechanic.....\$ 15.38	0.89
OPERATOR: Roller.....\$ 21.50	4.80
PAINTER: Brush and Roller.....\$ 17.34	5.59
PAINTER: Spray.....\$ 21.01	6.91
PIPEFITTER, Includes HVAC Pipe and Unit Installation.....\$ 21.60	10.24
ROOFER.....\$ 13.45	1.92
TILE FINISHER.....\$ 17.32	6.72
TILE SETTER.....\$ 21.12	7.68
TRUCK DRIVER: Dump Truck.....\$ 13.45	2.06

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1,

2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour

Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION



General Decision Number: VA150128 01/02/2015 VA128

Superseded General Decision Number: VA20140128

State: Virginia

Construction Type: Highway

Counties: Alleghany, Appomattox, Augusta, Bath, Bland, Buchanan, Buckingham, Buena Vista*, Carroll, Charlotte, Clifton Forge*, Covington*, Craig, Cumberland, Dickenson, Floyd, Franklin, Frederick, Galax*, Giles, Grayson, Halifax, Harrisonburg*, Henry, Highland, Lee, Lexington*, Martinsville*, Montgomery, Nelson, Norton*, Page, Patrick, Prince Edward, Pulaski, Radford*, Rockbridge, Rockingham, Russell, Salem*, Shenandoah, Smyth, South Boston*, Staunton*, Tazewell, Waynesboro*, Winchester*, Wise and Wythe Counties in Virginia.

*INDEPENDENT CITIES

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015

SUVA2013-001 09/20/2013

	Rates	Fringes
ASBESTOS WORKER.....	\$ 12.66	
CARPENTER (STRUCTURE)	\$ 18.21	
CEMENT MASON/CONCRETE FINISHER...\$	19.35	
ELECTRICIAN.....	\$ 17.05	
FORM SETTER.....	\$ 16.00	
IRONWORKER, REINFORCING.....\$	22.71	

IRONWORKER, STRUCTURAL.....\$ 24.00

LABORER

Asphalt Raker.....	\$ 14.51
Blaster.....	\$ 21.80
Construction Worker I (Skilled Laborer.....)	\$ 15.30
Construction Worker II (Laborer).....	\$ 12.37
Deckhand.....	\$ 13.70
Fence Erector.....	\$ 12.83
Flagger.....	\$ 11.45
Grade Checker.....	\$ 15.25
Guardrail Erector.....	\$ 13.18
Landscape Worker.....	\$ 12.27
Pipe Layer.....	\$ 16.75
Power Tool Operator.....	\$ 14.00
Sign Erector.....	\$ 15.27

PAINTER.....\$ 25.00

POWER EQUIPMENT OPERATOR:

Air Compressor.....	\$ 11.75
Asphalt Distributor.....	\$ 15.26
Asphalt Paver.....	\$ 16.02
Backhoe.....	\$ 17.79
Boom/Auger.....	\$ 29.00
Bulldozer (Utility).....	\$ 15.38
Bulldozer.....	\$ 19.36
Concrete Finish Machine Screed, Bridge.....	\$ 34.60
Concrete Finish Machine.....	\$ 34.60
Concrete Paving Machine.....	\$ 13.94
Concrete Pump.....	\$ 16.45
Concrete Saw.....	\$ 22.50
Crane, Derrick, Dragline.....	\$ 26.68
Crusher Tender.....	\$ 17.00
Drill Operator.....	\$ 20.00
Excavator (Gradall).....	\$ 20.53
Front End Loader.....	\$ 19.36
Hydro Seeder.....	\$ 16.64
Log Skidder.....	\$ 16.00
Mechanic.....	\$ 15.89
Mobile Mixer.....	\$ 10.45
Motor Grader (Fine Grade)....	\$ 26.13
Motor Grader (Rough Grade)...	\$ 20.64
Oiler, Greaser.....	\$ 19.23
Pavement Marking Operator...\$	15.44
Pavement Marking Truck Operator.....	\$ 18.00
Pavement Planing Groundman..\$	14.04
Pavement Planing Operator...\$	17.28
Pile Driver, Leadsman.....\$	21.70
Pile Driver.....	\$ 15.00
Pipe Boring/Jacking Machine Operator.....	\$ 11.00
Plant Operator.....	\$ 13.45
Roller (Finish).....	\$ 13.61
Roller (Rough).....	\$ 15.85
Scraper Pan.....	\$ 12.78

Shot Blast Machine.....\$ 14.94
Shovel Operator (2 yds and under).....\$ 10.41
Shovel Operator (over 2 yds).....\$ 11.50
Slip-Form Paver.....\$ 9.50
Slurry Seal Paver Machine Operator.....\$ 14.23
Slurry Seal Paver Truck Operator.....\$ 10.43
Stabilizer Operator.....\$ 9.55
Stone-Spreader.....\$ 13.54
Subgrade Machine Operator...\$ 11.50
Tractor Operator (Crawlers)...\$ 14.08
Tractor Operator (Utility)...\$ 12.25
Trenching Machine.....\$ 12.00
Vacuum Machine.....\$ 19.25

TRAFFIC SIGNALIZATION:

Traffic Signal Installation.....\$ 21.91
--

TRUCK DRIVER

Fuel and Lubricant Service
Truck Driver.....\$ 16.25
Transit Mix Truck Driver....\$ 12.25
Truck Driver (Single, Tandem & Multi Rear Axle)...\$ 15.19
Truck Driver, Heavy Duty (7 c.y. & under).....\$ 15.50
Truck Driver, Heavy Duty (over 7 c.y.).....\$ 16.69

WATERPROOFER.....\$ 13.16

WELDER.....\$ 15.76

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

□

PREDETERMINED MINIMUM WAGE RATES

**U.S. DEPARTMENT OF LABOR
OFFICE OF THE SECRETARY
WASHINGTON
DECISION OF THE SECRETARY**

This case is before the Department of Labor pursuant to a request for a wage predetermination as required by law applicable to the work described.

A study has been made of wage conditions in the locality and based on information available to the Department of Labor the wage rates and fringe payments listed are hereby determined by the Secretary of Labor as prevailing for the described classes for labor in accordance with applicable law.

This wage determination decision and any modifications thereof during the period prior to the stated expiration date shall be made a part of every contract for performance of the described work as provided by applicable law and regulations of the Secretary of Labor, and the wage rates and fringe payments contained in this decision, including modifications, shall be the minimums to be paid under any such contract and subcontractors on the work.

The contracting officer shall require that any class of laborers and mechanics which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination, and a report of the action taken shall be sent by the Federal agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the contracting officer shall be referred to the Secretary for determination.

Before using apprentices on the job the contractor shall present to the contracting officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U.S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U.S. Bureau of Apprenticeship and Training.

The contractor shall submit to the contracting officer written evidence of the established apprentice-j journeyman ratios and wage in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

Fringe payments include medical and hospital care, compensation for injuries or illness resulting from occupational activity, unemployment benefits, life insurance, disability and sickness insurance, accident insurance (all designated as health and welfare), pensions, vacation and holiday pay, apprenticeship or other similar programs and other bona fide fringe benefits.

By direction of the Secretary of Labor



E. Irving Manger, Associate Administrator
Division of Wage Determinations
Wage and Labor Standards Administration

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

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

FHWA NO. **DATE SUBMITTED**

All bidders, including DBEs bidding as Prime Contractors, shall complete and submit the following information as requested in this form within ten (10) business days after the opening of bids.

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

BIDDER _____ **SIGNATURE** _____

TITLE _____

SUBCONTRACTOR/SUPPLIER SOLICITATION AND UTILIZATION (ALL)

NOTE: ATTACH ADDITIONAL PAGES, IF NECESSARY.

BIDDER MUST SIGN EACH ADDITIONAL SHEET TO CERTIFY ITS CONTENT AND COMPLETION OF FORM

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

--DO NOT DETACH--

**THIS INFORMATION MUST BE SUBMITTED
WITHIN 2 DAYS AFTER BID OPENING IF YOUR
BID DOES NOT MEET THE PROJECT DBE
REQUIREMENTS, OR
WHEN REQUESTED BY VDOT**

CONTRACT I.D. NUMBER_____

PROJECT NUMBER_____

FHWA NUMBER_____

DISTRICT_____

DATE BID SUBMITTED_____

BIDDER'S NAME_____

SIGNATURE_____

TITLE_____

VENDOR NUMBER_____

DBE GOAL FROM BID PROPOSAL_____

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____

TITLE _____

NAMES OF CERTIFIED DBEs AND THE DATES ON WHICH THEY WERE SOLICITED TO BID ON THIS PROJECT

INCLUDE THE ITEMS OF WORK OFFERED AND THE DATES AND METHODS USED FOR FOLLOWING UP INITIAL SOLICITATIONS TO DETERMINE WHETHER OR NOT DBEs WERE INTERESTED.

NAMES AND VENDOR NUMBERS OF DBEs SOLICITED	DATE OF INITIAL SOLICITATION	ITEM(S) OF WORK	FOLLOW-UP METHODS AND DATES

NOTE: ATTACH ADDITIONAL PAGES IF NECESSARY

ATTACH COPIES OF SOLICITATIONS, TELEPHONE RECORDS, FAX CONFIRMATIONS, ELECTRONIC INFORMATION, ETC.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____

TITLE _____

TELEPHONE LOG

DBE(s) CALLED	TELEPHONE NUMBER	DATE CALLED	TIME CALLED	CONTACT PERSON OR VOICE MAIL STATUS

NOTE: ATTACH ADDITIONAL PAGES IF NECESSARY

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____

TITLE _____

ITEM(S) OF WORK THAT THE BIDDER MADE AVAILABLE TO DBE FIRMS

IDENTIFY THOSE ITEM(S) OF WORK THAT THE BIDDER MADE AVAILABLE TO DBE FIRMS OR THOSE ITEM(S) THE BIDDER IDENTIFIED AND DETERMINED TO SUBDIVIDE INTO ECONOMICALLY FEASIBLE UNITS TO FACILITATE DBE PARTICIPATION. FOR EACH ITEM LISTED, SHOW THE DOLLAR VALUE AND PERCENTAGE OF THE TOTAL CONTRACT AMOUNT. IT IS THE BIDDER'S RESPONSIBILITY TO DEMONSTRATE THAT SUFFICIENT WORK TO MEET THE GOAL WAS MADE AVAILABLE TO DBE FIRMS.

ITEM(S) OF WORK MADE AVAILABLE	BIDDER NORMALLY PERFORMS ITEM(S) (Y/N)	ITEM(S) BROKEN DOWN TO FACILITATE PARTICIPATION (Y/N)	AMOUNT IN DOLLARS	PERCENTAGE OF CONTRACT

NOTE: INFORMATION REQUIRED FOR THIS SECTION CONTINUED ON SHEET 5
ATTACH ADDITIONAL PAGES IF NECESSARY

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____
TITLE _____

ADDITIONAL INFORMATION REGARDING ITEM(S) OF WORK THAT THE BIDDER MADE AVAILABLE TO DBE FIRMS (Continued From Sheet 4)

ITEM(S) OF WORK MADE AVAILABLE, NAMES OF SELECTED FIRMS AND DBE STATUS, DBEs THAT PROVIDED QUOTES, PRICE QUOTE FOR EACH FIRM, AND THE PRICE DIFFERENCE FOR EACH DBE IF THE SELECTED FIRM IS NOT A DBE.

ITEM(S) OF WORK MADE AVAILABLE(CONT.)	NAME OF SELECTED FIRM AND VENDOR NUMBER	DBE OR NON-DBE	NAME OF REJECTED FIRM(S)	QUOTE IN DOLLARS	PRICE DIFFERENCE IN DOLLARS

NOTE: ATTACH ADDITIONAL PAGES IF NECESSARY.

IF THE FIRM SELECTED FOR THE ITEM IS NOT A DBE, PROVIDE THE REASON(S) FOR THE SELECTION ON A SEPARATE PAGE AND ATTACH.

PROVIDE NAMES, ADDRESSES, AND TELEPHONE NUMBERS FOR THE FIRMS LISTED ABOVE.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____

TITLE _____

ADVERTISEMENTS OR PROOFS OF PUBLICATION.

NAMES AND DATES OF EACH PUBLICATION IN WHCH A REQUEST FOR DBE PARTICIPATION FOR THE PROJECT WAS PLACED BY THE BIDDER. ATTACH COPIES OF PUBLISHED ADVERTISEMENTS OR PROOFS OF PUBLICATION.

PUBLICATIONS	DATES OF ADVERTISEMENT

NOTE: ATTACH ADDITIONAL PAGES IF NECESSARY

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____

TITLE _____

NAMES OF AGENCIES CONTACTED TO PROVIDE ASSISTANCE

NAMES OF AGENCIES (SEE SPECIAL PROVISION FOR 107.15) AND THE DATES THESE AGENCIES WERE CONTACTED TO PROVIDE ASSISTANCE IN CONTACTING, RECRUITING, AND USING DBE FIRMS. IF THE AGENCIES WERE CONTACTED IN WRITING, ATTACH COPIES OF SUPPORTING DOCUMENTS.

NAME OF AGENCY	METHOD AND DATE OF CONTACT	RESULTS

NOTE: ATTACH ADDITIONAL PAGES IF NECESSARY.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____

TITLE _____

TECHNICAL ASSISTANCE AND INFORMATION PROVIDED TO DBEs

EFFORTS MADE TO PROVIDE INTERESTED DBEs WITH ADEQUATE INFORMATION ABOUT THE PLANS, SPECIFICATIONS, AND REQUIREMENTS OF THE BID DOCUMENTS TO ASSIST THE DBEs IN RESPONDING TO A SOLICITATION.

IDENTIFY THE DBEs ASSISTED, THE INFORMATION PROVIDED, AND THE DATE OF CONTACT. ATTACH COPIES OF SUPPORTING DOCUMENTS.

DBEs ASSISTED	INFORMATION PROVIDED	DATE OF CONTACT

NOTE: ATTACH ADDITIONAL PAGES IF NECESSARY.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____
TITLE _____

**EFFORTS MADE TO ASSIST DBEs OBTAIN BONDING, LINES OF CREDIT,
INSURANCE, ETC.**

EFFORTS MADE TO PROVIDE INTERESTED DBEs IN OBTAINING BONDING, LINES OF CREDIT, INSURANCE, NECESSARY EQUIPMENT, SUPPLIES, MATERIALS, OR RELATED ASSISTANCE OR SERVICES, EXCLUDING SUPPLIES AND EQUIPMENT THE SUBCONTRACTOR PURCHASES OR LEASES FROM THE PRIME CONTRACTOR OR ITS AFFILIATES.

IDENTIFY THE DBEs ASSISTED, THE ASSISTANCE OFFERED, AND THE DATES OF SERVICES OFFERED AND PROVIDED. ATTACH COPIES OF SUPPORTING DOCUMENTS.

DBEs ASSISTED	ASSISTANCE OFFERED	DATES SERVICES OFFERED AND/OR PROVIDED

NOTE: ATTACH ADDITIONAL PAGES IF NECESSARY.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
DBE GOOD FAITH EFFORTS DOCUMENTATION

CONTRACT I.D. NO. _____ DATE SUBMITTED _____

IF THE DBE GOAL ESTABLISHED FOR THIS CONTRACT HAS NOT BEEN MET OR VDOT REQUESTS THE SUBMITTAL THEREOF, THE BIDDER IS REQUIRED TO SUBMIT GOOD FAITH EFFORTS AS OUTLINED IN THIS DOCUMENT.

THE BIDDER ACKNOWLEDGES AND CERTIFIES THAT THIS FORM ACCURATELY REPRESENTS THE INFORMATION CONTAINED HEREIN.

BIDDER _____ SIGNATURE _____

TITLE _____

ADDITIONAL DATA TO SUPPORT DEMONSTRATION OF GOOD FAITH EFFORTS

ADDITIONAL DATA TO SUPPORT DEMONSTRATION OF GOOD FAITH EFFORTS

NOTE: ATTACH ADDITIONAL PAGES, IF NECESSARY

ORDER NO.:
CONTRACT ID. NO.:

Form C-104
Rev. 7-13-05

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION

PROJECT:

FHWA:

This form must be completed, signed and returned with bid; and failure to do so may result in the rejection of your bid. **THE CONTRACTOR SHALL AFFIRM THE FOLLOWING STATEMENT EITHER BY SIGNING THE AFFIDAVIT AND HAVING IT NOTARIZED OR BY SIGNING THE UNSWORN DECLARATION UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES.** A SEPARATE FORM MUST BE SUBMITTED BY EACH PRINCIPAL OF A JOINT VENTURE BID.

STATEMENT. In preparation and submission of this bid, I, the firm, corporation or officers, agents or employees thereof did not, either directly or indirectly, enter into any combination or arrangement with any persons, firm or corporation or enter into any agreement, participate in any collusion, or otherwise take any action in the restraint of free, competitive bidding in violation of the Sherman Act (15 U.S.C. Section 1) or Article 1.1 or Chapter 12 of Title 18.2 (Virginia Governmental Frauds Act), Sections 59.1-9.1 through 59.1-9.17 or Sections 59.1-68.6 through 59.1-68.8 of the Code of Virginia.

AFFIDAVIT

The undersigned is duly authorized by the bidder to make the foregoing statement to be filed with bids submitted on behalf of the bidder for contracts to be let by the Commonwealth Transportation Board.

Signed at _____, this ____ day of _____, 20 ____
County (City), STATE _____

By: _____ (Signature) _____ Title (print) _____

STATE of _____ COUNTY (CITY) of _____

To-wit:

I _____, a Notary Public in and for the State and
County(City) aforesaid, hereby certify that this day _____
personally appeared before me and made oath that he is duly authorized to make the above statements
and that such statements are true and correct.

Subscribed and sworn to before me this _____ day of _____, 20 _____

My Commission expires _____

Notary Public

OR

UNSWORN DECLARATION

The undersigned is duly authorized by the bidder to make the foregoing statement to be filed with bids submitted on behalf of the bidder for contracts to be let by the Commonwealth Transportation Board.

Signed at _____, this ____ day of _____, 20 ____
County (City), STATE _____

By: _____ (Signature) _____ Title (print) _____

(Name of Firm)

(Signature)

ORDER NO.:
CONTRACT ID. NO.:

Form C-105
Rev. 7-13-05

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
AFFIDAVIT

PROJECT:

FHWA:

This form must be completed, signed, notarized and returned with bid; and failure to do so, may result in the rejection of your bid. A separate form must be submitted by each principal of a joint venture bid.

1. I, the firm, corporation or officers, agents or employees thereof have neither directly nor indirectly entered into any combination or arrangement with any person, firm or corporation or entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such contract, the effect of which is to prevent competition or increase the cost of construction or maintenance of roads or bridges.

During the preceding twelve months, I (we) have been a member of the following Highway Contractor's Associations, as defined in Section 33.1-336 of the Code of Virginia (1970). (If none, so state).

NAME

Location of Principal Office

2. I (we) have _____, have not _____, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, and that I/We have _____, have not _____, filed with the joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor [41 CFR 60-1.7(b)(1)], and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contract or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contract and subcontract unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

(Continued)

ORDER NO.:
CONTRACT ID. NO.:

Form C-105
page 2

3. The bidder certifies to the best of its knowledge and belief, that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offence in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated above; and
- (d) Where the bidders is unable to certify to any of the statements in this certification, the bidder shall show an explanation below.

Explanations will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any explanation noted, indicate below to whom it applies, initiating agency, and dates of action. Providing false information may result in federal criminal prosecution or administration sanctions. The bidder shall provide immediate written notice to the Department if at any time the bidder learns that its certification was erroneous when submitted or has become erroneous by reason of change circumstances.

The undersigned is duly authorized by the bidder to make the foregoing statements to be filed with bids submitted on behalf of the bidder for contracts to be let by the Commonwealth Transportation Board.

Signed at _____, this _____ day of _____, 20_____
County (City), STATE

(Name of Firm) _____ By: _____ Title (print) _____
STATE of _____ COUNTY (CITY) of _____
To-wit:
I _____, a Notary Public in and for the State and
County(City) aforesaid, hereby certify that this day _____
personally appeared before me and made oath that he is duly authorized to make the above statements
and that such statements are true and correct.
Subscribed and sworn to before me this _____ day of _____, 20_____
My Commission expires _____

Notary Public

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
MINIMUM DBE REQUIREMENTS**

PROJECT NO. _____

FHWA NO. _____

***** INSTRUCTIONS *****

THIS FORM CAN BE USED BY THE CONTRACTOR TO SUBMIT THE NAMES OF DBE FIRMS TO BE UTILIZED ON THE PROJECT. THE CONTRACTOR SHALL INDICATE THE DESCRIPTION OF THE CATEGORY (S, M, SP or H) AND THE TYPE OF WORK THAT EACH DBE WILL PERFORM AND THE ALLOWABLE CREDIT PER ITEM(S). ADDITIONAL SHEETS TO SHOW THE ALLOWABLE CREDIT PER ITEM MAY BE ATTACHED IF NECESSARY. **PLEASE NOTE:** THE AMOUNT OF ALLOWABLE CREDIT FOR A DBE SUPPLIER IS 60% OF THE TOTAL COST OF THE MATERIALS OR SUPPLIES OBTAINED AND 100% FOR A DBE MANUFACTURER OF THE MATERIALS AND SUPPLIES OBTAINED. A CONTRACTOR MAY COUNT 100% OF THE FEES PAID TO A DBE HAULER FOR THE DELIVERY OF MATERIALS AND SUPPLIES TO THE PROJECT SITE, BUT NOT FOR THE COST OF THE MATERIALS AND SUPPLIES THEMSELVES.

DBE REQUIREMENT

PERCENT ATTAINED BY BIDDER

NAME(S) AND CERTIFICATION NO. OF DBE(S) TO BE USED	USED AS SUBCONTR. (S) MFG. (M) SUPPLIER (SP) HAULER (H)	TYPE OF WORK AND ITEM NO(S)	\$ AMOUNT OF ALLOWABLE CREDIT PER ITEM
			TOTAL
			\$

TOTAL CONTRACT VALUE \$**X** **REQUIRED DBE** % = \$**6**

I/WE CERTIFY THAT THE PROPOSED DBE(S) SUBMITTED WILL BE USED ON THIS CONTRACT AS STATED HEREON AND ASSURE THAT DURING THE LIFE OF THE CONTRACT, I/WE WILL MEET OR EXCEED THE PARTICIPATION ESTABLISHED HEREON BY THE DEPARTMENT.

BIDDER

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
CERTIFICATION OF BINDING AGREEMENT
WITH
DISADVANTAGED BUSINESS ENTERPRISE FIRMS**

Project No.:

Federal Project No.:

This form is to be submitted in accordance with the Department's Special Provision for Section 107.15.

It is hereby certified by the below signed Contractors that there exists a written quote, acceptable to the parties involved preliminary to a binding subcontract agreement stating the details concerning the work to be performed and the price which will be paid for the aforementioned work. This document is not intended to, nor should it be construed to, contain the entire text of the agreement between the contracting parties. This document does not take the place of, nor may it be substituted for, an official subcontracting agreement in those situations that may require such an agreement. A copy of the fully executed *subcontract agreement* shall be submitted to the Engineer within fourteen (14) business days after contract execution.

It is further certified that the aforementioned mutually acceptable quote and fully executed subcontract agreement represent the entire agreement between the parties involved and that no conversations, verbal agreements, or other forms of non-written representations shall serve to add to, delete, or modify the terms as stated.

The prime Contractor further represents that the aforementioned mutually acceptable quote and fully executed subcontract agreement shall remain on file for a period of not less than one year following completion of the prime's contract with the Department or for such longer period as provisions of governing Federal or State law or regulations may require. For purposes of this form, the term Prime Contractor shall refer to any Contractor utilizing a DBE subcontractor, regardless of tier, in which they are claiming DBE credit toward the contract goal.

Contractors further jointly and severally represent that said binding agreement is for the performance of a "commercially useful function" as that term is employed in 49 C.F.R. Part 26.55 (c), (d).

**TO BE SIGNED BY THE SUBCONTRACTOR TO THE PRIME CONTRACTOR, AND ANY LOWER TIER
SUBCONTRACTORS HAVING A CONTRACT WITH THE BELOW NAMED DBE FIRM**

Prime Contractor _____

By: _____
Signature _____ Title _____
Date: _____

First Tier
Subcontractor if
Applicable _____

By: _____
Signature _____ Title _____
Date: _____

Second Tier
Subcontractor if
Applicable

By: _____
Signature _____ Title _____
Date: _____

Third Tier
Subcontractor if
Applicable

By: _____
Signature _____ Title _____
Date: _____

DBE Contractor

By: _____
Signature _____ Title _____
Date: _____

**VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
USE OF DOMESTIC MATERIAL**

July 26, 2013

SECTION 102.05 PREPARATION OF BID of the Specifications is amended to include the following:

In accordance with the provisions of Section 635.410(b) of Title 23 CFR, hereinafter referred to as "Buy America", except as otherwise specified, all iron and steel products (including miscellaneous steel items such as fasteners, nuts, bolts and washers) to be permanently incorporated for use on federal aid projects shall be produced in the United States of America regardless of the percentage they exist in the manufactured product or final form they take. Therefore, "Domestically produced in the United States of America" means all manufacturing processes must occur in the United States of America, to mean, in one of the 50 States, the District of Columbia, Puerto Rico or in the territories and possessions of the United States. Manufacturing processes are defined as any process which alters or modifies the chemical content, physical size or shape or final finish of iron or steel material) such as rolling, extruding, bending, machining, fabrication, grinding, drilling, finishing, or coating whereby a raw material or a reduced iron ore material is changed, altered or transformed into a steel or iron item or product which, because of the process, is different from the original material. For the purposes of satisfying this requirement "coating" is defined as the application of epoxy, galvanizing, painting or any other such process that protects or enhances the value of the material. Materials used in the coating process need not be domestic materials.

For the purposes herein the manufacturing process is considered complete when the resultant product is ready for use as an item in the project (e.g. fencing, posts, girders, pipe, manhole covers, etc.) or is incorporated as a component of a more complex product by means of further manufacturing. Final assembly of a product may occur outside of the United States of America provided no further manufacturing process takes place.

Raw materials such as iron ore, pig iron, processed, pelletized and reduced iron ore, waste products (including scrap, that is, steel or iron no longer useful in its present form from old automobiles, machinery, pipe, railroad rail, or the like and steel trimmings from mills or product manufacturing) and other raw materials used in the production of steel and/or iron products may, however, be imported. Extracting, handling, or crushing the raw materials which are inherent to the transporting the materials for later use in the manufacturing process are exempt from Buy America. The use of foreign source steel or iron billet is not acceptable under the provisions of Buy America. For the purposes of this provision all steel or iron material not meeting the criteria as domestically produced in the United States of America will be considered as "foreign" material. All iron and steel items will be classified hereinafter as "domestic" or "foreign", identified by and subject to the provisions herein.

Domestically produced iron or steel ingots or billets shipped outside the United States of America for any manufacturing process and returned for permanent use in a project would not comply with "Buy America" requirements.

Buy America provisions do not apply to iron or steel products used temporarily in the construction of a project such as temporary sheet piling, temporary bridges, steel scaffolding, falsework or such temporary material or product or material that remains in place for the Contractor's convenience.

Section 635.410(b) of Title 23 CFR permits a minimal amount of steel or iron material to be incorporated in the permanent work on a federal-aid contract. The cost of such materials or products must not exceed one-tenth of one percent of the contract amount or \$2500, whichever is greater. The cost of the foreign iron or steel material is defined as its monetary value delivered to the job site

and supported by invoices or bill of sale to the Contractor. This delivered to site cost must include transportation, assembly, installation and testing.

In the event the total cost of all "foreign" iron and steel product or material does not exceed one-tenth of one percent of the total contract cost or \$2,500, whichever is greater, the use of such material meeting the limitations herein will not be restricted by the domestic requirements herein. However, by signing the bid, the Bidder certifies that such cost does not exceed the limits established herein.

Waivers:

With prior concurrence from Federal Highway Administration (FHWA) headquarters, the Federal Highway Division Administrator may grant a waiver to specific projects provided it can be demonstrated:

1. that the use of domestic steel or iron materials would be inconsistent with the public interest; or
2. materials or products requested for use are not produced in the United States in sufficient or reasonably available quantities and are of satisfactory quality for use in the permanent work.

The waiver request shall be submitted with supportive information to include:

1. Project number\description, project cost, waiver item, item cost, country of origin for the product, reason for the waiver, and
2. Analysis of redesign of the project using alternative or approved equal domestic products

In order to grant such a waiver the request for the waiver must be published in the Federal Register for a period not less than 15 days or greater than 60 days prior to waiving such requirement. An initial 15 day comment period to the waiver will be available to the public by means of the FHWA website: <http://www.fhwa.dot.gov/construction/contracts/waivers.cfm>. Following that initial 15 day period of review and comment the request for waiver will be published by the FHWA in the Federal Register. The effective date of the FHWA finding, either to approve or deny the waiver request, will be 15 days following publication in the Federal Register.

Only the FHWA Administrator may grant nationwide waivers which still are subject to the public rulemaking and review process.

Alternative Bidding Procedures:

An alternative bidding procedure may be employed to justify the use of foreign iron and\or steel. To qualify under this procedure the total project is bid using two alternatives, one based on the use of domestic products and the other, the use of corresponding foreign source steel and\or iron materials.

In accordance with the provisions of Section 103.02 the Contract will be awarded to the lowest responsive and responsible bidder who submits the lowest total bid based on furnishing domestic iron or steel unless such total exceeds the lowest total bid based on furnishing foreign iron and\or steel by more than 25 percent, in which case the award will be made to the lowest responsive and responsible bidder furnishing foreign iron and\or steel based upon furnishing verifiable supportive data. The bidder shall submit a bid based on permanently incorporating only domestic iron and\or steel in the construction of the project. The bidder may also submit a bid for the same proposed contract based on being allowed to permanently incorporate corresponding foreign iron and\or steel materials meeting the other contract requirements into the work on the contract. If he chooses to submit such a bid, that alternate bid shall clearly indicate which foreign iron and\or steel items will be permanently

installed in the work as well as contain prices for all other items listed in the corresponding domestic proposal to complete a total "Foreign" bid.

In the event the contract is awarded to the bidder furnishing foreign iron and\or steel materials or items the provision for price adjustment of steel items will be permitted, however, price fluctuations shall use the U.S. index as stated in the Special Provision for Price Adjustment For Steel. The Contractor must indicate which corresponding eligible steel items he chooses price adjustment to apply. In the event the contract is awarded to a bidder furnishing foreign iron and\or steel items and during the life of that contract the Contractor discovers he can not furnish foreign iron and\or steel material as originally anticipated and agreed upon, he shall be responsible to honor the total bid price and furnish such iron and\or steel materials meeting the contract requirements from other sources as necessary to complete the work.

In the event the Contractor proposes to furnish "foreign" iron and steel and can verify a savings in excess of 25 percent of the overall project cost if bid using domestic materials, the Contractor shall submit a second complete paper bid proposal clearly marked "Foreign" including Form C-7 and supportive data supplement on all sheets. Supportive data shall list, but not be limited to, origin of material, best price offer, quantity and complete description of material, mill analysis, evidence or certification of conformance to contract requirements, etc. The "Foreign" bid shall be completed using the best price offer for each corresponding bid item supplying foreign material in the alternative bid and submit the same with the Contractor's "Domestic" bid. The Contractor shall write the word "Foreign" by the bid total shown on Form C-7 as well as last page of Schedule of Items showing the total bid amount. The bidder shall also contact the State Contract Engineer to inform him that he is also submitting an alternate "Foreign" paper bid..

The information listed on the supportive data sheet(s) will be used to provide the basis for verification of the required cost savings. In the event comparison of the prices given, or corrected as provided in Section 103.01 of the Specifications, shows that use of "foreign" iron and steel items does not represent a cost savings exceeding the aforementioned 25 percent, "domestic" iron and\or steel and prices given there for shall be used and the "100 percent Domestic Items Total" shall be the Contractor's bid.

Certification of Compliance:

Where domestic material is supplied, prior to incorporation into the Work, the Contractor shall furnish to the Department a certificate of compliance (such as may be furnished by steel mill test reports) that all steel and\or iron products supplied to the project except as may be permitted (one-tenth of one percent of the total contract cost or \$2,500, whichever is greater) and permanently incorporated into the work satisfies the domestic requirements herein. This certification shall contain a definitive statement about the origin of all products covered under the provisions of Buy America as stated herein.

In lieu of the Contractor providing personal certification, the Contractor may furnish a stepped certification in which each handler of the product, such as supplier, fabricator, manufacturer, processor, etc. furnishes an individual certification that their step in the process was domestically performed.

VDOT SUPPLEMENTAL SPECIFICATIONS (SSs), SPECIAL PROVISIONS (SPs) AND SPECIAL PROVISION COPIED NOTES (SPCNs)

Where Virginia Department of Transportation (VDOT) Supplemental Specifications, Special Provisions and Special Provision Copied Notes are used in this contract, the references therein to "the Specifications" shall refer to the *Virginia Department of Transportation Road and Bridge Specifications*, dated 2007 for both imperial and metric unit projects. References to the "Road and Bridge Standard(s)" shall refer to the *Virginia Department of Transportation Road and Bridge Standards*, dated 2008 for both imperial and metric unit projects. References to the "Virginia Work Area Protection Manual" shall refer to the 2011 edition of the *Virginia Work Area Protection Manual* for imperial and metric unit projects. References to the "MUTCD" shall refer to the 2009 edition of the *MUTCD* and the current *Virginia Supplement to the MUTCD* for imperial and metric unit projects.

Where the terms "Department", "Engineer" and "Contract Engineer" appear in VDOT Supplemental Specifications, Special Provisions and Special Provision Copied Notes used in this contract and the VDOT publication(s) that each references, the authority identified shall be in accordance with the definitions in Section 101.02 of the *Virginia Department of Transportation Road and Bridge Specifications*, dated 2007. Authority identified otherwise for this particular project will be stated elsewhere in this contract.

VDOT Supplemental Specifications, Special Provisions and Special Provision Copied Notes used in this contract and the VDOT publication(s) that each reference are intended to be complementary to the each other. In case of a discrepancy, the order of priority stated in Section 105.12 of the *Virginia Department of Transportation Road and Bridge Specifications*, dated 2007 shall apply.

VDOT Special Provision Copied Notes in this contract are designated with "(SPCN)" after the date of each document. VDOT Supplemental Specifications and Special Provision Copied Notes in this contract are designated as such above the title of each document.

The information enclosed in parenthesis "()" at the left of each VDOT Special Provision Copied Note in this contract is file reference information for VDOT use only. The information in the upper left corner above the title of each VDOT Supplemental Specification and VDOT Special Provision in this contract is file reference information for VDOT use only.

The system of measurement to be used in this project is stated elsewhere in this contract. VDOT Supplemental Specifications, Special Provisions and Special Provision Copied Notes containing imperial units of measure with accompanying expressions in metric units shall be referred to hereinafter as "dual unit measurement" documents. Such a "dual unit measurement" is typically expressed first in the imperial unit followed immediately to the right by the metric unit in parenthesis "()" or brackets "[]" where parenthesis is used in the sentence to convey other information. Where a "dual unit measurement" appears in VDOT documents, the unit that applies shall be in accordance with the system of measurement as stated elsewhere in this contract. The unit shown that is not of the declared unit of measurement is not to be considered interchangeable and mathematically convertible to the

declared unit and shall not be used as an alternate or conflicting measurement. Where VDOT Specifications are used for metric unit projects and only imperial units of measurement appear the document, the provision(s) in this contract for imperial unit to metric unit conversion shall apply.

12-1-11 (SPCN)

(c103i01-0814)

SECTION 103—AWARD AND EXECUTION OF CONTRACTS of the Specifications is amended as follows:

Section 103.09—Execution of Contract is amended to include the following:

According to Section 2.2-4308.2 of the *Code of Virginia*, any employer with more than an average of 50 employees for the previous 12 months entering into a contract in excess of \$50,000 with the Department to provide work or provide services pursuant to such contract shall register and participate in the U.S. Department of Homeland Security's "E-Verify" system to verify information and work authorization of its newly hired employees performing work pursuant to such contract.

Contractors are not required to be enrolled with "E-Verify" at the time bids are submitted, however, prior to award, the lowest responsive and responsible bidder must be enrolled with "E-Verify". Contractors may use the following website to enroll in "E-Verify", <http://www.uscis.gov/e-verify>.

8-8-14 (SPCN)

PERSONNEL REQUIREMENTS FOR WORK ZONE TRAFFIC CONTROL - Section 105 and 512 of the Specifications are amended as follows:

Section 105.14—Maintenance During Construction is amended to add the following:

The Contractor shall provide at least one person on the project site during all work operations who is currently verified either by the Department in Intermediate Work Zone Traffic Control, or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Supervisor (TCS). This person must have the verification card with them while on the project site. This person shall be responsible for the oversight of work zone traffic control within the project limits in compliance with the contract requirements involving the plans, specifications, the VWAPM, and the MUTCD. This person's duties shall include the supervision of the installation, adjustment (if necessary), inspection, maintenance and removal when no longer required of all traffic control devices on the project.

If none of the Contractor's on-site personnel responsible for the supervision of such work has the required verification with them or if they have an outdated verification card showing they are not currently verified either by the Department in Intermediate Work Zone Traffic Control, or by the American Traffic Safety Services Association (ATSSA) as a Traffic Control Supervisor (TCS) all work on the project will be suspended by the Engineer.

The Contractor shall provide at least one person on site who is, at a minimum, verified by the Department in Basic Work Zone Traffic Control for each construction and/or maintenance operation that involves installing, maintaining, or removing work zone traffic control devices. This person shall be responsible for the placement, maintenance and removal of work zone traffic control devices.

In the event none of the Contractor's on-site personnel of any construction/maintenance operation has, at a minimum, the required verification by the Department in Basic Work Zone Traffic Control, that construction/maintenance operation will be suspended by the Engineer until that operation is appropriately staffed in accordance with the requirements herein.

Section 512.03 Procedures is amended to add (r) **Work Zone Traffic Control** as the following:

- (r) **Work Zone Traffic Control:** The Contractor shall provide individuals trained in Work Zone Traffic Control in accordance with the requirements of Section 105.14 of the Specifications.

Section 512.04 Measurement and Payment is amended to add the following:

Basic Work Zone Traffic Control – Separate payment will not be made for providing a person to meet the requirements of Section 105.14 of the Specifications. The cost thereof shall be included in the price of other appropriate pay items.

Intermediate Work Zone Traffic Control - Separate payment will not be made for providing a person to meet the requirements of Section 105.14 of the Specifications. The cost thereof shall be included in the price of other appropriate pay items.

6-11-09a (SPCN)

(c105hf1-0309)

SECTION 105.06 SUBCONTRACTING of the Specifications is amended to include the following:

Any distribution of work shall be evidenced by a written binding agreement on file at the project site. Where no field office exists, such agreement shall be readily available upon request to Department inspector(s) assigned to the project.

The provisions contained in Form FHWA-1273 specifically, and other federal provisions included with the prime Contract are generally applicable to all Federal-aid construction projects and must be made a part of, and physically incorporated into all contracts, as well as, appropriate subcontracts for work so as to be binding in those agreements.

12-19-08 (SPCN)



Norfolk Southern Corporation
Bridges and Structures
1200 Peachtree Street NE
Atlanta, GA 30309-3579
Telephone (404) 529-1408
Fax (404) 527-2589

J. N. Carter Jr.
Chief Engineer

Subject: Roanoke, Virginia – Proposed Phase 2 Renovation of Virginia Depot, Located
Adjacent to Norfolk Southern Right of Way Near Milepost V-243.0.

May 21, 2014
File: 127-1-VA/ROW0047673

Mr. Jeffrey L. Sanders
President
Roanoke Chapter National Railway Historical Society
P.O. Box 13222
Roanoke, VA 24032-3222

Dear Mr. Sanders:

Reference is made to Barry Rakes' letter dated November 13, 2013, furnishing us, on behalf of the Roanoke Chapter, National Railway Historical Society, with the proposed scope of work and a plan view/plat of the subject building to be renovated.

We have reviewed the plan and proposal and have no objection to Roanoke Chapter, National Railway Historical Society (RCNRHS) proceeding with the proposed work provided the following conditions are met:

1. Our standard Special Provisions For Protection of Railway Interest, which govern the conduct of all work to be performed adjacent to and under/over operating tracks and stipulates the types and amount of insurance which must be kept in force for the duration of the project as it affects the Railway's operation of trains, will be made a part of the construction contract as requirements of the RCNRHS' contractor in performing work for this project.
2. When given proper notice by the RCNRHS' contractor, Norfolk Southern will provide, on a force account basis, for the watchman service and flagman protection deemed necessary for the safety of Railway operations. The RCNRHS has already been furnished a copy of the Railway's force account estimate attached and labeled Exhibit A. RCNRHS will be billed the actual cost of the Railway labor performed during or in preparation for the project.

Mr. Jeffry L. Sanders
May 21, 2014
File 127-1-VA/ROW0047673
Page 2

3. The RCNRHS accepts the privilege hereby granted with full cognizance of the risk of loss of life, personal injury and property loss or damage that may be caused by railway operations at or in the vicinity of the structure. The RCNRHS is willing to assume this risk and covenants that the privilege hereby granted shall be used and enjoyed at the sole risk of the RCNRHS, and that the Railway shall not have any responsibility whatever for any such loss, injury or damage. To that end, the RCNRHS hereby agrees to indemnify and save harmless Railway, its officers, agents and employees, from and against all liability, claims, loss, damage, expense (including attorney's fees) or costs for personal injuries (including death) and/or property damage to whomsoever or whatsoever, occurring or arising in any manner from construction and other activities at or on account of the Virginia Railway Depot owned by RCNRHS and being restored by its general contractor and others which may impinge upon railway operations at or in the vicinity of the Depot. The indemnify obligations imposed upon by this paragraph shall be absolute and shall not be affected by the negligence, either primary or contributory, of the Railway or its offices, agents and employees.

4. The Railway will prepare periodic billing for any services provided on behalf of the RCNRHS' contractor.

5. The RCNRHS will reimburse the Railway for all flagging protection, inspection services provided, and Engineering review performed by the Railway or its contract engineer upon receipt of the periodic billing.

6. The RCNRHS' contractor will not be allowed to commence work under, adjacent to, or over Norfolk Southern Railway's operating track until the following conditions have been met:

- A) The RCNRHS has received notice from Norfolk Southern Railway that the contractor's insurance has been approved.
- B) An on-site preconstruction meeting has been held with the Railway.
- C) The RCNRHS has received written authorization from Norfolk Southern Railway to begin work. The written authorization to proceed will include the name and telephone number of the local representative who must be contacted to arrange for railroad flag protection.
- D) Final Plans have been approved by Norfolk Southern
- E) The Construction Right of Entry Agreement, copy attached, has been executed by RCNRHS' contractor and Norfolk Southern.
- F) Real Estate document is in place providing for the use of a portion of the Railway's right-of-way for a parking area.

Mr. Jeffry L. Sanders
May 21, 2014
File 127-1-VA/ROW0047673
Page 3

7. The contractor will be required to maintain the following temporary construction/demolition clearances:

- A) Horizontal clearance measured from the centerline of track to form work, false work, or other obstruction: 25'-0".

The estimated flagging rate for this work is \$944 per 12-hour day, which includes the overhead additives for vacation, holiday, sickness, pension, administration, etc. Also, there may be an additional charge of \$100.00 per day (estimated) for any travel, meals, lodging, etc., required by the flagman.

Should the terms of this letter be satisfactory, please indicate your concurrence by signing in the space below and return one copy of this letter to me.

Please contact Scott Overbey at 404-582-5588 if you have any questions or wish to discuss this project.

Sincerely,

J. N. Carter, Jr.
Chief Engineer
Bridges and Structures

Accepted by the Roanoke Chapter, National Railway Historical Society

By: Gary W. Gray
Title: Vice PRESIDENT
Date: 8-5-14

Cy (By Email): Mr. Barry Rakes, Historic Architecture

**NORFOLK SOUTHERN
CONSTRUCTION RIGHT OF ENTRY AGREEMENT**

WHEREAS, _____ ("Principal") has requested that Norfolk Southern Railway Company ("Company") permit Principal to be on or about Company's premises and/or facilities at or in the vicinity of _____ Roanoke, VA _____ adjacent to Company's Milepost _____ V-243.00 _____ (the "Premises") for the sole purpose of _____ Rehabilitation of Virginian Depot adjacent to NS and construction of parking areas on Right-of-Way _____ during the period 8/1/14 To 12/31/15 (the "Right of Entry").

WHEREAS, Company is willing to grant the Right of Entry subject to the terms and conditions set forth herein.

NOW THEREFORE, in consideration of the foregoing and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the parties hereby agree as follows.

Company hereby grants Principal the Right of Entry. The Right of Entry shall extend to Principal and to subcontractors and other entities affiliated with Principal who are specifically approved for entry by authorized representatives of Company in writing, as well as to the officers and employees of the foregoing (collectively "Licensees"). The Right of Entry shall apply to those portions of the Premises, and to such equipment, machinery, rolling stock and other personal property and fixtures belonging to Company or otherwise located on the Premises, only to the extent specifically designated and approved in writing by authorized representatives of Company (collectively, "Designated Property").

Principal agrees:

- (i) that Licensees' access to the Premises shall be limited to the Designated Property and that Principal shall be liable and fully responsible for all actions of Licensees while on the Premises pursuant to the Right of Entry;
- (ii) that Licensees shall (a) be subject to Company's direction when upon the Premises, and (b) be subject to Company's removal from the Premises, in Company's sole discretion, due to negligence, misconduct, unsafe actions, breach of this agreement or the failure to act respectfully, responsibly, professionally, and/or in a manner consistent with Company's desire to minimize risk and maintain its property with maximum security and minimum distractions or disruptions or for any other lawful reason;
- (iii) that Licensees shall perform all work with such care, diligence and cooperation with Company personnel as to reasonably avoid accidents, damage or harm to persons or property and delays or interference with the operations of any Company's facilities and in accordance with Company's "Special Provisions for Protection of Railway Interest", attached and incorporated herein.
- (iv) to give Company's officer signing this agreement, or his or her authorized representative, advance notification of the presence of Licensees on Designated Property in accordance with Company's "Special Provisions for Protection of Railway Interest";
- (v) to indemnify and save harmless Company, its officers, agents and employees from and against any and all claims, demands, losses, suits, judgments, costs, expenses (including without limitation reasonable attorney's fees) and liability resulting from (a) injury to or death of any person, including without limitation the Licensees, and damage to or loss of any property, including without limitation that belonging to or in the custody of Licensees (the "Licensee Property"), arising or in any manner growing out of the presence of either the Licensees or the Licensee Property, or both, on or about the Premises, regardless of whether negligence on the part of Company, its officers, agents or employees caused or contributed to said loss of life, personal injury or property loss or damage in whole or in part; (b) any alleged violation of any law,

COSTS REIMBURSED BY CONTRACTOR
NS FILE: ROW0047673

statute, code, ordinance or regulation of the United States or of any state, county or municipal government (including, without limitation, those relating to air, water, noise, solid waste and other forms of environmental protection, contamination or pollution or to discrimination on any basis) that results in whole or in part, directly or indirectly, from the activities of Licensees related in any way to their presence on the Premises or from any other act or omission of Licensees contributing to such violation, regardless of whether such activities, acts or omissions are intentional or negligent, and regardless of any specification by Company without actual knowledge that it might violate any such law, statute, code, ordinance or regulation; (c) any allegation that Company is an employer or joint employer of a Licensee or is liable for related employment benefits or tax withholdings; or (d) any decision by Company to bar or exclude a Licensee from the Premises pursuant to subsection (ii)(b) above;

- (vi) to have and keep in effect the appropriate kinds of insurance as listed in the Company's "Special Provisions for Protection of Railway Interest, with insurance companies satisfactory to Company, during the entire time Licensees or Licensee Property, or both, is on the Premises: and to provide certificates of insurance showing the foregoing coverage, as well as any endorsements or other proper documentation showing and any change or cancellations in the coverage to the Company officer signing this agreement or to his or her authorized representative;
- (vii) to reimburse Company for any costs, including any material, labor, supervisory and protective costs (including flagging) and related taxes and overhead expenses required or deemed necessary by Company because of the presence of either Licensees or Licensee Property on the Premises. The Company's estimated costs are attached and incorporated herein;
- (viii) to exercise special care and precautions to protect the Premises and equipment, machinery, rolling stock and other personal property and fixtures belonging to Company or otherwise located on the Premises (whether or not constituting Designated Property) and to avoid interference with Company's operations;
- (ix) to not create and not allow drainage conditions which would be adverse to the Premises or any surrounding areas;
- (x) to refrain from the disposal or release of any trash, waste, and hazardous, dangerous or toxic waste, materials or substances on or adjacent to the Premises and to clean up or to pay Company for the cleanup of any such released trash, waste, materials or substances; and
- (xi) to restore the Premises and surrounding areas to its original condition or to a condition satisfactory to the Company officer signing this agreement or to his or her authorized representative (ordinary wear and tear to rolling stock and equipment excepted) upon termination of Licensees' presence on the Premises.

As a part of the consideration hereof, Principal further hereby agrees that Company shall mean not only Norfolk Southern Railway Company but also Norfolk Southern Corporation and any and all subsidiaries and affiliates of Norfolk Southern Railway Company or Norfolk Southern Corporation, and that all of Principal's indemnity commitments in this agreement in favor of Company also shall extend to and indemnify Norfolk Southern Corporation and any subsidiaries and affiliated companies of Norfolk Southern Railway Company or Norfolk Southern Corporation and its and/or their directors, officers, agents and employees.

It is expressly understood that the indemnification obligations set forth herein cover claims by Principal's employees, agents, independent contractors and other representatives, and Principal expressly waives any defense to or immunity from such indemnification obligations and/or any subrogation rights available under any applicable state constitutional provision, laws, rules or regulations, including, without limitation, the workers' compensation laws of any state. Specifically, (i) in the event that all or a portion of the Premises is located in the State of Ohio, the following provision shall be applicable: "Principal, with respect to the indemnification provisions contained herein, hereby expressly waives any defense or immunity granted or afforded it pursuant to Section 35, Article II of the Ohio Constitution and Section 4123.74 of the Ohio Revised Code"; and (ii) in the event that all or a

portion of the Premises is located in the Commonwealth of Pennsylvania, the following provision shall be applicable: "Principal, with respect to the indemnification provisions contained herein, hereby expressly waives any defense or immunity granted or afforded it pursuant to the Pennsylvania Workers' Compensation Act, 77 P.S. 481".

This agreement shall be governed by the internal laws of the Premises, without regard to otherwise applicable principles of conflicts of laws. If any of the foregoing provisions is held for any reason to be unlawful or unenforceable, the parties intend that only the specific words found to be unlawful or unenforceable be severed and deleted from this agreement and that the balance of this agreement remain a binding enforceable agreement to the fullest extent permitted by law.

This agreement may be amended only in a writing signed by authorized representatives of the parties.

REINICK CHAPMAN (RCHRS)
Name of Principal

By Gary W. Gray

Title Vice President

Date 8 - 5, 2017

NORFOLK SOUTHERN RAILWAY COMPANY

By _____

Title Chief Engineer Bridges & Structures

Date _____, 20_____

APPENDIX F: Instructions Regarding Use of Disadvantaged Business Enterprises (DBE)

- A. Phase II of the Virginian Station Project involves funding from the Federal Highway Administration (FHWA) through Virginia Department of Transportation (VDOT). A VDOT letter dated August 7, 2014 to the City of Roanoke authorized publication of the Invitation to Bid by Roanoke Chapter, NRHS. The same letter set forth that "bidders [must] understand that there is a six percent (6%) Disadvantaged Business Enterprise (DBE) goal on this project and understand the procedures for meeting this requirement. **Failure to meet the DBE goal will result in the inability of VDOT to award the contract, unless the bidder can demonstrate and document that they have made a good faith effort to meet the DBE goal.**"
- B. All bids and contracts must comply with VDOT Section 107.15 – Use of Disadvantaged Business Enterprises (DBEs) which begins at pdf page 551 of the Project Manual.
- C. The DBE Requirement of 6.0% should be inserted on VDOT form C-111 at pdf page 605 of the Project Manual.
- D. Attached to this addendum are pages provided by VDOT from the Department of Minority Business Enterprise (DMBE) website providing instructions for obtaining a listing of DBE contractors by Zip code or type of goods or services offered or performed.
- E. Please note from the DMBE directions that the Department administers three certification programs, SWaM (Small, Women-owned, and Minority-owned Businesses) operated by the Commonwealth of Virginia; DBE (Disadvantaged Business Enterprises) which is a Federal program; and ESO which is an Employment Services Organization program. **Only the DBE program applies to this project.**



<http://www.dmbe.virginia.gov>

[Home](#)[Contact Us](#) | [Search this Site](#)

Welcome

- [► About Us](#)
- [► SWaM Certification](#)
- [► DBE Certification](#)
- [► SWaM Vendor Search](#)
- [► DBE Vendor Search](#)

- [► SWaM Purchasing and Expenditure Reports](#)
- [► Programs](#)
- [► Special Request Forms](#)

- [► Procurement and Business Opportunities](#)

- [► Reports](#)
- [► Frequently Asked Questions](#)

- [► News and Resource Links](#)

We are the state agency dedicated to enhancing the participation of our small, women- and minority-owned businesses in Virginia's procurement process.

The Department of Minority Business Enterprise (**DMBE**) administers three certification programs:

1. **SWaM:** The Small, Women-owned, and Minority-owned Business (SWaM) certification program is a state program of the Commonwealth of Virginia. The purpose is to enhance procurement opportunities for SWaM businesses participating in state-funded projects.
2. **DBE:** The Disadvantaged Business Enterprise certification program is a Federal program. The purpose is to increase the participation of certified DBEs in projects funded by the US Department of Transportation and other federal sectors.
3. **ESO:** "Employment services organization" means an organization that provides community-based employment services to individuals with disabilities that is an approved Commission on Accreditation of Rehabilitation Facilities (CARF) accredited vendor of the Department for Aging and Rehabilitative Services.

[Apply for SWaM](#)
(apply for initial certification) (apply for re-certification)

Important Notice: If you are a non-Virginia based business, you might not be eligible for participation in the Virginia Small, Women- and Minority-owned Business Program. Please review the "DMBE Certification Policy of Applications from Non-Virginia Based Businesses" before applying online for SWaM certification or recertification. ([Click here](#))

[Apply for DBE](#)
(apply)

[Apply for ESO](#)
Application Form (PDF) | (Word)

VDOT Civil Rights Contact:
Chris Crain, PHR
District Civil Rights Manager
PO Box 3071, 731 Harrison Ave
Salem, VA 24153
Email: Chris.Crain@VDOT.Virginia.gov
Phone: (540) 387-5552
Fax: (540) 387-5327





- ▶ [About Us](#)
- ▶ [SWaM Certification](#)
- ▶ [DBE Certification](#)
- ▶ [SWaM Vendors Search](#)
- ▶ [DBE Vendors Search](#)
- ▶ [SWaM Purchasing and Expenditure Reports](#)
- ▶ [Programs](#)
- ▶ [Special Request Forms](#)
- ▶ [Bid and Business Opportunities](#)
- ▶ [Reports](#)
- ▶ [Frequently Asked Questions](#)
- ▶ [Links](#)

Disadvantaged Business Enterprise (DBE)

The Virginia Unified Certification Program includes two certifying agencies: Department of Minority Business Enterprise (DMBE) and the Metropolitan Washington Airport Authority (MWAA). Federal DBE certification by either agency is fully accepted throughout Virginia.

- To search for DBE vendors certified by DMBE and MWAA, please click [here](#).
- To view the Vendor Directory of DBEs certified by DMBE and MWAA, please click [here](#).

What's Hot

[SWaM Certification Application Status](#)

[SWaM Vendor Directory](#)

[DBE Certification Forms and Process](#)

[DBE Vendor Directory of VA Unified Certification Program](#)



Copyright © 2011, All Rights Reserved
Virginia Department of Minority Business Enterprise
1111 East Main Street, Suite 300 Richmond, VA 23219
Phone: (804) 786-5560
WAI Level A Compliant

[Web Policy](#) | [Contact Us](#)

[Word Viewer \(.doc\)](#) | [Adobe Acrobat Reader \(.pdf\)](#) | [Excel Viewer \(.xls\)](#) | [PowerPoint Viewer \(.ppt\)](#) | [WinZip \(.zip\)](#)



Home >> Disadvantaged Business Enterprise (DBE)

Contact Us | **Search this Site****Disadvantaged Business Enterprise (DBE)****Search by:**

Company Name	NAICS Code/Description	Zip & NAICS Code
--------------	-------------------------------	------------------

Company Name:

(At least 3 characters are required.)

OR**Select company name from the alphabetic lists:****Company Names A - M****Company Names N - Z****Company Names O - 9, Other**

Copyright © 2012, All Rights Reserved
Virginia Department of Minority Business Enterprise
1111 East Main Street, Suite 300 Richmond, VA 23219
Phone: (804) 786-6585
WAI Level A Compliant

[Web Policy](#) | [Contact Us](#)[Word Viewer \(.doc\)](#) | [Adobe Acrobat Reader \(.pdf\)](#) | [Excel Viewer \(.xls\)](#) | [PowerPoint Viewer \(.ppt\)](#) | [WinZip \(.zip\)](#)



Home >> Disadvantaged Business Enterprise (DBE)

Contact Us | **Search this Site****Disadvantaged Business Enterprise (DBE)****Search by:**

Company Name

 NAICS Code/Description Zip & NAICS Code**NAICS Code:**

(At least 3 digits are required.)

OR**NAICS Description:**

(At least 3 characters are required.)

Copyright © 2012, All Rights Reserved
Virginia Department of Minority Business Enterprise
1111 East Main Street, Suite 300 Richmond, VA 23219
Phone: (804) 786-6585
WAI Level A Compliant

[Web Policy](#) | [Contact Us](#)[Word Viewer \(.doc\)](#) | [Adobe Acrobat Reader \(.pdf\)](#) | [Excel Viewer \(.xls\)](#) | [PowerPoint Viewer \(.ppt\)](#) | [WinZip \(.zip\)](#)



Home >> Disadvantaged Business Enterprise (DBE)

[Contact Us](#) | [Search this Site](#)**Disadvantaged Business Enterprise (DBE)**[**<< Return to DBE Search**](#)

Search by NAICS description = pipe
 The following result(s) sorted by company name.

Total 14 search result(s)

<u>Federal Type</u>	<u>Certifying Agency</u>	<u>Cert #</u>	<u>Company Name, Mailing Address and Contact</u>	<u>Description of Service</u>	<u>DBE/ACDBE</u>
DBE/MBE	DMBE	672059	ATLANTIC CONSTRUCTION COMPANY, LLC 516 JACK ENDERS BOULEVARD, UNIT A BERRYVILLE VA 22611 Contact: STEPHEN GUNTANG Phone: (540)955-2575 Fax: (540)868-1199	NAICS Code and Description 237110: UTILITY LINE (I.E., SEWER, WATER), CONSTRUCTION 237130: UTILITY LINE (I.E., COMMUNICATION, ELECTRIC POWER), CONSTRUCTION 237120: PIPELINE, GAS AND OIL, CONSTRUCTION	DBE
DBE/MBE	DMBE	000766	BUSINESS PROMOTION CONSULTANTS INC DOING BUSINESS AS: BUSINESS PROMOTION CONSULTANTS INC 8730 GEORGIA AVE, SUITE, 312 SILVER SPRING MD 20910 Contact: MR. BILL BYRD Phone: (301)589-0942 Fax: (301)589-0946	NAICS Code and Description 327332: PRESTRESSED CONCRETE PIPES MANUFACTURING	DBE
DBE/MBE	DMBE	000638	CONCORR, INC. 45710 OAKBROOK COURT, SUITE 160 STERLING VA 20166 Contact: ALI AKBAR S. SOHANGHPURWALA Phone: (571)434-1852 Fax: (571)434-1851	NAICS Code and Description 541330: ENGINEERING SERVICES 237120: CORROSION PROTECTION, UNDERGROUND PIPELINE AND OIL	DBE

**Virginia Department of Transportation
Good Faith Effort (GFE) Guidelines**

Good Faith efforts may be determined through use of the following list of the types of actions the bidder may make to obtain DBE participation. This is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts of similar intent may be relevant in appropriate cases:

- Include the following completed forms:
 - Form C-111 – Minimum DBE Requirements
 - Form C-112 – Certification of Binding Agreement
 - Form C – 48 - Subcontractor/Supplier Solicitation and Utilization Form
 - Form C-49 – Summary of GFE Documentation
 - Copy of the Request for Bid Solicitation to DBEs
- Solicit through reasonable and available means, such as but not limited to, attendance at pre-bid meetings, advertising, and written notices to certified DBEs who have the capability to perform the work of the contract. Examples include: advertising in at least one daily newspaper of general circulation; phone contact with a completely documented telephone log, including the date and time called, contact person, or voice mail status; and internet contacts with supporting documentation, including dates advertised.
- Solicit DBEs no less than five (5) business days before the bids are due so that the solicited DBEs have enough time to reasonably respond to the solicitation.
- Follow up initial solicitations as evidenced by documenting such efforts on Department standard good faith documentation form, C-49.
- Select portions of the work to be performed by certified DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items completely or with its own forces.
- Provide interested certified DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner, which will assist the DBEs in responding to a solicitation.
- Provide evidence of names, addresses, and telephone numbers of DBEs that were considered for the solicitation; dates DBEs were contacted, a description of the information provided regarding the plans, specifications, and requirements of the contract for the work selected for subcontracting, and, if insufficient DBE participation seems likely, evidence as to why additional agreements could not be reached for DBEs to perform the work.
- For DBE bids declared non-competitive, include copies of DBE and non-DBE bid quotes. DBE quotes may be rejected as non-competitive if the DBE sub's quote is more than 10% higher than the non-DBE's quote, as verified by supporting documentation. The prime must contract with the non-DBE sub when declaring a DBE firm non-competitive.
- Offered assistance to DBEs in obtaining bonding, lines of credit, or insurance.
- Offered assistance to DBEs with information about securing equipment, supplies, materials, or related assistance/services.
- Provided DBEs with adequate information to provide a quote.
- Effectively utilized the services of appropriate personnel from VDOT, the Virginia Department of Minority Business Enterprise (VDMBE), the Metropolitan Washington Airports Authority (MWAA), and other organizations in the recruitment and utilization of qualified DBEs.



Chris Crain
Salem District Civil Rights Manager

731 Harrison Avenue
Salem, VA 24153
PH: 540.387.5552 Blackberry 540.521.0587
Email: chris.crain@vdot.virginia.gov