17063
DAMASCUS TRAIL CENTER
DAMASCUS, VIRGINIA

TOWN OF DAMASCUS
208 W. LAUREL AVENUE
DAMASCUS, VA 24236

OCTOBER 15, 2019

PROJECT MANUAL

McCARTY HOLSAPE McCARTY
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END OF SECTION 00.01.10
SECTION 00.11.16
INVITATION TO BID

Sealed bids in duplicate for the Damascus Trail Center at 223 W. Laurel Ave., Damascus, VA 24236, will be received at the office of the Town Manager, 208 W. Laurel Ave., Damascus, VA 24236 until 2:00 pm o’clock, local prevailing time, December 03, 2019. The bids will be publicly opened and read aloud at that time.

Withdrawal of bids due to error shall be according to Section 2.2-4330.B.2 of the Virginia Public Procurement Act. The bidder shall have two hours after the opening of bids within which to claim in writing any mistake as defined herein and withdraw his bid. The contract shall not be awarded by the public body until the two-hour period has elapsed.

Unless cancelled or rejected, the responsive bid from the lowest responsible bidder shall be accepted as submitted, except that if the bid from the lowest responsible bidder exceeds available funds, the Public Body or designated official may negotiate with the low bidder to obtain a contract within available funds. Negotiation will occur with the low responsive and responsible bidder per Virginia Public Procurement.

Contract is to be awarded on a Stipulated Sum basis. Contract documents, including Instructions for Bidders, drawings and specifications, may be examined at Damascus Town Hall, 208 W. Laurel Ave., Damascus, VA 24236. Digital copies of contract documents may be requested from McCarty Holsaple McCarty Architects, 550 W. Main Street, Suite 300, Knoxville, TN 37902. Contact David Collins at 865-544-2000. Digital copies may also be retrieved by contacting Gavin Blevins at 276-783-5103 or gblevins@mrpdc.org.

Bids must be accompanied by a bid guarantee as specified in the Instructions for Bidders. A pre-bid conference will be held at 11:00 am o’clock, local prevailing time, on November 14th, 2019 at the Damascus Town Hall, 208 W. Laurel Ave., Damascus, VA 24236.

Qualifications of bidders will be required as detailed in the Instructions for Bidders. Details include: contracts on hand (amount of each contract and anticipated dates of completion), major equipment available for this contract, experience in construction similar to this project, credit available, and default on previous contracts or failure to complete any work awarded. Bidders must be licensed as a Class A contractor or registered as a Class B contractor in the Commonwealth of Virginia. The bidder’s attention is directed to the Code of Virginia, Title 54.1, Chapter 11.

This is a federally assisted project. Bidders and contractors performing work under this advertisement are bound by the requirements of President's Executive Order 11246 as amended by Executive Order 11375; Title VI of the Civil Rights Act of 1964; Section 109 of Title 1 of the Housing and Community Development Act of 1974, as amended; Section 3 of the Housing and Urban Development Act of 1968; the Immigration Reform and Control Act of 1986; the Davis-Bacon Act; the Copeland “Anti Kickback” Act; the Contract Work Hours and Safety Standards Act; and Public Law 100 202. The bidder’s attention is called to the "Equal Opportunity Clause" and the goals and timetables for minority and female participation in each trade and to the fact that not less than minimum wages set forth in the contract documents must be paid. Construction shall comply with the requirements of the erosion control ordinances of Washington County, VA.

Construction Documents
October 15, 2019

INVITATION TO BID
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participation in each trade and to the fact that not less than minimum wages set forth in the contract documents must be paid. Construction shall comply with the requirements of the erosion control ordinances of Washington County, VA.

The Town of Damascus is an EEO employer. SBE/MBE/WBE contractors are encouraged to bid on this project.

______________________________
(Public Body)

By: ____________________________

END OF SECTION 00.11.16
PART 1 SUMMARY

1.01 PREPARATION AND SUBMISSION OF BIDS

A. Bids shall be submitted in duplicate on the forms furnished, or copies thereof, and shall be signed in ink. Erasures or other changes in a BID must be explained or noted over the signature of the BIDDER. BIDS containing any conditions, omissions, unexplained erasures, alterations or items not called for in the proposal, or irregularities of any kind, may be rejected by the Town of Damascus as being incomplete.

B. Each BID must give the full business address of the BIDDER and be signed by him with his 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, secretary or other person authorized to bind it in the matter. The name of each person signing shall also be typed or printed below the signature. A BID by a person who affixed to his signature the word "President," "Secretary," "Agent," or other designation without disclosing his principal, may be held to be the BID of the individual signing. When requested by the Town of Damascus, satisfying evidence of the authority of the officer signing in behalf of the corporation shall be furnished.


D. BIDS with the BID GUARANTEE shall be enclosed in a sealed envelope which shall be marked and addressed as indicated by the advertisement. 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 be 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 be registered 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, inserting his contractor license or registration number:

a. Licensed Class A Virginia
   Contractor No. ________________________

b. Registered Class B Virginia
   Contractor No. ________________________

E. If the BIDDER shall fail to provide this information on his BID or on the envelope containing the BID and shall fail to promptly provide said information to the Town of Damascus in writing when requested to do so before or after the openings of BIDS, he shall be deemed to be in
violation of Section 54.1-1112 of the Code of Virginia (1950), as amended, and his BID will not be considered.

F. The Town of Damascus reserves the right to disqualify any contractor and refuse to accept the BID of any BIDDER which has been convicted, or entered a plea of guilty or nolo contendere in any federal or state court to any charge involving any unlawful, corrupt or collusive practice involving a public contract either federal, state, or local, or which has been determined in any judicial proceeding to have violated any antitrust bid-rigging or collusive practice statutes in connection with any public contract, or against whom such formal criminal prosecution or other judicial proceeding has been initiated.

1.02 BID BOND

A. Any BID exceeding one-hundred thousand dollars ($100,000) shall be accompanied by a bid bond from a surety company selected by the BIDDER which is legally authorized to do business in Virginia in the amount of five percent (5%) of the amount of the bid. In lieu of a bid bond, a BIDDER may furnish a certified check or cash escrow in the face amount required for the bond. Such bid guarantee shall be submitted with the understanding that it shall guarantee that the BIDDER will not withdraw his bid during the period of (30-60-90) days following the opening of BIDS; that if his BID is accepted, he will enter into a formal CONTRACT with the Town of Damascus in accordance with the Form of Agreement included as a part of the CONTRACT DOCUMENTS, and that the Standard Performance Bond and the Standard Labor and Material Payment Bond will be given.

B. In lieu of a performance bond or a payment bond, a BIDDER may furnish a certified check or cash escrow in the face amount required for the bond. If approved by the attorney of (name of political subdivision) after determining that the alternate form of security proffered affords protection to the (name of political subdivision)'s equivalent to a corporate surety's bond, a bidder may furnish a personal bond, property bond, or bank or savings and loan association's letter of credit on certain designated funds in the face amount required for the bid, payment or performance bond. And further, that in the event of the withdrawal of said BID within said period, or failure to enter into said CONTRACT and give said bonds within ten (10) days after he has received notice of acceptance of his BID, the BIDDER shall be liable to the Town of Damascus for the lesser of (i) the difference between the BID for which the bond was written and the next low BID, or (ii) the face amount of the bid bond. This amount represents the damage to the Town of Damascus on account of the default of the BIDDER in any particular hereof.

C. The bid guarantees will be returned to all except the three lowest BIDDERS after the formal opening of bids. The remaining bid guarantees will be returned after the Town of Damascus and the accepted BIDDER(S) have executed the CONTRACT and the Performance Bond and the Payment Bond have been delivered to the Town of Damascus.

D. If the required CONTRACT and bonds have not been executed within 60 days after the date of the opening of the BIDS, then the bid guarantee of any BIDDER will be returned upon his request, provided he has not been notified of the acceptance of his BID prior to the date of such request.

1.03 ERRORS IN BID

A. The BIDDER must submit to the Town of Damascus or designated official his original work papers, documents, and materials used in the preparation of the BID within two days after the
conclusion of the bid opening procedure. Such work papers must be in an envelope or package separate and apart from the envelopes containing the BID and marked clearly as to the contents and shall be delivered by the BIDDER in person or by registered mail. Such mistake must be clerical as opposed to judgmental and actually due to an unintentional arithmetic error or an unintentional omission that can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used for the preparation of the bid sought to be withdrawn.

B. Failure of a BIDDER to submit his original work papers, documents and materials used in the preparations of his BID at the time, date and place required shall constitute a waiver by the BIDDER of his right to claim any mistake in his BID.

C. No bid may be withdrawn due to error when the result would be the awarding of the contract on another BID of the same BIDDER or of another BIDDER in which the ownership of the withdrawing BIDDER is more than five percent (5%).

D. If a bid is withdrawn due to error, the lowest remaining bid shall be deemed to be the low bid. No bidder who is permitted to withdraw a BID shall, for compensation, supply any material or labor to or perform any subcontract or other work agreement for the person or firm to whom the CONTRACT is awarded or otherwise benefit, directly or indirectly, from the performance of the PROJECT for which the withdrawn BID was submitted.

E. If the Town of Damascus denies the withdrawal of a bid under the provisions of section 11-54 of the Code of Virginia, it shall notify the bidder in writing stating the reasons for its decision and award the contract to such bidder at the bid price, provided such bidder is a responsible bidder.

1.04 CANCELLATION, REJECTION OF BIDS, WAIVER OF INFORMALITIES

A. The Town of Damascus reserves the right to waive informalities in bids and to cancel or reject any and all bids.

1.05 AWARD OF CONTRACT

A. Unless cancelled or rejected, if the lowest base responsive BID submitted by a responsible BIDDER does not exceed the amount of funds available, the contract will be awarded on the base bid only. In the event such bid exceeds the amount of funds available, the Town of Damascus may consider the deductive items, in the order listed, and apply to all bidders to determine the lowest base responsive BID submitted by a responsible BIDDER.

1.06 INSPECTION OF SITE AND CONDITIONS OF WORK

A. BIDDERs should visit the site of the proposed PROJECT and become fully acquainted with the pertinent local conditions such as location, accessibility and general character of the site or building, and the character and extent of existing work within or adjacent to the site. BIDDERs should thoroughly examine the DRAWINGS, SPECIFICATIONS, and all other CONTRACT DOCUMENTS. Claims, as a result of failure to do so, will not be considered by the Town of Damascus.

1.07 QUALIFICATIONS OF BIDDERS

A. Each BIDDER shall upon request of the Town of Damascus submit on the form furnished for that purpose (a copy of which is included herein), a statement of the BIDDER’s qualifications,
his experience record in constructing the type of improvements embraced in the CONTRACT, his organization and equipment available for the WORK contemplated.

B. The Town of Damascus shall have the right to take such steps as it deems necessary to determine the ability of the BIDDER to perform his obligation under the CONTRACT and the BIDDER shall furnish the Town of Damascus all such information and data indicated on the form. The right is reserved to reject any BID where an investigation of the available evidence or information does not satisfy the Town of Damascus that the BIDDER is qualified to carry out properly the terms of the CONTRACT.

1.08 ADDENDA AND INTERPRETATIONS

A. No oral interpretation will be made to any BIDDER as to SPECIFICATIONS or any other part of the CONTRACT DOCUMENTS.

B. Every request for such an interpretation shall be made in writing addressed to David S. Collins, AIA at dcollins@mhminc.com at McCarty Holsaple McCarty, Inc. and to be given consideration must be received at least seven days prior to the date fixed for opening of bids.

C. Every interpretation made to a BIDDER will be in the form of an Addendum to the CONTRACT DOCUMENTS, and when issued, will be on file in the office of the Town of Damascus and the office of the Architect, at least five days before bids are opened. All ADDENDA will be mailed to each person holding CONTRACT DOCUMENTS, but it shall be the BIDDER’S responsibility to make inquiry as to the ADDENDA issued. All such ADDENDA shall become part of the CONTRACT and all BIDDERS shall be bound by such ADDENDA, whether or not received by the BIDDERS.

1.09 ADDITIONAL INSTRUCTIONS

A. The Town of Damascus is prohibited from making an award to contractors or approving an award to subcontractors for any contract/subcontract in excess of $10,000 who are debarred by the United States Department of Labor, the Department of Housing and Urban Development or by an agency of the Commonwealth of Virginia, or who are not in compliance with the Federal Equal Employment Opportunity requirements.

B. Approval of a proposed subcontract award cannot be given by the Town of Damascus unless and until the proposed subcontractor has submitted the Bidder Compliance Statement, Certification Regarding Equal Employment Opportunity, and a Certification of Bidder Regarding Debarment by Agency of the Commonwealth of Virginia, subject to the provisions of above. Although the BIDDER is not required to attach such Certifications by proposed subcontractors to his BID, the BIDDER is herein advised of these requirements so that appropriate action can be taken to prevent subsequent delay in subcontract awards.

END OF SECTION 00.11.17
1.01 THE PROJECT AND THE PARTIES

A. TO: Town of Damascus
   208 W. Laurel Ave.
   Damascus, VA 24236
   FOR: Damascus Trail Center

B. DATE: ______________ (BIDDER TO ENTER DATE)

C. SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)
   1. Bidder’s Full Name
      ___________________________________________________________
   2. Address
      ___________________________________________________________
   3. City, State, Zip
      ___________________________________________________________

D. OFFER
   1. Having examined the Place of The Work and all matters referred to in the Instructions to
      Bidders and the Contract Documents prepared by McCarty Holsaple McCarty for the above
      mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform
      the Work for the sum of:
      ___________________________________________________________
      __________________________________________________________ dollars
      ($______________________), in lawful money of the United States of America.
   2. All applicable federal, state and local taxes are included in the Bid Sum, with the exception
      of items that qualify for purchase tax free for a tax-exempt organization.

E. ACCEPTANCE
   1. This offer shall be open to acceptance and is irrevocable for sixty days from the bid closing
      date.
   2. If this bid is accepted by the Town of Damascus within the time period stated above, we
      will:
      a. Commence work within seven days after written Notice to Proceed of this bid.
   3. If this bid is accepted within the time stated, and we fail to commence the Work or we fail
      to provide the required Bond(s), the security deposit shall be forfeited as damages to the
      Town of Damascus, by reason of our failure, limited in amount to the lesser of the face
      value of the security deposit or the difference between this bid and the bid upon which a
      Contract is signed.
   4. In the event our bid is not accepted within the time stated above, the required security
      deposit shall be returned to the undersigned; unless a mutually satisfactory arrangement is
      made for its retention and validity for an extended period of time.

F. CONTRACT TIME
   1. If this Bid is accepted, we will:
   2. Complete the Work in ________________ calendar days from Notice to Proceed.
      (Bidder to enter number of days.)

G. ALTERNATES
   1. Alternate No. 1: Not used
a. _____________________________________($__________ )

2. Alternate No. 2: Not used
   a. _____________________________________($__________ )

H. UNIT PRICES
1. The following are Unit Prices for specific portions of the Work as listed:
   a. Rock Excavation – Open; in open excavation, removal from site and legal disposal of unsuitable material. $_______________/CY
   b. Rock Excavation - Trenches; in trenches and pits, removal from site and legal disposal of unsuitable material. $__________/CY
   c. Unsuitable Soil; Excavation beyond indicated subgrade elevations due to unsuitable subgrade conditions, removal from site and legal disposal of unsuitable material. $_______________/CY
   d. Borrow Material as Fill; Procurement, hauling, placement and compaction of off-site borrow soil material, acceptable for use as fill. $______________/CY
   e. Excavation of Unsuitable Soil, Relocation and Compaction On-site; Excavation beyond indicated subgrade elevations due to unsuitable subgrade conditions, relocation and compaction on-site. $___________/CY
   f. Compacted Granular Fill: Procurement, hauling, placement of off-site granular fill material, acceptable for use as fill in excess of indicated of reasonably inferred quantities $______________/Ton.
   g. Additional Footing Concrete; Procurement, hauling, placement of additional footing concrete, when required to address field conditions. $__________/CY

I. CHANGES TO THE WORK
1. When Architect establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:
   a. ______ percent overhead and profit on the net cost of our own Work;
   b. ______ percent on the cost of work done by any Subcontractor.

J. ADDENDA
1. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
   a. Addendum # _______ Dated ________________.
   b. Addendum # _______ Dated ________________.
   c. Addendum # _______ Dated ________________.

K. BID FORM SIGNATURE

1. ____________________________________________
   (Bidder - print the full name of your firm)

2. ____________________________________________
   (Authorized signing officer, Title)

END OF SECTION 00.41.00
SECTION 00.43.94
BID ENVELOPE COVER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. On the accompanying page is the Bid Envelope Cover that must be attached to the outside of the submitted bid. The Bid Envelope Cover must be completely filled out in order for the Bid to be opened and considered.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 00.43.94
Bid to:  

Town of Damascus

For the Project:  

Damascus Trail Center  
223 W. Laurel Ave.  
Damascus, VA 24236

Project Designer:  

McCarty Holsaple McCarty, Inc.

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**Any blank spaces may cause bid to be unacceptable and rejected.**

Provide state contractor license number, expiration date, and classification for Bidder and listed subcontractors, as applicable. Provide all names as used for licensing or other legal transactions.

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**Bidder Identification:**

Bidder:  
______________________________

Address:  
______________________________

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**Virginia Contractor License Information:**

License Number:  

______________________________

License Classification applicable to Project:  

______________________________

License expiration date:  

______________________________  
Dollar Limit  

______________________________

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**Subcontractors to be used on this Project:**  
(or Bidder, if Bidder is to perform the work)

- If any work, regardless of dollar value, is required for subcontractor category, list subcontractor that will perform that work. Or, if Bidder will perform that work in a category with Bidder’s own forces, fill in Bidder’s name as subcontractor.
- If no work is required in a subcontractor category, write “N/R.” (None Required) or “N/A” (Not Applicable).
- If the monetary amount of a subcontractor’s work is such that no license is required, “N/A” may be written in the license number column, but still write name.

**Plumbing**

Name  
______________________________

Note: This space must be filled in or the bid may not be opened.  
License Number  
Expiration Date  
Classification

**HVAC**

Name  
______________________________

Note: This space must be filled in or the bid may not be opened  
License Number  
Expiration Date  
Classification

**Electrical**

Name  
______________________________

Note: This space must be filled in or the bid may not be opened.  
License Number  
Expiration Date  
Classification

**Masonry**

Name  
______________________________

Note: This space must be filled in or the bid may not be opened.  
License Number  
Expiration Date  
Classification

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This Bid Envelope approved for public opening  
______________________________  
Signature of Designer or their representative
SECTION 00.50.00
CONTRACTING FORMS AND SUPPLEMENTS

PART 1  GENERAL

1.01 AGREEMENT AND CONDITIONS OF THE CONTRACT
   A. See Section 00.52.00 - Agreement Form to be executed.
   B. See Section 00.72.00 - General Conditions.
   C. See Section 00.73.43 – Wage Rate Requirements

1.02 FORMS
   A. Use the following attached forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.
      1. Bid Bond
      2. Performance Bond
      3. Certification Regarding Debarment
      4. Labor and Material Payment Bond
   B. Post-Award Certificates and Other Forms:
      1. Schedule of Values Form: AIA G703.
      2. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).
   C. Clarification and Modification Forms:
   D. Closeout Forms:

1.03 REFERENCE STANDARDS
   A. AIA A101- Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum; 2017.

PART 2  PRODUCTS – NOT USED

PART 3  EXECUTION – NOT USED

END OF SECTION 00.50.00
SECTION 00.52.00
AGREEMENT FORM

PART 1  GENERAL

1.01  FORM OF AGREEMENT
   A. The Form of Agreement shall be A101 – 2017 Standard Form of Agreement Between Owner and Contractor – Stipulated Sum, with ARC Modifications.

PART 2  PRODUCTS – NOT USED

PART 3  EXECUTION – NOT USED

END OF SECTION 00.52.00
General Conditions - Part I

1. Definitions
2. Engineer’s Authority
3. Materials, Services, Workmanship and Facilities
4. Equals
5. Additional Instructions and Detail Drawings
6. Requests for Supplemental Information
7. Shop Drawings
8. Drawings and Specifications
9. Warranty of Title
10. Samples, Certificates and Tests
11. Surveys, Permits, and Codes
12. Patents
13. Superintendence by Contractor
14. Protection of Work, Property and Persons
15. Accident Prevention
16. Sanitary Facilities
17. Use of Premises/Storage
18. Schedules, Reports and Records
19. Inspection
20. Payments to Contractor
21. Payments by Contractor
22. Public Body’s Use of Premises
23. Changes in the Work
24. Claims for Extra Cost/Subsurface Conditions
25. Time for Completion and Liquidated Damages
26. Suspension of Work, Termination and Delay
27. Correction of Work
28. Cleanup Requirements
29. Fitting and Coordination of the Work
30. Subcontracting
31. Separate Contracts
32. Lands and Rights-of-Way
33. As Constructed Drawings
34. Final Inspection and Closeout
35. Insurance
36. Assignment of Contract
37. Indemnification
38. Guarantee
39. Notices
40. Access to Records
41. Withholding of Funds
42. Federal Funding Termination
43. Interest of Contractor
44. Political Activity
45. Interest of Officials
46. Provisions Required by Law Deem Inserted
47. Contract Security
48. Contractual Disputes
49. Administrative Appeals Procedure and Arbitration
50. Other Contractual Requirements

General Conditions Part I must be included in CDBG contracts unless another substantially equivalent contract is provided by another state or federal agency which provides funding for the same activity and equivalency is certified by the Project Engineer. In such case, Section 40 Access to Records and all reference to Virginia Code provisions must be included.
1. Definitions

A. Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated and shall be applicable to both the singular and plural thereof:

B. ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications, or corrections.

C. BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

D. BIDDER - Any person, firm, or corporation submitting a BID for the WORK.

E. BONDS - Bid, Performance, and Payment Bonds and other instruments of surety, furnished by the CONTRACTOR and the CONTRACTOR'S surety in accordance with the CONTRACT DOCUMENTS.

F. CHANGE ORDER – A written amendment to the construction contract between the CONTRACTOR and OWNER that changes either the CONTRACT PRICE and/or the CONTRACT TIME. All change orders must be approved by DHCD prior to their execution and must be signed by the ENGINEER/ARCHITECT, OWNER, CONTRACTOR and DHCD.

G. CONTRACT DOCUMENTS - The contract, including Invitation to BID, Instructions for BIDDERS, BID, BID BOND, Agreement, Payment BOND, Performance BOND, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

H. CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

I. CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

J. CONTRACTOR - The person, firm, or corporation with whom the OWNER has executed the Agreement.

K. DRAWINGS - The parts of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

L. ENGINEER - The engineer or architect responsible for the design and quality control of the WORK and so designated by the CONTRACT DOCUMENTS; or any other person or firm so designated by the PUBLIC BODY.
M. FIELD ORDER - A written order effecting a change in the WORK but not altering the scope of the project or involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

N. NOTICE OF AWARD - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

O. NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date for commencement of the WORK.

P. PROJECT - The undertaking to be performed in the manner as provided in the CONTRACT DOCUMENTS.

Q. PROJECT MANAGER - The authorized representative of the PUBLIC BODY for the PROJECT so named in the CONTRACT DOCUMENTS or any other person so designated by the PUBLIC BODY.

R. PUBLIC BODY - The legislative, executive or judicial body, agency, office, department, authority, post, commission, committee, institution, board or political subdivision created to perform some governmental duty, and which is empowered by law to undertake the activities described in the CONTRACT DOCUMENTS; and which is designated as such in the Agreement of the CONTRACT DOCUMENTS.

S. SCOPE OF THE PROJECT - The defined geographic area as set forth in the CDBG contract between the GRANTEE and DHCD within which construction improvements are being made that will benefit LMI persons who reside within that area.

T. SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

U. SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

V. SUBCONTRACTOR - An individual, firm, or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

W. SUBSTANTIAL COMPLETION - That date certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in
accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

X. SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

Y. WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

Z. WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at their last given address, or delivered in person to said party or their authorized representative on the WORK.

2. Engineer’s Authority

A. The ENGINEER shall act as the PUBLIC BODY’s representative during the construction period in the capacity as detailed in the CONTRACT DOCUMENTS. The ENGINEER shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed, and shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER shall make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

B. Inspections may be at the factory or fabrication plant of the source of material supply.

C. The ENGINEER shall not be responsible for the construction means, controls, techniques, sequences, procedures or construction safety.

D. The ENGINEER shall promptly make decisions relative to the interpretation of the CONTRACT DOCUMENTS, insofar as he has the authority to do so by provisions of the CONTRACT DOCUMENTS in his capacity as representative of the PUBLIC BODY.

3. Materials, Services, Workmanship and Facilities

A. It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary
construction of any nature, all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

B. Materials shall be stored so as to insure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

C. Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

D. Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

E. The CONTRACTOR shall submit to the ENGINEER for approval the manufacturer's detailed specifications for all machinery, mechanical and other special equipment, which is to be installed in the WORK. The CONTRACTOR shall further submit full information as to type, performance characteristics, and all other pertinent information as required concerning such equipment. The CONTRACTOR shall submit to the ENGINEER for approval full information, as required, concerning all other materials or articles which he proposes to incorporate in the WORK.

F. Machinery, mechanical and other equipment, materials and articles installed or used without such prior approval shall be at the risk of subsequent rejection.

G. Materials specified by reference to the number or symbol of a specific standard, such as on A.S.T.M. Standards, a Federal Specification or other similar standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Invitation To Bids, except as limited to type, class, or grade, or modified in such reference. The standards referred to, except as modified in the SPECIFICATIONS, shall have full force and effect as though printed therein.

H. Unless otherwise specifically provided for in the SPECIFICATIONS, all workmanship, equipment, materials and articles incorporated into the WORK shall be new and the best grade of respective kinds for the purpose.

4. **Equals**

Whenever a material, article or piece of equipment is identified in the SPECIFICATIONS by reference to manufacturer's or vendor's names, trade names, catalog numbers, etc. it is intended merely to establish a standard; and unless otherwise provided in the Invitation to Bid any material, article, or equipment of other manufacturers and vendors which the ENGINEER determines to be equal of that specified, considering quality, workmanship, economy of operation, and suitability of purpose intended, shall be accepted. The purchase
or installation of such substituted material or equipment will not be allowed without the ENGINEER'S prior written approval.

5. **Additional Instructions and Detail Drawings**

A. The CONTRACTOR may be furnished, with additional instructions and detail drawings by the ENGINEER, as necessary to carry out the CONTRACT DOCUMENTS.

B. The additional drawings and instructions thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawing and instructions.

6. **Requests for Supplemental Information**

A. The CONTRACTOR shall request that the ENGINEER provide any additional information not already in his possession in order to execute the WORK. Such requests shall be made in a timely manner as the need appears, and shall be submitted in sufficient advance to allow preparation and appropriate action to be taken so as to avoid delay.

B. Requests which shall be in writing must list the necessary items and the date by which each will be required by the CONTRACTOR. The first such list shall be submitted within two weeks after AWARD of CONTRACT and shall be as complete as possible at that time.

C. The CONTRACTOR shall furnish any assistance and information the ENGINEER may require in responding to these requests.

D. The CONTRACTOR shall be fully responsible for any delays in his work or to others due to his failure to comply with the provisions of this section.

7. **Shop Drawings**

A. The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS.
B. The approval of a SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

C. The approval of a SHOP DRAWING which the ENGINEER deems to be a minor adjustment of the CONTRACT DOCUMENTS not involving scope change a change in the contract price or extension of time shall be evidenced by written documentation in substance, as follows:

"The modification shown on the attached drawing is approved in the interest of the PUBLIC BODY to effect an improvement for the project and is ordered with the understanding that it does not involve any change in scope, contract price or time; that it is subject generally to all CONTRACT DOCUMENTS and that it is without prejudice to any and all rights of the PUBLIC BODY under the CONTRACT and bond or bonds."

D. When submitted for the ENGINEER'S review, SHOP DRAWINGS shall be the CONTRACTOR’S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

E. Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission have been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR on the site and shall be available to the ENGINEER.

8. Drawings and Specifications

A. The intent of the DRAWINGS AND SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and for all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy, or operation by the PUBLIC BODY.

B. In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over general DRAWINGS.

C. Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done
by the CONTRACTOR after discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the CONTRACTOR'S risk.

9. Warranty of Title

A. No material, supplies, or equipment to be installed or furnished under this contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease purchase or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The CONTRACTOR shall warrant good title to all materials, supplies, and equipment installed or incorporated in the WORK, and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the PUBLIC BODY free from any claims, liens or charges.

B. Neither the CONTRACTOR nor any person, firm, or corporation furnishing any material or labor for any work covered by this contract shall have any right to lien upon any improvement or appurtenance thereon.

C. Nothing in this section, however, shall impair the right of persons furnishing materials or labor to recover under any bond given by the CONTRACTOR or any rights under the law permitting such persons to look to the funds due the CONTRACTOR in the hands of the PUBLIC BODY.

D. The provisions of this section shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the WORK when no formal contract is entered into for such materials.

10. Samples, Certificates and Tests

A. The CONTRACTOR shall submit all materials or equipment samples, certificates, affidavits, etc. as required by the ENGINEER or called for in the CONTRACT DOCUMENTS. No such material or equipment shall be manufactured or delivered at the site except at the CONTRACTOR'S BOND, and except at the CONTRACTOR'S risk until required samples have been approved in writing by the ENGINEER. Any delay in the WORK caused by late or improper submission of samples or certificates for approval shall not be considered just cause for extension of contract time.

B. Each sample submitted by the CONTRACTOR shall carry a label giving the name of the CONTRACTOR, the PROJECT, and the name of the producer. The accompanying certificate or letter from the CONTRACTOR shall state that the sample complies with contract requirements, shall state the name and brand of the product, its place of origin, the name and address of the producer and all specifications or other detailed information. It should also include a statement that all
materials or equipment furnished for use in the PROJECT shall comply with the samples and/or certified statements.

C. Approval of materials shall be general only and shall not constitute a waiver of the PUBLIC BODY’S right to demand full compliance with the CONTRACT DOCUMENTS. After actual deliveries, the ENGINEER shall have such tests made as he deems necessary and may reject materials, equipment and accessories for cause, even though such materials and equipment have been given general approval. If materials, equipment or accessories which fail check tests have been incorporated into the WORK, the ENGINEER shall have the right to cause their removal, and replacement by proper materials or to secure such preparation by the CONTRACTOR as is equitable.

D. Except as otherwise specifically stated in the CONTRACT DOCUMENTS the costs of sampling and testing will be divided as follows:

(1) The CONTRACTOR shall furnish without extra cost, including packing and delivery charges, all samples required for testing purposes.

(2) The CONTRACTOR shall assume all costs of re-testing materials which fail to meet contract requirements.

(3) The CONTRACTOR shall assume all costs of testing materials offered in substitution for those found deficient.

(4) The PUBLIC BODY will pay all other expenses.

E. If the CONTRACT DOCUMENTS, laws, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested or approved by someone other than the CONTRACTOR or ENGINEER, the CONTRACTOR will give the ENGINEER notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

11. Surveys, Permits, and Codes

A. The PUBLIC BODY shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of benchmarks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the PUBLIC BODY, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slopes, stakes, batter boards, stakes for pipe locations and other working points, lines, elevations and cutsheets.
B. The CONTRACTOR shall carefully preserve benchmarks, reference points and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.

C. Permits and licenses of a temporary nature necessary for prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the CONTRACT DOCUMENTS.

Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the PUBLIC BODY unless otherwise specified.

D. The CONTRACTOR shall give all notices and comply with all applicable laws, ordinances and codes of the appropriate jurisdictions for the WORK as drawn and specified. Before installing any work, the CONTRACTOR shall examine the CONTRACT DOCUMENTS for compliance with applicable ordinances and codes and shall immediately report any discrepancy to the ENGINEER in writing and any necessary changes shall be adjusted as provided for in Section 23, CHANGES IN THE WORK.

Should the CONTRACTOR fail to observe the foregoing provisions and proceed with the WORK or variance with any applicable ordinance or code (Notwithstanding compliance with the CONTRACT DOCUMENTS), the CONTRACTOR shall remove such work without cost to the PUBLIC BODY, and proceed in the manner specified in this section.

E. The CONTRACTOR shall at his own expense secure and pay the appropriate department of the appropriate public authority fees or charges for all permits for street pavement, sidewalks, sheds, removal of abandoned water taps, sealing of house connection drains, pavement cuts, buildings, electrical, plumbing, gas and sewer permits required within the jurisdiction.

F. The CONTRACTOR shall comply with applicable laws, and ordinances governing the disposal of surplus excavation, materials, debris and rubbish on or off the PROJECT and commit no trespass on any public or private property in any operation due to or connected with the WORK.

12. Patents

The CONTRACTOR shall pay all applicable royalties and license fees, and shall defend all suits or claims for infringement of any patent rights, and save the PUBLIC BODY harmless from loss on account thereof, except that the PUBLIC BODY shall be responsible for any such loss when a particular manufacturer is specified, however
if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent the CONTRACTOR shall be responsible for such loss unless the CONTRACTOR promptly gives such information to the ENGINEER.

13. Superintendence by Contractor

A. Except where the CONTRACTOR is an individual and provides personal superintendence to the WORK, the CONTRACTOR shall provide a competent superintendent, satisfactory to the ENGINEER and PUBLIC BODY, on the WORK at all times during working hours with full authority to act. The CONTRACTOR shall also provide adequate personnel for the proper coordination and expediting of his work.

B. The CONTRACTOR will he held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK.

C. The CONTRACTOR shall lay out his own work and he shall be responsible for all work executed by him under the CONTRACT. He shall verify all figures and elevations before proceeding with the WORK and will be held responsible for any error resulting from his failure to do so.

14. Protection of Work, Property and Persons

A. The CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR will take all necessary precautions for the safety of, and will provide the necessary protection: (1) to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby; and, (2) all material and equipment to be incorporated therein, whether in storage on or off the site or adjacent thereof, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities not designated for removal, relocation or replacement during the course of construction.

B. The CONTRACTOR will comply with applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The CONTRACTOR will notify owners of adjacent utilities when prosecution of the WORK may affect them.

The CONTRACTOR will erect and maintain, as required by the conditions and progress of the WORK all necessary safeguards for safety and protection. The CONTRACTOR shall remedy all damage or loss to any property caused directly or indirectly, in whole or part, by the CONTRACTOR, any SUBCONTRACTOR or
anyone directly or indirectly employed by any of them or anyone of whose acts any of them may be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the PUBLIC BODY, of the ENGINEER or anyone employed by either of them or anyone whose acts either of them may be liable, and not attributable, directly or indirectly in whole or in part, to the fault or negligence of the CONTRACTOR.

C. The CONTRACTOR shall shore up, brace, underpin, secure and protect as may be necessary all foundations and other parts of existing structures adjacent to, or in the vicinity of the WORK, which may be affected in any manner by the WORK. The CONTRACTOR shall be responsible for giving any and all required notices to any potentially affected property owner or other affected party prior to commencement of any work.

D. In an emergency affecting the safety of life, limb or property, including adjoining property, the CONTRACTOR, without special instructions or authorization from the PUBLIC BODY, is authorized to act at his discretion to prevent such threatened loss or injury and he shall so act. He shall likewise act if instructed by the PUBLIC BODY or the ENGINEER. Any compensation claimed will be determined by the procedure in Section 23, CHANGES IN THE WORK.

15. Accident Prevention

A. No person employed in the performance of this CONTRACT shall be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous to his health or safety as determined under construction and health standards promulgated by the Secretary of Labor.

B. Machinery, equipment and all site hazards shall be guarded in accordance with the safety provisions of the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, Inc., to the extent that such provisions do not conflict with applicable law.

C. The CONTRACTOR shall maintain an accurate record of all cases of death, occupational disease or injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on this PROJECT.

16. Sanitary Facilities

The CONTRACTOR shall furnish, install and maintain ample sanitary facilities for workers. These facilities shall be sufficient to meet the needs of the PROJECT and be located to the satisfaction of the PUBLIC BODY. All such facilities and services shall be furnished in strict accordance with applicable health regulations.
17. Use of Premises/Storage

A. The CONTRACTOR shall confine his equipment, storage of materials, and construction operations to PROJECT area as shown in the CONTRACT DOCUMENTS and prescribed by ordinances or permits, or as may be desired by the PUBLIC BODY, and shall not unreasonably encumber the PROJECT area or public rights-of-way with his materials and construction equipment.

B. The CONTRACTOR shall consult with the PUBLIC BODY and the ENGINEER for suitable storage space for bulk materials on each project. If sufficient storage is not available on the PROJECT site the CONTRACTOR shall arrange for storage elsewhere.

C. The CONTRACTOR shall comply with all reasonable instructions of the PUBLIC BODY, the ENGINEER, and all applicable regulations regarding signs, advertising, traffic, fires, explosives, danger signals and barricades.

18. Schedules, Reports and Records

A. The CONTRACTOR shall submit to the PUBLIC BODY such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required for the WORK to be performed.

B. Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which the CONTRACTOR proposes to carry out the WORK, including dates at which various parts of the WORK will be started, estimated dates of completion of each part, and as applicable:

(1) The dates at which special detail drawings will be required.

(2) Respective dates for submission of SHOP DRAWINGS, the beginning of manufacturer, testing and the installation of materials, supplies and equipment.

C. The CONTRACTOR shall submit a schedule of payments that the CONTRACTOR anticipates will be earned during the course of the WORK.

D. The PUBLIC BODY, the ENGINEER, their authorized representatives, and authorized representatives of participating state and federal agencies shall have at all times access to the WORK, materials, payrolls, records, personnel, invoices of materials or other relevant data and records. The CONTRACTOR shall provide proper facilities for such access and observation of the WORK and also for any inspection or testing thereof.
19. Inspection

A. All materials and workmanship shall be subject to inspection, examination, or test by the PUBLIC BODY and the ENGINEER of any and all items during manufacture or construction, and at any and all places where such manufacture or construction is carried on. The PUBLIC BODY and ENGINEER shall have the right to reject defective materials and workmanship or require its correction. Unacceptable workmanship shall be satisfactorily corrected.

B. The ENGINEER shall act as the PUBLIC BODY’S representative in carrying out inspection and in assessing the acceptability of all aspects of the WORK in accordance with the CONTRACT DOCUMENTS. The opinions and directives of the ENGINEER concerning the WORK shall be adhered to at all times unless they conflict with the CONTRACT DOCUMENTS or are superseded by the PUBLIC BODY.

C. The CONTRACTOR shall promptly furnish all materials reasonably necessary for any tests which may be required. All tests performed by the ENGINEER will be performed in such a manner as not to delay the WORK unnecessarily and will be made in accordance with the provisions of the CONTRACT DOCUMENTS.

D. The CONTRACTOR shall notify the ENGINEER sufficiently in advance of backfilling or concealing any facilities to permit proper inspection. If any facilities are concealed without approval of the ENGINEER, the CONTRACTOR shall uncover for inspection and re-cover such facilities all at his Ohm expense.

E. Should the PUBLIC BODY consider it necessary at any time prior to final acceptance of the WORK to examine any work already approved and completed, the CONTRACTOR shall on request promptly furnish all necessary facilities, labor and material. If such work is found to be defective due to the fault of the CONTRACTOR or his SUBCONTRACTORS, the CONTRACTOR shall defray the cost of such re-examination and of satisfactory reconstruction.

If such work is found to be acceptable according to the CONTRACT DOCUMENTS, the actual cost of such re-examination in labor and materials, plus 15% of such costs to cover general expenses shall be allowed the CONTRACTOR, and if such re-examination has delayed the WORK to a significant degree he shall be allowed a commensurate time extension.

20. Payments to Contractor

A. Partial Payments
(1) The CONTRACTOR shall prepare his requisition for partial payment as of the last day of the month (unless the payment schedule is tied to milestone, in such case requisition is prepared at appropriate stage of completion) and submit it with the required number of copies to the ENGINEER for his approval. The amount of the payment due the CONTRACTOR shall be determined by adding the total value of the work completed to date to the value of the materials properly stored at the site, and deducting (a) five percent (5%) of the total amount to be retained until final payment, (b) the amount of all previous payments, and, (c) such claims as may be specifically excepted by the CONTRACTOR as provided for in Section 48 hereof. The total value of work completed to date shall be based upon the estimated quantities of work completed and on the unit prices contained in the agreement; mobilization costs shall not be included. The value of the materials properly stored on site shall be based upon the estimated quantities of such materials and the invoice prices. Copies of all invoices shall be available for inspection by the ENGINEER.

(2) The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing approval of payment and submit the partial payment estimate to the PUBLIC BODY, or return the partial payment estimate to the CONTRACTOR indicating in writing the reason for refusing to approve payment. In such case the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The PUBLIC BODY will within thirty (30) days of presentation of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment.

(3) Monthly or partial payments made by the PUBLIC BODY to the CONTRACTOR are moneys advanced for the purpose of assisting the CONTRACTOR to expedite the WORK. The CONTRACTOR shall be responsible for the care and protection of all materials and work upon which such payments have been made until final acceptance of the PROJECT by the PUBLIC BODY. Such payments shall not constitute a waiver of the right of the PUBLIC BODY to require the fulfillment of all terms of the CONTRACT DOCUMENTS and all improvement embraced therein to the satisfaction of the PUBLIC BODY.

B. Final Payment

(1) After final inspection and acceptance by the PUBLIC BODY of all WORK according to the CONTRACT DOCUMENTS, the CONTRACTOR shall prepare his requisition for final payment which shall be based upon the carefully measured or computed quantity of each item of work and the applicable unit prices stipulated in the CONTRACT DOCUMENTS. The total amount of the final payment due the CONTRACTOR under this CONTRACT shall be the amount computed as described above less all previous payments. Final
payment shall be made subject to the CONTRACTOR furnishing the PUBLIC BODY with a release in satisfactory form of all claims against the PUBLIC BODY arising under and by virtue of the CONTRACT DOCUMENTS, other than such claims as may be specifically excepted by the CONTRACTOR from the operation of the release as provided for under Section 48, CONTRACTUAL DISPUTES.

(2) If a lump sum CONTRACT price is in effect the following wording is operative "The amount of the final payment due the CONTRACTOR shall be the lump sum shown in the CONTRACT DOCUMENTS or this sum as adjusted by approved CHANGE ORDERS.

(3) The PUBLIC BODY, before paying the final payment, may require the CONTRACTOR to furnish releases or receipts from all SUBCONTRACTORS having performed any work and all persons having supplied materials, equipment and services to the CONTRACTOR, if the PUBLIC BODY deems the same necessary in order to protect its interests. The PUBLIC BODY may if it deems it advisable make payment to the CONTRACTOR in part or in full without requiring the furnishing of such releases or receipts, and any payments so made shall in no way impair the obligations of any surety furnished under the terms of the CONTRACT DOCUMENTS.

(4) Any amount withheld by the PUBLIC BODY as "Liquidated Damages" under the terms of the CONTRACT DOCUMENTS shall be deducted from the final payment due the CONTRACTOR.

(5) Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate to be attached to the final payment request that the WORK has been accepted under the conditions of the CONTRACT DOCUMENTS. The entire amount due the CONTRACTOR as described in provisions of this section shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK. If the PUBLIC BODY fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment, interest of the maximum legal rate commencing on the first day after said payment is due and continuing until payment is received by the CONTRACTOR.

C. Acceptance of Final Payment

The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the PUBLIC BODY of all claims and all liability to the CONTRACTOR other than claims in stated amounts which may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the PUBLIC BODY and others relating to or arising out
of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or its sureties from any obligations under the CONTRACT DOCUMENTS or the Performance or Payment BONDS.

21. Payments by Contractor

Except in cases of bona fide disputes, or where the CONTRACTOR has some other justifiable reason for delay, the CONTRACTOR shall pay:

A. For all transportation and utility services not later than the end of the calendar month following that in which the services are rendered.

B. For all materials, tools and other expendable equipment to the extend of ninety percent (90%) of the cost thereof not later than the end of the calendar month following that in which such materials, tools and equipment are delivered at the site of the PROJECT.

C. To each of his SUBCONTRACTORS, not later than the end of the calendar month in which each payment is made to the CONTRACTOR, the representative amount allowed the CONTRACTOR on account of the work performed by his SUBCONTRACTORS, to the extent of each SUBCONTRACTOR'S interest therein.

22. Public Body's Use of Premises

A. Prior to SUBSTANTIAL COMPLETION, the PUBLIC BODY with the concurrence of the ENGINEER and the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

B. The PUBLIC BODY shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the PUBLIC BODY.

23. Changes in The Work

A. The PUBLIC BODY may make changes in the WORK required to be performed by the CONTRACTOR under the CONTRACT DOCUMENTS without releasing the CONTRACTOR from any of his obligations under the CONTRACT DOCUMENTS or any guarantee given by him pursuant to the CONTRACT provisions, and without affecting the validity of the guaranty BONDS, and without relieving or releasing the
surety or sureties of said BONDS. All WORK shall be executed under the terms of the original CONTRACT DOCUMENTS unless it is expressly provided otherwise. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER. All change Orders must be approved by the Virginia Department of Housing and Community Development (DHCD) and may not alter the scope of the project. DHCD must receive justification for Change Orders from the grantee.

B. Except for the purpose of affording protection against any emergency endangering health, life, limb or property as specified in Section 14, the CONTRACTOR shall make no change in the WORK as specified in the CONTRACT DOCUMENTS unless in pursuance of a written approved CHANGE ORDER from the PUBLIC BODY authorizing the CONTRACTOR to proceed with the change. No claim for an adjustment of the CONTRACT PRICE or time will be valid unless so ordered.

C. If applicable unit prices are contained in the CONTRACT DOCUMENTS, the PUBLIC BODY may order the CONTRACTOR to proceed with the applicable unit prices specified in the CONTRACT DOCUMENTS; provided that in the case of a unit price contract the net value of all changes does not increase or decrease the original total amount shown in the CONTRACT DOCUMENTS by more than twenty five percent (25%).

D. If the applicable unit prices are not contained in the CONTRACT DOCUMENTS or if the total net change increases or decreases the total CONTRACT PRICE more than twenty five percent (25%), or $10,000 (whichever is greater) the PUBLIC BODY shall, before ordering the CONTRACTOR to proceed with the desired changes, request from him an itemized proposal covering the WORK involved in the change after which the procedure shall be as follows:

(1) If the proposal is acceptable the PUBLIC BODY will prepare the CHANGE ORDER in accordance therewith for acceptance by the CONTRACTOR.

(2) If the proposal is not acceptable, the PUBLIC BODY shall order the WORK change to be commenced and the CONTRACTOR and PUBLIC BODY shall follow the procedure detailed in Section 48, Contractual Disputes.

E. Each CHANGE ORDER shall include in its final form:

(1) A detailed description of the change in the WORK

(2) The CONTRACTOR’S proposal (if any) or a confirmed copy thereof
(3) A definite statement as to the resulting change in the CONTRACT PRICE or TIME

(4) The statement that all WORK involved in the change shall be performed in accordance with the CONTRACT DOCUMENTS except as modified by the CHANGE ORDER.

F. The procedures as outlined in this section for a unit price CONTRACT also apply in the case of a lump sum CONTRACT.

G. The ENGINEER also, may at any time, by issuing a FIELD ORDER make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles the CONTRACTOR to a change in CONTRACT PRICE or TIME, or both, in which event the CONTRACTOR shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of such ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instructions from the PUBLIC BODY.

H. All change orders must be approved in writing and in advance of any associated work performance by DHCD. Any change order, regardless of the cost, which results in a change in project scope will be disallowed.

24. Claims for Extra Cost/Subsurface Conditions

A. Should the CONTRACTOR claim that any instructions by DRAWINGS or otherwise entitles him to a change in CONTRACT PRICE or TIME he shall follow the procedures in SECTION 23.

B. Claims for additional compensation for extra work, due to alleged errors in ground elevations, contour lines or bench marks, will not be recognized unless accompanied by certified survey data made prior to the time the original ground was disturbed, clearly showing that errors exist which result in handling more material, or performing more work, than could be reasonably estimated from the CONTRACT DOCUMENTS.

C. Any discrepancies which may be discovered between the actual conditions and those represented by the CONTRACT DOCUMENTS shall at once be reported to the PUBLIC BODY and work shall not proceed except at the CONTRACTOR’ S risk until written instructions have been issued by the PUBLIC BODY.
D. The PUBLIC BODY shall promptly investigate the conditions, and if it is found that such conditions do so materially differ from those upon which the CONTRACT DOCUMENTS are based, and cause an increase or decrease in the cost of, or time required for, performance of the WORK an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER.

Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless required WRITTEN NOTICE has been given; provided that the PUBLIC BODY may, if it determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

25. Time for Completion and Liquidated Damages

A. The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on the date specified in the NOTICE TO PROCEED.

B. The CONTRACTOR will proceed with the WORK at such rate of PROGRESS to insure full completion within the CONTRACT TIME. It is expressly understood and agreed by and between the CONTRACTOR and the PUBLIC BODY that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

C. Liquidated Damages for Delays

If the WORK is not completed within the time stipulated in the CONTRACT DOCUMENTS including any extensions of time for excusable delays as herein provided, the CONTRACTOR shall pay to the PUBLIC BODY as fixed, agreed and liquidated damages for each calendar day of delay, until the WORK is completed, the amount set forth in the CONTRACT DOCUMENTS hereof and the CONTRACTOR and his sureties shall be liable to the PUBLIC BODY for the amount thereof. These fixed, agreed and liquidated damages are being set for delay because fixing actual damages for delay is impractical and extremely difficult.

The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the PUBLIC BODY and the ENGINEER:

(1) To any preference, priority or allocation order duly issued by the PUBLIC BODY.
(2) To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the PUBLIC BODY, acts of another CONTRACTOR in the performance of a contract with the PUBLIC BODY, fires, floods, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather, and

(3) To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs C.(1) and C.(2) of this Section.

The aforementioned exemptions from payment of liquidated damages shall apply only if the CONTRACTOR promptly notifies the PUBLIC BODY within ten (10) days with WRITTEN NOTICE documenting the cause of such delay.

Upon receipt of such NOTICE the PUBLIC BODY shall ascertain the facts and the cause and the extent of such delay. If upon the basis of the facts and the terms of the CONTRACT DOCUMENTS, the delay is properly excusable, the PUBLIC BODY shall extend the CONTRACT TIME for completion of the WORK for a period commensurate with the period of excusable delay.

26. Suspension of Work, Termination And Delay

A. The PUBLIC BODY may suspend the WORK or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the CONTRACTOR by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which shall fix the date on which the WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

B. If the CONTRACTOR is adjudged bankrupt or insolvent, or makes a general assignment for the benefit of its creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of its property or if the CONTRACTOR files a petition to take advantage of any debtor’s act, or to reorganize under the bankruptcy or applicable laws, or repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment, or disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK, or disregards the authority of the ENGINEER, or otherwise violates any provision of the CONTRACT DOCUMENTS, then the PUBLIC BODY may, without prejudice to any other right or remedy and after giving the CONTRACTOR and its surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate services of the CONTRACTOR and take possession of the PROJECT and all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR and finish the WORK by whatever method the PUBLIC
BODY may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess shall be paid to the CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the PUBLIC BODY. Such costs incurred by the PUBLIC BODY will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

C. Where the CONTRACTOR’S services have been so terminated by the PUBLIC BODY, said termination shall not affect any right of the PUBLIC BODY against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the PUBLIC BODY due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

D. After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the PUBLIC BODY may, without cause or prejudice to any other right or remedy, elect to abandon the PROJECT and to terminate the CONTRACT. In such case the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

E. If through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the PUBLIC BODY or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the PUBLIC BODY fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded through the legally recognized disputed claim procedure within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the PUBLIC BODY terminate the CONTRACT and recover from the PUBLIC BODY payment for all WORK executed and expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the PUBLIC BODY has failed to make any payment as foresaid, the CONTRACTOR may upon ten (10) days WRITTEN NOTICE to the PUBLIC BODY and ENGINEER stop the WORK until all amounts then due are paid, in which event and upon resumption of the WORK CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME, or both, to compensate for the costs and delays attributable to the stoppage of the WORK.

F. If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of the PUBLIC BODY or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the
CONTRACTOR for the Costs and delays necessarily caused by the failure of the PUBLIC BODY or ENGINEER.

27. Correction of Work

A. The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the PUBLIC BODY and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

B. All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the PUBLIC BODY may remove such WORK and store the materials at the expense of the CONTRACTOR.

C. If the PUBLIC BODY deems if not expedient to require the CONTRACTOR to correct WORK not done in accordance with the CONTRACT DOCUMENTS, an agreement may be made between the PUBLIC BODY and the CONTRACTOR for a change in CONTRACT PRICE with an equitable deduction in lieu of replacement and removal.

28. Cleanup Requirements

A. The construction premises, job sites and any property leased for storage of equipment or materials shall be maintained by the CONTRACTOR in reasonably neat and orderly condition, free from accumulation of waste material and rubbish during the entire construction period. All crates, cartons and other flammable and trash shall be removed from work areas at the end of each working day. Trash burning on the site shall be prohibited unless done in accordance with local ordinance.

B. The CONTRACTOR shall remove all rubbish and debris from WORK with reasonable promptness. Rubbish and debris shall not be permitted to accumulate in excessive amounts that will become hazardous underfoot and to vehicular traffic.

C. Upon completion of the WORK, the CONTRACTOR shall remove all temporary construction facilities, including buildings, fences, scaffolding, unused materials; and rubbish of any kind. Buildings, job site and adjacent property shall be left in a neat and clean condition acceptable to the PUBLIC BODY.
29. **Fitting and Coordination of the Work**

The CONTRACTOR shall be responsible for the proper fitting of all WORK and for the coordination of the operation of all trades, SUBCONTRACTORS, or material supplies engaged in the WORK. The CONTRACTOR shall guarantee to each of his SUBCONTRACTORS the locations and measurements which they may require for the fitting of their work to all surrounding work.

30. **Subcontracting**

A. The CONTRACTOR may utilize specialty SUBCONTRACTS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.

B. The CONTRACTOR shall not contract with any proposed SUBCONTRACTOR without the prior written approval of the PUBLIC BODY. Prior to the award of each SUBCONTRACT, the CONTRACTOR shall notify the PUBLIC BODY and the ENGINEER in writing of the name and trade of each SUBCONTRACTOR proposed, and furnish such written information as the PUBLIC BODY and the ENGINEER may require concerning the proposed SUBCONTRACTOR. Any objection the PUBLIC BODY may have concerning the proposed SUBCONTRACT shall be expressed in writing within seven (7) days after receipt by the PUBLIC BODY of the CONTRACTOR’S proposal of a SUBCONTRACT.

C. The PUBLIC BODY may, without claim for extra cost by the CONTRACTOR, disapprove of any SUBCONTRACTOR based upon its own determination, or because of the fact that the proposed SUBCONTRACTOR is listed as ineligible to receive award of CONTRACTS for federally funded jobs due to being listed as debarred by the U. S. Department of Housing and Urban Development, the U. S. Department of Labor, or the Commonwealth of Virginia.

D. The CONTRACTOR shall be as fully responsible for the acts and omissions of its SUBCONTRACTORS, and for persons either directly or indirectly employed by them, as the CONTRACTOR is for the acts and omissions of persons employed by the CONTRACTOR.

E. The CONTRACTOR shall cause appropriate provisions to be inserted in all SUBCONTRACTS relative to the WORK to bind SUBCONTRACTORS to applicable provisions of the CONTRACT DOCUMENTS.

F. There shall be nothing contained in the CONTRACT DOCUMENTS that shall create any contractual relation between any SUBCONTRACTOR and the PUBLIC BODY.
31. Separate Contracts

A. The PUBLIC BODY reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate the WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends on the work of any other contractors, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defect in such work that render it unsuitable for such proper execution and results.

B. The PUBLIC BODY may perform additional work related to this PROJECT or the PUBLIC BODY may let other contracts containing provisions similar to these. The CONTRACTOR shall afford the other contractors who are parties to such contracts (or the PUBLIC BODY if the PUBLIC BODY is performing the additional work) reasonable opportunity for the introduction and storage of equipment and materials and the execution of work, and shall properly connect and coordinate the WORK with theirs.

C. If the performance of additional work by other contractors or the PUBLIC BODY is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional work. If the CONTRACTOR believes that the performance of such additional work by the PUBLIC BODY entitles him to an extension of CONTRACT TIME, the CONTRACTOR may make a claim thereof for a CHANGE ORDER.

32. Lands and Rights-Of-Way

A. Prior to issuance of NOTICE TO PROCEED the PUBLIC BODY shall obtain all land and rights-of-way necessary for carrying out and for completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

B. The PUBLIC BODY shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

33. As Constructed Drawings

The CONTRACTOR shall provide the ENGINEER with accurate information to be used in the preparation of permanent As Constructed Drawings. For this purpose, the CONTRACTOR shall record on one set of CONTRACT DRAWINGS all changes from the installations originally indicated, and record final locations of underground lines by
depth from finish grade and by accurate horizontal offset distances to permanent surface improvements such as buildings, curbs, or edges of walks etc.

34. Final Completion Inspection and Closeout

A. When the WORK as described in the CONTRACT DOCUMENTS is substantially completed, the CONTRACTOR shall notify the ENGINEER and PUBLIC BODY by WRITTEN NOTICE that the WORK will be ready for final inspection on a definite date specified in such NOTICE. The WRITTEN NOTICE shall be given at least ten (10) days prior to the date stated for final inspection. If the PUBLIC BODY determines that the status of the WORK is as represented, it will make arrangements necessary to conduct final inspection on the date stated in the NOTICE, or as soon thereafter as is practicable. The inspection party will include the ENGINEER and such representatives of the PUBLIC BODY as deemed appropriate.

B. After the ENGINEER and the PUBLIC BODY have been satisfied that the CONTRACTOR has performed satisfactorily in accordance with the CONTRACT DOCUMENTS, the ENGINEER will certify that the CONTRACTOR is eligible for final payment by the PUBLIC BODY.

C. The CONTRACTOR is required to execute a Release of Liens, Payment in Full to Subcontractors and Material Suppliers Certification, Warranty of Materials and Workmanship and all other appropriate documents that are essential to close out of the PROJECT as requested by the PUBLIC BODY.

D. The PUBLIC BODY'S attorney will review the CONTRACTOR'S close out documents prior to acceptance by the PUBLIC BODY. If the PUBLIC BODY and its attorney are satisfied that the PUBLIC BODY is released from all liens, claims or other charges connected with the WORK, the PUBLIC BODY will make payment to the CONTRACTOR.

35. Insurance

A. The CONTRACTOR shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of, or result from, the CONTRACTOR'S execution of the WORK, whether such execution be by the CONTRACTOR, any SUBCONTRACTOR, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

(1) Claims under workmen's compensation, disability benefit and other similar employee benefit acts;
(2) Claims for damages because of bodily injury, occupational sickness or disease, or death of employees;

(3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than employees;

(4) Claims for damages insured by usual personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (b) by any other person; and

(5) Claims for damages because of injury to or destruction of tangible property, including loss of use resulting there from.

B. Certificates of Insurance acceptable to the PUBLIC BODY shall be filed with the PUBLIC BODY prior to commencement of the WORK. These Certificates shall contain a provision that coverage afforded under the policies will not be cancelled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the PUBLIC BODY.

C. The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, Liability insurance as herein-after specified:

(1) Contractor's General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting the CONTRACTOR from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by the CONTRACTOR or by any SUBCONTRACTOR employed by the CONTRACTOR or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR employed by the CONTRACTOR. Insurance shall be written with a limit of liability of not less than $500,000 for all damages arising out of bodily injury, including death, at any time resulting there from, sustained by anyone person in any one accident; and a limit of liability of not less than $500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $200,000 aggregate for any such damage sustained by two or more persons in any accident.

(2) The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the PUBLIC BODY, the CONTRACTOR, and
SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

D. The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, in accordance with the provisions of State law, Workman's Compensation Insurance, including occupational disease provisions, for all of the CONTRACTOR'S employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site for the PROJECT is not protected under Workmen's Compensation statue, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of its employees not otherwise protected.

E. The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the PUBLIC BODY, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the PUBLIC BODY. The policy shall name as the insured the CONTRACTOR, and the PUBLIC BODY.

36. Assignment of Contract

A. The CONTRACTOR' S obligations and duties under this CONTRACT shall not be assigned in whole or in part by the CONTRACTOR without the prior written approval of the PUBLIC BODY. This shall not prohibit the assignment of the proceeds due hereunder to a bank or financial institution, provided however that such assignment does not encumber or in any way lay claim to materials, equipment or machinery to be incorporated into the WORK or otherwise to be vested in the PUBLIC BODY by terms of the CONTRACT DOCUMENTS. This provision shall not preclude the CONTRACTOR from subletting as provided in the CONTRACT DOCUMENTS, parts of the WORK.

B. This CONTRACT may be assigned by the PUBLIC BODY to any corporation, agency, or instrumentally authorized to accept such assignment.
37. **Indemnification**

A. The CONTRACTOR will indemnify and hold harmless the PUBLIC BODY and the ENGINEER and their agents and employees from and against all claims, damages, losses, and expenses including attorney fees arising out of or resulting from the performance of the WORK, provided that such claims, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use thereof; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

B. In any and all claims against the PUBLIC BODY or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, of benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or any other employee benefit acts.

C. The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, its agents, or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

38. **Guarantee**

The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of substantial inspection. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of final inspection of the facility that the facility is free from all defects due to faulty materials and workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of the damages of other parts of the system resulting from such defects. The PUBLIC BODY will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments or other WORK that may be made necessary by such defects, the PUBLIC BODY may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.
39. Notices

A. All NOTICES, demands, requests, instructions, approvals, proposals, and claims must be made in writing.

B. Any NOTICE to or demand upon the CONTRACTOR shall be sufficiently given if delivered at the office of the CONTRACTOR stated on the signature page of the CONTRACT DOCUMENTS (or at such other office as he may from time to time designate in writing to the PUBLIC BODY, or deposited in the United States Mail in a sealed, postage paid envelope, or if delivered with charges prepaid to any telegraph company for transmission in each case addressed to such office).

C. All NOTICES required to be delivered to the PUBLIC BODY shall, unless otherwise specified in writing to the CONTRACTOR, be delivered to the designated representative and any NOTICE to or demand upon the PUBLIC BODY shall be sufficiently given if so delivered in writing, or deposited in the United States Mail in a sealed, postage paid envelope, or delivered with charges prepaid to any telegraph company for transmission to said designated representative at such address, or to such other address as the PUBLIC BODY may subsequently specify in writing to the CONTRACTOR for such purposes.

D. Any such WRITTEN NOTICE shall be deemed to have been given as of the time of actual delivery, or in the case of mailing, when the same should have been received in due course of post, or in the case of telegrams at the time of actual receipt, as the case may be.

40. Access to Records

The PUBLIC BODY, the Inspector General of the United States, U. S. Department of Housing and Urban Development, U. S. Department of Labor, the General Accounting Office, and DHCD shall be permitted by the CONTRACTOR to have full access to, and right to examine any pertinent books, documents, papers and records of the CONTRACTOR involving transactions related to this CONTRACT, during the period of this PROJECT and for five (5) years from the date of final payment or until all findings have been resolved to the satisfaction of the Commonwealth of Virginia. The CONTRACTOR agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed. The CONTRACTOR agrees to maintain all books, documents, papers and records required under this CONTRACT for a period of not less than five (5) years from the date of final payment or until all findings have been resolved to the satisfaction of the Commonwealth of Virginia.
41. Withholding Of Funds

Not withstanding the provisions of Section 20 herein, the following shall apply:

A. The PUBLIC BODY may withhold or cause to be withheld from the CONTRACTOR so much of the accrued payments or advances as may be considered necessary to satisfy any liability of the CONTRACTOR or any SUBCONTRACTOR for liquidated damages under the CONTRACT Work Hours and Safety Standards Act - Overtime Compensation.

B. If the CONTRACTOR or any SUBCONTRACTOR fails to pay any laborer, mechanic, apprentice, trainee, watchman or guard employed on the WORK all or part of the wages required by the CONTRACT DOCUMENTS, the PUBLIC BODY may, upon WRITTEN NOTICE to the CONTRACTOR, take such action as may be necessary to cause suspension of any further payments or advances until such violations have ceased.

42. Federal Funding Termination

In the event that federal funding is terminated or otherwise unavailable for the purpose of compensating the CONTRACTOR, the CONTRACT is null and void, releasing the CONTRACTOR from further obligations contained therein.

43. Interest of Contractor

The CONTRACTOR covenants that the CONTRACTOR presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the CONTRACTOR'S services hereunder. The CONTRACTOR further covenants that in the performance of this CONTRACT no person having any such interest shall be employed.

44. Political Activity

No portion of CONTRACT funds shall be directly used for any political activity or to further the election or defeat of any candidate for public office.

45. Interest of Officials

A. No member of or delegate to the Congress of the United States, shall be admitted to any share or part of this CONTRACT or to any benefit to arise there from; but this
provision shall not be construed to extend to this CONTRACT if made with a corporation for its general benefit.

B. No employee, officer or agent of the PUBLIC BODY shall participate in selection, or in the award or administration of this CONTRACT if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: the employee, officer or agent; any member of his immediate family; his partner; or an organization which employs or is about to employ any of the preceding persons has a financial or other interest in the CONTRACTOR or this CONTRACT.

46. Provisions Required By Law Deem Inserted

Each and every provision of law and clause required by law to be inserted in this CONTRACT shall be deemed to be inserted herein and the CONTRACT shall be read and enforced as though it were included herein.

47. Contract Security

Requirements: Section 2.2-4337 of the Virginia Public Procurement Act requires performance and payment bonds in the amount of the contract for construction contracts exceeding $500,000 awarded to any prime contractor. State law does not preclude public bodies from requiring such bonds for construction contracts below $500,000. Section 2.2-4337 also allows the contractor to require of each subcontractor a payment bond (but not a performance bond). HUD regulations at 24 CFR Part 85 requires performance and payment bonds for 100 percent of the contract price for contracts exceeding $150,000 and such bonds must be obtained from companies listed in the U.S. Treasury Circular 570.

NOTE: The public body must use the sample wording or develop its own wording consistent with the requirements.

Sample

A. Simultaneous with the delivery of the executed CONTRACT, the CONTRACTOR shall furnish to the PUBLIC BODY the following BONDS payable to the PUBLIC BODY:

1. A performance BOND in the sum of the CONTRACT amount conditioned upon the faithful performance of the CONTRACT in strict conformity with the CONTRACT DOCUMENTS.

2. A payment BOND in the sum of the CONTRACT amount. Such BOND shall be for the protection of claimants who have and fulfill contracts to supply labor or materials to the CONTRACTOR, or to any of his SUBCONTRACTORS, in
the prosecution of the WORK, and shall be conditioned upon the prompt payment for all such material furnished or labor supplied or performed in the prosecution of the WORK. "Labor or materials" shall include public utility services and reasonable rental of equipment, but only for periods when the equipment rented is actually used at the site.

B. Each of the BONDS shall be executed by one or more surety companies authorized to do business in Virginia. When the CONTRACT amount exceeds $150,000, such company shall also be listed in the latest issue of the U.S. Treasury Circular 570 and the penal sum shall be within the maximum specified for such company in said Circular 570.

C. In lieu of a payment or performance BOND, the CONTRACTOR may furnish a certified check or cash escrow in the face amount required by the BOND.

48. Contractual Disputes

Requirements: Section 2.2-4363 of the Virginia Public Procurement Act requires public bodies to include in their contracts (or by reference) a procedure for consideration of contractual claims. Such procedure must establish a time limit for a final decision in writing by the public body. OMB Part 85 provides that "The grantee is responsible, in accordance with good administrative practice and sound business judgment, for the settlement of all contractual and administrative issues arising out of procurements entered in support of a grant. These include but are not limited to source evaluation, protests, disputes, and claims." As a minimum, ALL PUBLIC BODIES MUST ESTABLISH a procedure for consideration of contractual claims including a time limit for a final decision. TWO EXCEPTIONS MUST BE PROVIDED for in a general contractual disputes clause. These exceptions concern disputes arising out of the labor standards provisions of the contract and disputes relative to a contractor's compliance with the affirmative action clauses.

Sample

A. Contractual claims whether for money or other relief, except disputes arising out of the Labor Standards Provisions of this CONTRACT and disputes relative to the CONTRACTOR' S compliance with the affirmative action clauses shall be submitted in writing no later than sixty (60) days after final payment, however, WRITTEN NOTICE of the CONTRACTOR'S intention to file such a claim must be given at the time of the occurrence or prior to beginning of that part of the WORK upon which the claim is based. Such WRITTEN NOTICE of the CONTRACTOR'S intention to file a claim need not detail the amount of the claim, but shall state the facts or issues relating to the claim in sufficient detail to identify the claim, together with its character and scope. Upon the filing of such WRITTEN NOTICE the CONTRACTOR shall proceed with the WORK as directed.
B. The PUBLIC BODY, upon receipt of a detailed claim, may at any time render its decision and shall render such decision within days of final payment. Each such decision rendered by the PUBLIC BODY shall be forwarded to the CONTRACTOR by WRITTEN NOTICE.

C. If the CONTRACTOR disagrees with the decision of the PUBLIC BODY concerning any pending claim he shall promptly notify the PUBLIC BODY by WRITTEN NOTICE that he is proceeding with the WORK under protest. Any claim not resolved, whether by failure of the CONTRACTOR to accept the decision of the PUBLIC BODY or under a WRITTEN NOTICE of CONTRACTOR'S intention to file a claim or a detailed claim not acted upon by the PUBLIC BODY, shall be specifically exempt by the CONTRACTOR from payment request, whether progress or final. Pendency of claims shall not delay payment of amounts agreed due in the final payment.

D. The decision on contractual claims by the PUBLIC BODY shall be final and conclusive unless the CONTRACTOR appeals within six months of the date of the final decision on the claim by the PUBLIC BODY by invoking the administrative appeals procedure, if available, or by instituting legal action in the appropriate circuit court.

49. Administrative Appeals Procedure and Arbitration

Requirements: Under Section 2.2-4365 of the Virginia Public Procurement Act, a public body may establish an administrative appeals procedure for hearing protests of a decision to award or an award, appeals from refusals to allow withdrawal of bids, appeals from disqualifications and determinations of nonresponsibility, and appeals from decisions on disputes arising during the performance of a contract. And such administrative procedure shall provide for a hearing before a disinterested person or panel.

The sample administrative appeals procedure is optional.

Sample:

A. Not later than six months from the date of the decision of the PUBLIC BODY, the CONTRACTOR may invoke the Administrative Appeals Procedure, by filing with the PUBLIC BODY a WRITTEN NOTICE of an intention to arbitrate, which NOTICE shall contain a statement setting forth the nature of the dispute, the amount involved, and the remedy sought. The CONTRACTOR shall file two copies of said NOTICE with any Regional Office of the American Arbitration Association (AAA), together with two copies of the arbitration provisions of this CONTRACT and the appropriate filing fee as provided for in the administrative fee schedule of the AAA in
effect at the time of filing. Such dispute shall be settled in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association.

B. The award shall be final and conclusive and shall not be set aside unless the findings of fact contained therein are fraudulent or arbitrary or capricious, or so grossly erroneous as to imply bad faith.

C. No determination on an issue of law shall be final if appropriate legal action is instituted in a timely manner. Any party to the Administrative Appeals Procedure shall be entitled to institute judicial review if such action is brought within thirty (30) days of the receipt of the written decision.

D. Judgment upon the award may be entered in any court having jurisdiction thereof.

E. Should the Administrative Appeals Procedure be invoked prior to completion of the WORK, the CONTRACTOR shall carry on the WORK and maintain the progress schedule unless otherwise agreed to by the CONTRACTOR and the PUBLIC BODY in writing.

50. Other Contractual Requirements

RETAINAGE: Section 2.2-4333 of the Virginia Public Procurement Act provides, "In any public contract for construction which provides for progress payments in installments based upon an estimated percentage of completion, the contractor shall be paid at least ninety-five percent of the earned sum when payment is due, with not more than five percent being retained to assure faithful performance of the contract. All amounts withheld may be included in the final payment... Any subcontract for a public project which provides for similar progress payments shall be subject to the same limitations."

There are no federal requirements addressing the retainage issues.

NOTE: The maximum five percent retainage allowable is incorporated in Section 20 of General Conditions - Part I.

EQUALS: Both 24 CFR Part 85 and Section 2.2-4315 of the Virginia Public Procurement Act require that in contracts the use of a certain brand, make or manufacture does not restrict the procurement to a specific brand, make or manufacturer. This requirement is found in Section 4 of General Conditions - Part I.

RECORDS RETENTION AND ACCESS TO: The federal requirements concerning retention of records and access to records and incorporated in Section 40 of General Conditions - Part I.
CONTRACT TERMINATION: The 24 CFR Part 85 requirements concerning contract termination are incorporated in the language found in Section 26 of General Conditions - Part I.
General Conditions - Part II

(TO BE INSERTED VERBATIM IN ALL CDBG CONSTRUCTION CONTRACTS; Except Subpart A, Federal Labor Standards Provisions; and Subpart B, Contract Work hours and Safety Standards Act, do not apply to rehabilitation of residential property, including bathroom additions, for use by less than eight families)


29 CFR 5.5 (a) - APPLICABILITY

The Project or Program to which the work covered by this Contract pertains is being assisted by the United States of America, and the following Federal Labor Standards Provisions are included in this contract pursuant to the provisions applicable to such Federal assistance.

(Applicable to all contracts/subcontracts in excess of $2,000)

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 each 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 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 l(d) of this subpart; 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 of 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 classification and wage rates conformed under paragraph l(b) of this subpart) 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 Virginia Department of Housing and Community Development (DHCD) and the Public Body shall require that any class of laborers or mechanics 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. DHCD and the U.S. Department of Labor 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 DHCD 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 DHCD to the Administrator of the Wage and Hour Division, Employment Standards Administration, U. S. Department of Labor, in Washington D. C. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise DHCD, or will notify DHCD 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), DHCD shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise DHCD or will notify DHCD within the 30-day period that additional time is necessary.
(4) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs 1 (b) (B) or (C) of this subpart, 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 payment 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

DHCD, or the Public Body, 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, DHCD may, after written notice to the contractor, sponsor, applicant, or owner, 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)(l)(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 l(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.

A.

(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the designated Public Body. 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). This information may be submitted in any form desired. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

(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 maintained under 29 CFR 5.5(a)(3)(i), 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) (B) of this subpart.
(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.

B. The contractor or subcontractor shall make the records required under paragraphs 3(a) of this subpart available for inspection, copying, or transcription by authorized representatives of the Public Body, DHCD or the U.S. 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 Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, 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: 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, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, 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 Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ratio permitted to the contractor as to his 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 rate 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 not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman 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 determined that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Employment and Training Administration, or a State Apprenticeship Agency recognized by the Bureau, 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: 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 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 his 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 that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the wage rate determined by the Secretary of Labor for the classification of work he 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.

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 in any subcontract the clauses contained in 29 CFR 5.5(a) (1) through (12) and such other clauses as the Department of Housing and Community Development may by appropriate instruction require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontract. 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 which 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).

11. **Employment of Certain Persons Prohibited**

No person under the age of sixteen years and no person who, at the time, is serving sentence in a penal or correctional institution shall be employed on the work covered by this Contract.

12. **Questions Concerning Certain Federal Statutes and Regulations**

All questions arising under this Contract not specifically addressed in the above paragraphs which relate to the application or interpretation of (a) the aforesaid Anti-Kickback Act, (b) the Contract Work Hours and Safety Standards Act, (c) the aforesaid Davis-Bacon Act, (d) the regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to said Acts, or (e) the labor standards provisions of any other pertinent Federal statute, shall be referred, through the Public Body to the Virginia Department of Housing and Community Development, to the Secretary of Labor, United States Department of Labor, for said Secretary's appropriate ruling or interpretation which shall be authoritative and may be relied upon for the purposes of this Contract.

**Subpart B: Contract Work Hours And Safety Standards Act**

(Applicable to all construction contracts. As used in this "Subpart" the terms "laborers" and "mechanics" include watchman 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 plus the straight-time rate of any required fringe benefits 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 subpart, the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States 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 subpart, in the sum of $10 for each calendar day or 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 subpart.

3. **Withholding For Unpaid Wages and Liquidated Damages**

The Public Body or DHCD 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 subpart.

4. **Subcontract**

The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) of this subpart and also a clause requiring the subcontractors to include these clauses in any lower tier subcontract. 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 subpart.

In addition to the clauses contained in Subpart B, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statues cites in 5.1, the Agency Head shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under Subpart B shall be made available by the contractor or subcontractor for inspection, copying, or
transcription by authorized representative of the Public Body, DHCD and/or the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

Subpart C: Equal Employment Opportunity

1. Executive Order 11246, As Amended.

   (Applicable to all contracts/subcontracts in excess of $10,000)

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, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: 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. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

   (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

   (3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

   (4) The contractor will comply with all provisions of Executive Order 11246, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

   (5) The contractor will furnish all information and reports required by Executive Order 11246, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his
books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246, as amended, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246, as amended, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The contractor will include the portion of the sentence immediately preceding paragraph (i) and the provisions of paragraphs (i) through (vii) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246, as amended, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

B. Subcontracts: Each nonexempt prime contractor or subcontractor shall include the equal opportunity clause in each of its nonexempt subcontracts.

2. Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246, as amended). (Applicable to all contracts and subcontracts exceeding $10,000.)

A. 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.

B. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:
These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. 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 nonfederally involved construction.

The Contractor's compliance with the Executive Order 11246, as amended, 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 for the geographical area where the contract resulting from this solicitation is to be performed. 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 Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

C. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is the boundaries of the County of ______________________, Virginia, in which the project area is located.

(Applicable to all contracts/subcontracts in excess of $10,000)

A. As used in these specifications:

(1) "Covered area" means the geographical area described in the solicitation from which this contract resulted;

(2) "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

(3) "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

(4) "Minority" includes:

   • Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

   • Asian or 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

   • 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).

   • Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

B. 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 and which is set forth in the solicitations from which this contract resulted.

C. 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 or 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.

D. The Contractor shall implement the specific affirmative action standards provided in paragraphs g (1) through (16) 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 covered 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.

E. 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.

F. 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.

G. 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 action. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

(1) 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, will assign
two or more women to each construction project. The Contractor shall specifically ensure that all foremen, 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 or in such facilities.

(2) 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.

(3) 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.

(4) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman 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.

(5) 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 G (2) above.

(6) 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, annual report, etc.; 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.

(7) 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, General Foremen, etc., 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.

(8) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, 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.

(9) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female 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 any 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.

(10) 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 a Contractor's work force.

(11) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

(12) 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, through appropriate training, etc., such opportunities.

(13) 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.

(14) 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.
(15) 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.

(16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

H. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations [(1) through (16)]. 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 (1) through (16) 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.

I. A single goal for minorities and a separate rate single goal for women have been established. The Contractor, however, 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 a violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even through the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

J. 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 national origin.

K. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246, as amended.

L. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of 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.

M. 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 g 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 shall proceed in accordance with 41 CFR 60-4.8.

N. The Contractor shall designate a responsible official 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, whether age is greater than 62 years, 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 any easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

O. 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.

**Subpart D: Title VI of the Civil Rights Act Of 1964, As Amended**

No person in the United States shall, on the ground of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

**Subpart E: Section 109 Of The Housing And Community Development Act Of 1974, As Amended**

No person in the United States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the benefits of or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.
Any prohibition against discrimination on the basis of age under the Age Discrimination Act of 1975 or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973 shall also apply to any such program or activity.

**Subpart F: Opportunities For Minority And Female-Owned Businesses**

The work covered by this CONTRACT is subject to the provisions of OMB Part 85, Attachment 0 which requires that minority and female-owned businesses be solicited whenever they are sources of supplies, equipment, construction and services on federally funded projects.

A. In procuring supplies, equipment, construction and services, the CONTRACTOR and all SUBCONTRACTORS will contact those appropriate minority and female-owned firms provided by the PUBLIC BODY on its solicitation list and provide such firms reasonable opportunities to compete for procurement contracts.

B. The CONTRACTOR shall keep a complete and accurate record of all procurement of greater than ten thousand dollars ($10,000) made in the execution of the PROJECT. Such record shall be on a form provided by the PUBLIC BODY and shall be submitted to the PUBLIC BODY no less than every thirty (30) days.

**Subpart G: Compliance With Air And Water Acts**

(Applicable to all contracts/subcontracts in excess of $100,000)

In compliance with Section 306 of the Clean Air Act, as amended, (42 USC 1857(h)), Section 508 of the Clean Water Act, as amended, (33 USC 1368), Executive Order 11738, and the regulations (40 CFR, Part 15) of the Environmental Protection Agency with respect thereto the Contractor agrees that:

A. Any facility to be utilized in the performance of this contract or any subcontract shall not be a facility listed on the EPA List of Violating Facilities pursuant to 40 CFR 15.20.

B. He will comply with all requirements of Section 306 of the Clean Air Act, as amended, and Section 508 of the Clean Water Act, as amended, and all regulations and guidelines issued thereunder.

C. He will promptly notify the PUBLIC BODY of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized or to be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
D. He will include or cause to be included the provisions of paragraph 1 through 4 of this subpart in every nonexempt subcontract and that he will take such action as the Government may direct as a means of enforcing such provisions.

**Subpart H: Immigration Reform And Control Act Of 1986**

The Contractor agrees by signing this contract that he/she does not and will not during the performance of this contract violate the provisions of the Federal Immigration Reform and Control Act of 1986, which prohibits employment of illegal aliens.

**Subpart I: Disclosure**

All contractors and subcontractors shall complete a disclosure statement at the time of contract execution that discloses those persons who have an interest in the contract proceeds. Attach form follows this page.

**Subpart J: Access To Records And Construction Site**

The PUBLIC BODY, the Inspector General of the United States, United States Department of Housing and Urban Development, United States Department of Labor, the General Accounting Office, and the Virginia Department of Housing and Community Development shall be permitted by the CONTRACTOR to have full access to, and right to examine any pertinent books, documents, papers and records and construction site of the CONTRACTOR involving transactions related to this CONTRACT, during the period of this PROJECT and for three (3) years from the date of final payment or until all findings have been resolved to the satisfaction of the Commonwealth of Virginia.
# VIRGINIA COMMUNITY IMPROVEMENT GRANT
## COMMUNITY IMPROVEMENT GRANT DISCLOSURE REPORT

(Completed by all Developers, Contractors, Subcontractors or Consultants)

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Type of Contract (check applicable description)

- Construction Prime ☐
- *Construction Sub ☐
- Design ☐
- Other Specify ☐

Description of work or service provided:

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<td>5.</td>
<td>Date this Report ______ and ___ # of pages.</td>
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<td>6.</td>
<td>Revision to Report Date ______ and ___ # pages.</td>
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*Note: Housing Rehabilitation subcontractors are not required to be listed or to complete this Report.*
If Firm is an entity, identify each officer, director, principal stockholder and other persons who will have a $50,000 or 10% interest, whichever is lower.

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<th>Name (Last, First, Initial).</th>
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If there are no persons with a reportable financial interest, you must also certify that this is true.

I hereby certify this information is true.

(Signature) ________________________________  Date ________________

Title _____________________________________

**Certification**

**Warning:** If you knowingly make a false statement on this form you may be subject to civil or criminal penalties under Section 1001 of Title 18 of the United States Code. In addition, any person who knowingly and materially violates any required disclosure of information including intentional non-disclosure is subject to a civil money penalty not to exceed $10,000 for each violation.

**Note:** Please copy this page and attach additional pages as needed. Please indicate # of pages and date on cover.
TO GRANTEE:

Note: Insert the Wage Decision(s) here.
EXPLANATION OF PAYROLL RECORD (FORM WH-347)

What It Is Used For: The contractor and subcontractors submit their weekly Payroll Report to the Grantee each week or part of a week in which there are employees assigned to the project. All workers assigned that week MUST be included.

When It Is Used: During the construction phase of the project.

Where It Goes: In the Grantee's Labor Standards project file.

General Instructions: The Grantee must review each Payroll Report to assure that the Contractor and all subcontractors are complying with Davis-Bacon Act, Contract Work Hours and Standards Act, and Copeland "Anti-Kickback" Act requirements. Payroll records must be verified by field inspections (See Appendix 51 for Record of Employee Interview form) and checked against the Register of Assigned Employees (See Appendix 54 for form).

Form Instructions:

PAYROLL REPORT

Contractor or Subcontractor: Fill in your firm's name and check appropriate box.

Address: Fill in your firm's address.

Payroll No.: Beginning with the number "1", list the payroll number for the submission.

For Week Ending: List the workweek ending date.

Project and Location: List the project’s name as found on the CDBG Agreement.

Project or Contract No.: List the project’s CIG number.

Column 1 - Name and Individual Identifying Number of Worker: Enter each worker's full name and an individual identifying number on each weekly payroll submitted e.g.; the last four digits of the employee’s Social Security number (SSN). Full SNN shall ot be included on the payroll. Employers must maintain the current address and full SSN for each employee and must provide this information upon request to the Grantee and DHCD.
Column 2 - No. of Withholding Exemptions: This column is merely inserted for the employer's convenience and is not a requirement of Regulations, Part 3 and 5.

Column 3 - Work Classifications: List the classification as shown on the wage decision issued for this project. Consult classification and minimum wage schedule set forth in contract specifications. If additional classifications are deemed necessary, consult with your Grantee’s Contract Compliance Officer. An individual may be shown as having worked in more than one classification provided an accurate breakdown or hours worked in each classification is maintained and shown on the submitted payroll by use of separate entries. When listing a sole proprietor/subcontractor on a payroll, a prime contractor should record the sole proprietor/subcontractor’s information in the same manner as an employee.

Column 4 - Hours worked: List the day and date and straight time and overtime hours worked in the applicable boxes. On all contracts subject to the Contract Work Hours Standard Act, enter hours worked in excess of 40 hours a week as "overtime".

Column 5 - Total: Self-explanatory

Column 6 - Rate of Pay (Including Fringe Benefits): In the "straight time" box for each worker, list the actual hourly rate paid for straight time worked, plus cash paid in lieu of fringe benefits paid. When recording the straight time hourly rate, any cash paid in lieu of fringe benefits may be shown separately from the basic rate. For example, "$12.25/.40" would reflect a $12.25 base hourly rate plus $0.40 for fringe benefits. This is of assistance in correctly computing overtime. See "Fringe Benefits" below. When overtime is worked, show the overtime hourly rate paid plus any cash in lieu of fringe benefits paid in the "overtime" box for each worker; otherwise, you may skip this box. See "Fringe Benefits" below. Payment of not less than time and one-half the basic or regular rate paid is required for overtime under the Contract Work Hours Standard Act of 1962 if the prime contract exceeds $100,000. In addition to paying no less than the predetermined rate for the classification which an individual works, the contractor must pay amounts predetermined as fringe benefits in the wage decision made part of the contract to approved fringe benefit plans, funds or programs or shall pay as cash in lieu of fringe benefits. See "FRINGE BENEFITS" below.

Column 7 - Gross Amount Earned: Enter gross amount earned on this project. If part of a worker's weekly wage was earned on projects other than the project described on this payroll, enter in column 7 first the amount earned on the Federal or Federally assisted project and then the gross amount earned during the week on all projects, thus "$163.00/$420.00" would reflect the earnings of a worker who earned $163.00 on a Federally assisted construction project during a week in which $420.00 was earned on all work.

Column 8 - Deductions: Five columns are provided for showing deductions made. An Employee Payroll Deduction Authorization must be provided for any deduction listed in the “Other” column. All deductions must be in accordance with the provisions of the Copeland Act Regulations, 29 C.F.R., Part 3. If an individual worked on other jobs in addition to this project,
show actual deductions from his/her weekly gross wage, and indicate that deductions are based on his gross wages.

**Column 9 - Net Wages Paid for Week:** Self-explanatory.

**Totals** - Space has been left at the bottom of the columns so that totals may be shown if the contractor so desires.

**Submission of Payrolls** – Certified payroll reports may be submitted electronically, i.e., via the internet. However, the electronic signature/submission does not mean pdf files of signed payrolls attached to an email, or faxed copies of signed payrolls. These methods are comparable to photocopies and are not acceptable submissions.

**STATEMENT OF COMPLAINECE**

**Statement Required by Regulations, Parts 3 and 5:** While the "statement of compliance" need not be notarized, the statement (on page 2 of the payroll form) is subject to the penalties provided by 18 U.S.C. § 1001, namely, a fine, possible imprisonment of not more than 5 years, or both. Accordingly, the party signing this statement should have knowledge of the facts represented as true.

**Items 1 and 2:** Space has been provided between items (1) and (2) of the statement for describing any deductions made. If all deductions made are adequately described in the "Deductions" column above, state "See Deductions column in this payroll." See "FRINGE BENEFITS" below for instructions concerning filling out paragraph 4 of the statement.

**Item 4 FRINGE BENEFITS - Contractors who pay all required fringe benefits:** If paying all fringe benefits to approved plans, funds, or programs in amounts not less than were determined in the applicable wage decision of the Secretary of Labor, show the basic cash hourly rate and overtime rate paid to each worker on the face of the payroll and check paragraph 4(a) of the statement on page 2 of the WH-347 payroll form to indicate the payment. Note any exceptions in section 4(c).

**Contractors who pay no fringe benefits:** If not paying all fringe benefits to approved plans, funds, or programs in amounts of at least those that were determined in the applicable wage decision of the Secretary of Labor, pay any fringe benefit amount to each laborer and mechanic and insert in the "straight time" of the "Rate of Pay" column of the payroll an amount not less than the predetermined rate for each classification plus the amount of fringe benefits determined for each classification in the application wage decision. Inasmuch as it is not necessary to pay time and a half on cash paid in lieu of fringe benefits, the overtime rate shall be not less than the sum of the basic predetermined rate, plus the half time premium on basic or regular rate, plus the required cash in lieu of fringe benefits at the straight time rate. In addition, check paragraph 4(b) of the statement to indicate the payment of fringe benefits in cash directly to the workers. Note any exceptions in section 4(c).
Use of Section 4(c), Exceptions
Any contractor who is making payment to approved plans, funds, or programs in amounts less than the wage determination requires is obliged to pay the deficiency directly to the covered worker as cash in lieu of fringe benefits. Enter any exceptions to section 4(a) or 4(b) in section 4(c). Enter in the Exception column the craft, and enter in the Explanation column the hourly amount paid each worker as cash in lieu of fringe benefits and the hourly amount paid to plans, funds, or programs as fringe benefits. The contractor must pay an amount not less than the predetermined rate plus cash in lieu of fringe benefits as shown in section 4(c) to each such individual for all hours worked (unless otherwise provided by applicable wage determination) on the Federal or Federally assisted project. Enter the rate paid and amount of cash paid in lieu of fringe benefits per hour in column 6 on the payroll. See paragraph on "Contractors who pay no fringe benefits" for computation of overtime rate.

If the wage decision(s) issued required no fringes to be paid, do not check off any of the boxes in Section 4. Make a note in the “Remarks” box that no fringes are required to be paid by the wage decision(s) issued.
<table>
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<th>PAYROLL NO.</th>
<th>FOR WEEK ENDING</th>
<th>PROJECT AND LOCATION</th>
<th>PROJECT OR CONTRACT NO.</th>
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<tr>
<td>(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (E.G., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER</td>
<td>(2) WORK CLASSIFICATION</td>
<td>(4) DAY AND DATE</td>
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. § 3.3, 5.5(a). The Cope1and Act (40 U.S.C. § 3149) prohibits contractors and subcontractors performing work on Federally financed or assisted construction contracts from "fail[ing] to provide written notice to each employee during the period preceding work. U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii)) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and Federal contracting agencies receiving this information review this information to determine if employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, EDD, U.S. Department of Labor, Room G3620, 200 Constitution Avenue, N.W. Washington, D.C. 20210.
(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ — In addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ — Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

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<tr>
<th>EXCEPTION (CRAFT)</th>
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REMARKS:

NAME AND TITLE

SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1201 OF TITLE 18 AND SECTION 331 OF TITLE 31 OF THE UNITED STATES CODE.
CERTIFICATION OF SUBCONTRACTORS ON SITE
(To Be Submitted As Part of Weekly Payroll Report)

I, __________________________________________, the general contractor, hereby certify that the employees denoted on attached payroll reports for the week ending / / represent all employees that worked on CIG# - project for ___________________________ (insert Grantee’s Name), including employees of all subcontractors.

_______________________________________      /     /
Name and Title      Date

Names of Subcontractors That Worked On Project for This Pay Period.

1. ________________________________________________
2. ________________________________________________
3. ________________________________________________
4. ________________________________________________
5. ________________________________________________
EXPLANATION OF EMPLOYEE INTERVIEW FORM

What it is used for: To be used to interview project workers in order to determine that the Contractor and all subcontractors are complying with Davis-Bacon Act, Contract Work Hours and Standards Act, and Copeland “Anti-Kickback” Act requirements. It is used as a test against payroll information. It is also used to verify compliance with Section 3 requirements.

When It Is Used: During the construction phase of the project.


General Instructions: Employees should be selected for interviews either at random or on the basis of suspected irregularities as determined through the site visit or Payroll Reports. The number of interviews necessary is determined by the size of the Project. A minimum of at least one worker per trade and 25% of the total number of workers must be interviewed. Interviews must be conducted during construction a minimum of once a month to determine the Contractor’s compliance with the aforementioned federal requirements. Interviews must take place during the times in which each subcontract is being performed to assure that all trades are covered. This may mean that interviews will have to be conducted during evening or weekend hours.

Form Instructions:

Items 1a - 1c: Self-explanatory

Items 2a – 2d: Enter the employee’s full name, a telephone number where the employee can be reached, and the employee’s home address. Many construction workers use a temporary address in the locality of the project and have a more permanent address elsewhere from which mail may be forwarded to them. Obtain a more permanent address, if available.

Items 3a – 4c: Enter the employee’s responses. Ask the employee whether they have a pay stub with them; if so, determine whether the pay stub is consistent with the information provided by the employee.

Items 5 – 7: Try to get specific responses from the employee so it is easier to verify that the work observed is consistent with the job classification listed on the payroll report. For example, the job...
classification (#5) must identify the trade involved e.g.; Carpenter, Electrician, Plumber, etc.

Items 8 – 12b: Self-explanatory. If the employee will not sign the form, just note it in the appropriate box

Items 13 – 15c: These items represent some of the most important information that can be gathered while conducting on-site interviews. Please be specific about the duties you observed the employee performing. It may be easiest to make these observations before initiating the interview. Please record any comments or remarks that may be helpful. For example, if the employee interviewed was working with a crew, how many workers were in the crew? What activities was the employee doing e.g.; dumping gravel, laying down pipe, connecting pipe in a ditch, etc. What tools and pieces of equipment was the employee using e.g.; shovel, level, pipe, pry bar, etc.

The level of specificity that is warranted is directly related to the extent to which interview(s) or other observations indicate that there may be violations present. If interviews indicate that there may be underpayments involving a particular trade(s), the interviewer is encouraged to interview as many workers in that trade(s) that are available.

Items 16 – 17b: The information on the form may be reviewed for general compliance, initially. For example, are the job classification and wage rate stated by the employee compatible with the classifications and wage rates on the applicable wage decision? Are the duties observed by the interviewer consistent with the job classification?

After completion of the interview the Contract Compliance Officer must note on the form whether the employee’s statements were consistent and whether they verified what was observed.

The Contract Compliance Officer must cross reference the information on the Record of Employee Interview form with information from the Contractor’s weekly Payroll Report, the Register of Assigned Employees, and the Wage Decision, indicating so by filling out the bottom part of the form. Appropriate action must be initiated to clear any discrepancies and questionable items.

Call your Community Representative for a copy of the Record of Employee Interview instructions in Spanish.
The information is collected to ensure compliance with the Federal labor standards by recording interviews with construction workers. The information collected will assist HUD in the conduct of compliance monitoring; the information will be used to test the veracity of certified payroll reports submitted by the employer. The information collected on this form is considered sensitive and is protected by the Privacy Act. The Privacy Act requires that these records be maintained with appropriate administrative, technical, and physical safeguards to ensure their security and confidentiality. In addition, these records should be protected against any anticipated threats or hazards to their security or integrity that could result in substantial harm, embarrassment, inconvenience, or unfairness to any individual on whom the information is maintained.

<table>
<thead>
<tr>
<th>1a. Project Name</th>
<th>2a. Employee Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1b. Project Number</td>
<td>2b. Employee Phone Number (including area code)</td>
</tr>
<tr>
<td>1c. Contractor or Subcontractor (Employer)</td>
<td>2c. Employee Home Address &amp; Zip Code</td>
</tr>
<tr>
<td>2d. Verification of identification?</td>
<td>Yes ☐ No ☐</td>
</tr>
<tr>
<td>3a. How long on this job?</td>
<td>3b. Last date on this job before today?</td>
</tr>
<tr>
<td>Vacation ☐ Yes ☑ No ☐</td>
<td>Medical ☐ Yes ☑ No ☐</td>
</tr>
<tr>
<td>5. Your job classification(s) (list all) --- continue on a separate sheet if necessary</td>
<td></td>
</tr>
<tr>
<td>6. Your duties</td>
<td></td>
</tr>
<tr>
<td>7. Tools or equipment used</td>
<td></td>
</tr>
<tr>
<td>8. Are you an apprentice or trainee? ☐ ☐</td>
<td>10. Are you paid at least time and ½ for all hours worked in excess of 40 in a week? ☐ ☐</td>
</tr>
<tr>
<td>9. Are you paid for all hours worked? ☐ ☐</td>
<td>11. Have you ever been threatened or coerced into giving up any part of your pay? ☐ ☐</td>
</tr>
<tr>
<td>12a. Employee Signature</td>
<td>12b. Date</td>
</tr>
<tr>
<td>13. Duties observed by the Interviewer (Please be specific.)</td>
<td></td>
</tr>
<tr>
<td>14. Remarks</td>
<td></td>
</tr>
<tr>
<td>15a. Interviewer name (please print)</td>
<td>15b. Signature of Interviewer</td>
</tr>
<tr>
<td>16. Remarks</td>
<td></td>
</tr>
<tr>
<td>17a. Signature of Payroll Examiner</td>
<td>17b. Date</td>
</tr>
</tbody>
</table>

Previous editions are obsolete

Form HUD-11 (08/2004)
**Historial de Entrevista del Empleado**

La información que se recopila tiene la finalidad de garantizar la conformidad a las normas laborales Federales mediante entrevistas con obreros de construcción. La información recopilada asistirá a HUD a conducir el monitoreo de conformidad; la información se usará para examinar la veracidad de los informes de nómina certificados presentados por el patrón. La Ley de Privacidad requiere que estos archivos se mantengan con salvaguardas administrativos, técnicos, y físicos apropiados para garantizar su seguridad y confidencialidad. Además, estos archivos deberán ser protegidos contra cualquier amenaza anticipada o riesgos a su seguridad o integridad, que podría causar daño sustancial, vergüenza, inconveniencias, o injusticias a cualquier individuo de quien se mantiene la información. **La información recopilada aquí es voluntaria y cualquier información proporcionada será mantenida como confidencial.**

<table>
<thead>
<tr>
<th>1a. Nombre del proyecto</th>
<th>2a. Nombre del empleado</th>
</tr>
</thead>
<tbody>
<tr>
<td>1b. Número del proyecto</td>
<td>2b. Número de teléfono del empleado (incluso prefijo local)</td>
</tr>
<tr>
<td>1c. Contratista o subcontratista (Patrón)</td>
<td>2c. Dirección residencial del empleado y código postal</td>
</tr>
<tr>
<td>2d. ¿Verificación de identificación?</td>
<td>Sí [ ] No [ ]</td>
</tr>
<tr>
<td>3a. ¿Cuánto tiempo en este trabajo?</td>
<td>3b. ¿Último día en este trabajo antes de hoy?</td>
</tr>
<tr>
<td>3c. ¿No. de horas en su último día en este trabajo?</td>
<td>4a. ¿Salario por hora?</td>
</tr>
<tr>
<td>4b. ¿Beneficios complementarios?</td>
<td>4c. ¿Talonario de paga?</td>
</tr>
<tr>
<td>Sí [ ] No [ ]</td>
<td>Sí [ ] No [ ]</td>
</tr>
<tr>
<td>Vacaciones</td>
<td>Sí [ ] No [ ]</td>
</tr>
<tr>
<td>Médicos</td>
<td>Sí [ ] No [ ]</td>
</tr>
<tr>
<td>Pensión</td>
<td>Sí [ ] No [ ]</td>
</tr>
</tbody>
</table>

5. Clasificación(es) de su trabajo(s) (enumere todas) --- continúe en una página separada si es necesario

6. Sus deberes

7. Herramientas o equipo usado

<table>
<thead>
<tr>
<th>S</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. ¿Es aprendiz?</td>
<td>10. ¿Le pagan al menos tiempo y medio por todas las horas trabajadas superior a 40 horas semanales?</td>
</tr>
<tr>
<td>9. ¿Le pagan todas las horas trabajadas?</td>
<td>11. ¿Alguna vez ha sido amenazado o coercionado a entregar parte de su paga?</td>
</tr>
</tbody>
</table>

12a. Firma del empleado 12b. Fecha

13. Deberes observados por el entrevistador (Por favor sea específico.)

14. Comentarios

15a. Nombre del entrevistador (use letra de imprenta) 15b. Firma del entrevistador 15c. Fecha de la entrevista

### Examinación de Nómina

16. Comentarios

<table>
<thead>
<tr>
<th>S</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>17a. Firma del examinador de nómina</td>
<td>17b. Fecha</td>
</tr>
</tbody>
</table>

Federal Contract Inserts
Rev. 02-25-13
Register of Assigned Employees

Month Covered: ______________, 2012  Date Completed: ______________________

Submit initial list of workforce prior to start of construction; update monthly throughout construction to show changes.

SECTION I:  Identification of Level of Submittal, see instructions on back of form

(1) Grantee: ___________________________ Grant #: __________ Project Name: ______________________________

HIRING GOALS: 30% LOCAL LMI (Section 3)  ___ % MINORITY  6.9 % FEMALE

Prime Contractor ___________________________ Contracted Amount $__________________________

(2) Subcontractor ___________________________ Contracted Amount $__________________________

SECTION II:  List all workers paid by this contract. For NEW HIRES: complete items ‘a’ thru ‘h.’ For MODIFICATIONS: complete only item ‘a’ and item(s) being modified. Update the Register to add new hires, rehires and changes to job classifications, rate of pay or authorized payroll deductions.

<table>
<thead>
<tr>
<th>a. NAME OF EMPLOYEE</th>
<th>b. COUNTY OF RESIDENCE</th>
<th>c. TRADE &amp; JOB CLASSIFICATION</th>
<th>d. RATE OF PAY &amp; BENEFITS</th>
<th>e. (1). DATE HIRED or e (2). DATE RECALLED</th>
<th>f. AUTHORIZED PAYROLL DEDUCTIONS</th>
<th>g. MINORITY</th>
<th>h. GENDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td></td>
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<tr>
<td>b.</td>
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<tr>
<td>a.</td>
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<td>a.</td>
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<td>b.</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

*SECTION 3 RESIDENT – A resident of the area in which Section 3 covered assistance is expended, and who qualifies as a low- or very low-income person.

SECTION 3 BUSINESS: - A business of the area in which 51% or more is owned by Section 3 Residents or 30% of employed staff are Section 3 Residents; or 25% of contracts committed to Section 3 Businesses
EXPLANATION OF REGISTER OF ASSIGNED EMPLOYEES

What it is used for: To document all procurements of more than $10,000 (or more than $1,000 if a housing rehabilitation project) made in a CDBG project. To track progress toward hiring goals. To assist in assuring compliance with Section 3 and Davis-Bacon and Related Acts.

When it is used: To document the initial workforce and new hires, rehires and any changes in job classifications, rate of pay and authorized deductions throughout the construction process. It is updated on an ongoing basis.

Where it goes: The Grantee files all reviewed and accepted Registers in their labor standards and equal opportunity project files.

Instructions:

- COMPLETE THE “Month Covered” AND “Date Completed” IN THE TOP RIGHT CORNER.

- The Local LMI (Section 3) Hiring Goal is always 30%. Insert the Minority and Female goals as found in the Transmittal of Wage Decision letter sent to the Chief Executive Official by the PMO Program Manager.

- ROUND CONTRACT AMOUNTS TO THE NEAREST DOLLAR.

- NEW HIRES are registered as such one time and only on the original submittal or for the month in which it occurred; DO NOT DUPLICATE ‘NEW HIRES’ ON SUBSEQUENT SUBMITTALS.

- RECALLED means a person who was off of the Company’s payroll and is now back on the payroll. The person is treated as NEW HIRES except that the date recalled is entered in e (2). Subsequent recalls of any employees, whether originally listed as a ‘new hire’ or a ‘recall’ are treated as ‘modifications,’ see below.

- MODIFICATIONS affect ONLY the following items: (ONLY ITEM ‘a’ AND ITEM(S) BEING MODIFIED ARE COMPLETED FOR MODIFICATIONS.)
  - changes to employee’s name, e.g. due to marriage (item a) (if change is to name, show both old and new name)
  - changes in trade and job classification (item c)
  - changes in rate of pay and benefits (item d)
  - changes in authorized payroll deductions (item f)
  - a recall of an employee previously registered (item e (2).

GRANTEE’S RESPONSIBILITIES: For every procurement with a prime contractor, the Grantee must complete item (1) of SECTION I and supply the prime contractor with enough copies for the duration of the contract. After submission of the Register by its Prime, the Grantee must review the Register for completeness, accuracy and consistency with the Monthly CDBG Register of Contractors, Subcontractors, and Suppliers and the Payroll Report.

PRIME CONTRACTOR’S RESPONSIBILITIES: The Prime Contractor must submit this prior to start of construction and update it as necessary throughout the construction process. The Prime Contractor must use the forms supplied by the Grantee in which item (1) of Section I is already completed; item (2) remains blank. In SECTION II, the Prime Contractor completes items ‘a’ thru ‘h’ on ‘new hires’ and first time ‘recalls’, and only item ‘a’ and the item(s) being modified for modifications.

For every procurement with a subcontractor, the Prime Contractor should complete item (2) of SECTION I (item (1) is already completed on the form) and supply the subcontractor with enough copies for the duration of the
subcontract. The Prime Contractor must obtain this form from all of its subcontractors for submission to the Grantee.

**SUBCONTRACTOR’S RESPONSIBILITIES:** The Subcontractor must submit this prior to start of construction, update it as necessary throughout the construction process and submit it to the Prime Contractor.

The Subcontractor must use the forms supplied by the Prime Contractor in which Section I is already completed. In SECTION II, the Subcontractor completes items ‘a’ thru ‘h’ on ‘new hires’ and first time ‘recalls’; and only item ‘a’ and the item(s) being modified for modifications.
**Monthly CDBG Register of Contractors, Subcontractors and Suppliers**

*Register all procurements of more than $10,000 one time only, in month of occurrence*

| Month Covered: | 2012 |

**SECTION I:** Identification of Level of Submittal, see instructions on back of form

1. **Grantee:** ___________________________  **Grant #:** ____________  **Project Name:** ___________________________
2. **Local Business** County*: ___________________________
3. **General Contractor** IRS# (or owner’s SSN) ___________________________
4. **Subcontractor** IRS# (or owner’s SSN) ___________________________

**SECTION II:** Details of Procurements

Choose one (first row should be for the General Contractor)

<table>
<thead>
<tr>
<th>Name and Physical Address of Business, and IRS# (or owners’ SSN)</th>
<th>Contract Description or Items Supplied</th>
<th>Amount of Contract or Purchase</th>
<th>Ownership of Business (check all that apply; do not leave blank)</th>
</tr>
</thead>
<tbody>
<tr>
<td>____ General Contractor</td>
<td>____ Minority Business</td>
<td>$</td>
<td>____ Minority Business</td>
</tr>
<tr>
<td>____ Subcontractor</td>
<td>____ White American</td>
<td></td>
<td>____ White American</td>
</tr>
<tr>
<td>____ Supplier</td>
<td>____ Black American</td>
<td></td>
<td>____ Black American</td>
</tr>
<tr>
<td>IRS# (or SSN):</td>
<td>____ Local (Section 3) Business</td>
<td></td>
<td>____ Local (Section 3) Business</td>
</tr>
<tr>
<td>____ Minority Business</td>
<td>____ Native* American</td>
<td></td>
<td>____ Native* American</td>
</tr>
<tr>
<td>____ White American</td>
<td>____ Hispanic American</td>
<td></td>
<td>____ Hispanic American</td>
</tr>
<tr>
<td>____ Black American</td>
<td>____ Female-Owned Business</td>
<td></td>
<td>____ Female-Owned Business</td>
</tr>
<tr>
<td>____ Not American Owned</td>
<td>____ Asian American</td>
<td></td>
<td>____ Asian American</td>
</tr>
<tr>
<td>____ Not AmericanOwned</td>
<td>____ Not American Owned</td>
<td></td>
<td>____ Not American Owned</td>
</tr>
</tbody>
</table>

*SECTION 3 RESIDENT – A resident of the area in which Section 3 covered assistance is expended, and who qualifies as a low- or very low-income person

*SECTION 3 BUSINESS – A business of the area in which 51% or more is owned by Section 3 residents or 30% of employed staff are Section 3 residents or 25% of subcontracts are committed to Section 3 businesses.

Federal Contract Inserts
Rev. 02-25-13
EXPLANATION OF MONTHLY REGISTER OF CONTRACTORS, SUBCONTRACTORS AND SUPPLIERS

What it is used for: To document all procurements of more than $10,000 made in a CDBG project. To assist in assuring compliance with Section 3 and Davis-Bacon and the Related Acts.

When it is used: Procurements are registered as they occur or on a monthly basis prior to submittal. This form is compiled by the Grantee, the General Contractor, and each subcontractor per the instructions below for each month and part of month during the course of a contract.

Where it goes: The Grantee files all reviewed and accepted submittals in their procurement and equal opportunity project files.

Instructions:
- Complete the “Month Covered” and “Date Completed” in the top right corner.
- ROUND CONTRACT AMOUNTS TO THE NEAREST DOLLAR.
- RECORD THE PHYSICAL ADDRESS OF BUSINESS ONLY. P. O. Boxes and other mailing addresses are not acceptable.
- A procurement is registered one time and only for the month in which it occurred; DO NOT DUPLICATE PROCUREMENTS ON SUBSEQUENT SUBMITTALS.

GRANTEE’S RESPONSIBILITIES: The Grantee should complete this form each month to register all applicable procurements with General Contractors, subcontractors and suppliers. For submittal to itself the Grantee completes line (1) of SECTION I; line (2) and (3) will be left blank. For every procurement with a General Contractor, the Grantee should complete lines (1) and (2) of SECTION I and supply the General Contractor with enough copies for the duration of the contract. After submission of the Register by its Prime, the Grantee must review the Register for completeness, accuracy and consistency with the Register of Assigned Employees and the Payroll Report. The Grantee should not pay the prime its final invoice until it has received all of the required Registers and has determined their accuracy.

GENERAL CONTRACTOR’S RESPONSIBILITIES: The General Contractor must prepare and submit this form every month and part of month to the Grantee along with any submittals received from subcontractors. The General Contractor must use the forms supplied by the Grantee in which lines (1) and (2) of SECTION I are already completed and line (3) remains blank.

In SECTION II, the Prime will identify each procurement as either ‘subcontractor’ or ‘supplier’ and will give complete information in the remaining columns. For every procurement with a subcontractor, the General Contractor should complete item (3) of SECTION I (lines (1) and (2) being already completed by the Grantee) and supply the subcontractor with enough copies for the duration of the subcontract. The General Contractor must obtain this form monthly from all of its subcontractors for submission to the Grantee.

SUBCONTRACTOR’S RESPONSIBILITIES: The Subcontractor must complete this form every month and part of month during the course of the contract for submittal to the General Contractor. The Subcontractor should use the forms supplied by the General Contractor in which SECTION I is already completed. In SECTION II, the Subcontractor will identify each procurement as either ‘subcontractor’ or supplier’ and will give complete information in the remaining columns. The subcontractor must submit its final Register to the General Contractor with its final invoice. The General Contractor must review its subcontractor’s final register and verify that it is complete and accurate before payment of the final invoice to the subcontractor.
CONTRACTOR'S QUALIFICATION STATEMENT

Please attach a photocopy of contractor’s license and EPA Certification. All questions must be answered in full. Additional sheets for clarification of answers or additional information must be attached. **This statement must be notarized.**

1. Name, address, phone number, contractor license #, and IRS number (or last 4 digits of owner's social security #) of company.

2. List the company’s owner and principal officer and date and place organized.

3. Describe general character of work performed.

4. List any work awarded failed to be completed or contracts defaulted on. Note where and why.

5. List the three most important recent contracts over $10,000. State the owner, work, approximate cost, place, date started and date completed.

   1. ____________________________ $ ________
      ____________________________ From ________ To ________

   2. ____________________________ $ ________
      ____________________________ From ________ To ________

   3. ____________________________ $ ________
      ____________________________ From ________ To ________

6. List the contracts upon which you are currently working. State the owner, location, approximate cost, and estimated date of completion.
7. List three material suppliers and amount of credit available.
   1. ___________________________________________ $ ____________
   2. ___________________________________________ $ ____________
   3. ___________________________________________ $ ____________

8. List bank references and amount of credit available.
   1. ___________________________________________ $ ____________
   2. ___________________________________________ $ ____________

9. List insurance coverage and amount.
   Liability-Property: __________________________ $_________
   Liability-Personal Injury: ________________ $_________
   Vehicle and Equipment: ______________________ $_________
   Other-__________________: ______________________ $_________
   (identify)

10. List subcontractors utilized. State name, address, specialty, subcontractor license #, and years of experience.
    1. Name: ___________________________________________
       Address: _______________________________________
       Specialty: _______________________________________
       License # ___________________ Years of Experience _________

    2. Name: _________________________________________
       Address: _______________________________________
       Specialty: _______________________________________
       License # ___________________ Years of Experience _________

    3. Name: _________________________________________
       Address: _______________________________________
       Specialty: _______________________________________
       License # ___________________ Years of Experience _________

11. Provide a general description of the experience of the company and its key personnel.

12. Number of current full-time employees
    Number employed at highest level in past twelve months ________
13. Are you on any list of debarred contractors maintained by the U.S. Department of Labor, 
U.S. Department of Housing & Urban Development, or Virginia Department of Highways?
□ YES  □ NO

14. All contractors, subcontractors and their workers, including electricians, must have 
appropriate lead-based paint training in order to be considered for work under this program.

   a. Have any of your workers attended this training?
      □ YES  □ NO  If yes, complete the Employee Training Record.
      If not, they will be required to attend the training before they can work on a project site. Do you need information about lead training and certification classes?
      □ YES  □ NO

   b. Are you an EPA certified “Renovation, Repair and Painting” firm?
      □ YES  □ NO

The undersigned hereby authorizes and requests any person, firm or Corporation to furnish any 
information requested by ___________________________ in verification of the recitals 
comprising this statement of contractor's qualifications:

Contractor’s Name: ________________________________________________

Authorized Signature: ______________________________________________
Type Name and Title: ________________________________________________
Date: _____________________________________________________________

City/County/Town of ________________________________,
Commonwealth of Virginia

_____________________________ being duly sworn deposes and says that he/she is
_____________________________ of ________________________ and
that the answers to the foregoing questions and all statements therein contained are true and 
correct.

My commission expires: ________________________.

Given under my hand this _______day of ____________, 20____.

________________________________
Notary Public Registration Number
**LEAD BASED PAINT RELATED TRAINING AND CERTIFICATIONS EMPLOYEE RECORD**

Contractor’s Name: ___________________________  Date: ____________

<table>
<thead>
<tr>
<th>Employee’s Name</th>
<th>Training Type and Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Certified Renovator</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Note: All contractors, subcontractors and workers must have, at a minimum, the Lead Safe Work Practices training to work on DHCD housing rehabilitation projects consisting of interim controls. Each contractor must also have EPA Certification in “Renovation, Repair and Painting” as a firm and at least one individual Certified Renovator assigned to the project.
EXPLANATION OF EQUAL OPPORTUNITY CHECKLIST

What it is Used For: This is required to assure that all required Equal Opportunity requirements are explained and all appropriate forms are conveyed to the Contractor and subcontractors.

When it is Used: During the Pre-construction Conference.

Where it Goes: To Grantee's Equal Opportunity project file.

Instructions: Part of the 'wage decision packet' sent by DHCD with the Wage Decision applicable to the activity(s) being contracted. Use the checklist to check off equal opportunity items as they are addressed at the Pre-construction Conference. Have the Contractor and any known subcontractors sign this checklist after completing review of items. Any subcontractors hired subsequent of the Pre-construction Conference must also sign the checklist.

See also “Equal Opportunity Requirements,” as found in Chapter 8: Federal Labor Standards and Equal Opportunity Requirements.
EQUAL OPPORTUNITY CHECKLIST
(to be completed initially at pre-construction conference)

☐ Contractors have reviewed and understand Equal Opportunity/Section 3 contract provisions.

☐ Contractors must inform unions or other source of workers of Equal Opportunity requirements such as:
   a) taking applications at jobsite; and
   b) advertising in local or appropriate media.

* ☐ Contractors have received DHCD forms "Register of Assigned Employees" and "Register of Contractors, Subcontractors and Suppliers"; and have been instructed to submit initial forms at Start of Construction and every month or part of month during the course of the contract.

☐ Contractors are aware of goals for utilization of minority and female workers.

☐ Contractors are aware that they are obligated to the greatest extent feasible to hire lower income project area residents as workers and trainees and to utilize project area businesses and businesses owned by project area residents.

☐ Prime contractor has been given Equal Opportunity poster and will display it in prominent place at jobsite(s).

* ☐ If contractors employ more than 50 persons and contract is over $50,000 they have submitted form EEO-1 to the Joint Reporting Committee, P. O. Box 779, Norfolk, Virginia 23501; 804/461-1213.

* Denotes those items which must be submitted by the Contractor.
<table>
<thead>
<tr>
<th>(Public Body):</th>
<th>(Prime Contractor):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td>Signature</td>
</tr>
<tr>
<td>Title</td>
<td>Title</td>
</tr>
<tr>
<td>Company</td>
<td>Company</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(Subcontractor):</th>
<th>(Subcontractor):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td>Signature</td>
</tr>
<tr>
<td>Title</td>
<td>Title</td>
</tr>
<tr>
<td>Company</td>
<td>Company</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(Subcontractor):</th>
<th>(Subcontractor):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td>Signature</td>
</tr>
<tr>
<td>Title</td>
<td>Title</td>
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EXPLANATION OF LABOR STANDARDS CHECKLIST

What it is Used For: This is required to assure that all required Labor Standards requirements are explained and all appropriate forms are conveyed to the Contractor and subcontractors.

When it is Used: During the Pre-construction Conference.

Where it Goes: To Grantee's Labor Standards project file.

Instructions: Part of the 'wage decision packet' sent by DHCD with the Wage Decision applicable to the activity(s) being contracted. Use the checklist to check off labor standards items as they are addressed at the Pre-construction Conference. Have the Contractor and any known subcontractors sign this checklist after completing review of items. Any subcontractors hired subsequent of the Pre-construction Conference must also sign the checklist.

See also “Labor Standards Checklist,” as found in Chapter 8: Federal Labor Standards and Equal Opportunity Requirements.
LABOR STANDARDS CHECKLIST
(to be completed initially at pre-construction conference)

☐ Contractors have reviewed and understand all Labor Standards contract provisions.

☐ Contractors have reviewed and understand wage decision and job classifications.

☐ Contractors have been informed that all workers:

  a) must be paid at least the appropriate minimum wage for the job classification;
  b) must be paid time-and-a-half for all work beyond 40 hours per week;
  c) must be paid at least weekly;
  d) must perform only the work which is covered by the job classification they are listed and paid in. If a worker performs in more than one job classification, he must be paid either the wage of the highest paid job he works or time cards signed by the worker must document the amount of time worked in each job during the week.

☐ Contractors will inform all workers:

  a) of their job classifications and duties;
  b) of their wage rates and fringe benefits;
  c) that they may be interviewed on the jobsite and are required to cooperate;
  d) of deductions from pay.

☐ Contractors will obtain each worker's name, permanent address, and social security number prior to assigning them to a jobsite.

*☐ Contractors will obtain certification of any apprentices and trainees, including registration number and year of program, and will submit the same to the Public Body.

☐ Contractors are aware that they are responsible for the compliance of their subcontractors with Labor Standards provisions.

☐ Contractors must verify that the subcontractors(s) is/are not debarred from Federal or State contracts.
Contractors will construct and erect a project identification sign at the construction site identifying DHCD as a funding source per specifications as stated in contract documents.

Prime contractor has received and will post in a prominent place on the site:

a) Wage Decision;

b) Labor Standards poster: "Notice to All Employees... " (Davis-Bacon Act) WH-1321

c) "Safety and Health Protection on the Job" poster (VA DOL).

* Contractors have received Payroll report form (WH-347) and understand:

a) how it is to be filled out;

b) that it must be filled out completely;

c) that it must include every worker assigned to the project (excluding non-working, supervisory, or clerical personnel);

d) that Payroll reports must be submitted for every week or part of a week during the course of the contract, and must be submitted by all subcontractors. Payroll reports will be submitted to the Grantee within seven (7) days of the end of the work week.

Contractors will maintain employment and payroll records which will be accessible to the Public Body, DHCD, and appropriate federal agencies for 3 years.

*Denotes those items which must be submitted by the Contractor.
Minutes of Preconstruction Conference **

Grantee: ______________________________

Contract #______________

Project Name: ____________________________________________________________

Project Location: _________________________________________________________

Description of Project: _____________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Prime Contractor: _________________________________________________________

Known Subcontractors: ____________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Amount of Contract: $______________________________

Date and Place of Conference: _____________________________________________

________________________________________________________________________

Attendees/Name and Title:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

** ATTACH AGENDA AND HANDOUTS
Summary of Items Covered: (Include all major construction related issues and attach Labor Standards and Equal Opportunity (Section 3) checklists)

Comments of Unresolved Issues:

_________________________________________________
Prime Contractor & Title

_________________________________________________
Project Engineer

_________________________________________________
Project Manager - Public Body
EXPLANATION OF
NOTICE TO PROCEED WITH CONSTRUCTION FORM

Explanation of Form

After all Pre-construction Conference issues are resolved and the General Contractor submits all required bonds and insurance certifications, the construction contract may be executed. Following that, the Notice to Proceed with Construction should be given to the Contractor.

*A copy of the Notice to Proceed with Construction must be sent to your DHCD Community Development Specialist.*
NOTICE TO PROCEED WITH CONSTRUCTION

(Date)

TO: ____________________________________________________________

(Successful Low Bidder)

ADDRESS: __________________________________________________________

_____________________________________________________________________

PROJECT NAME: _______________________________________________________

CONTRACT FOR: _______________________________________________________

_____________________________________________________________________

You are hereby notified to commence work in accordance with the Contract Documents
dated (insert date) on or before (insert date) and you are to complete the work within ______
consecutive calendar days thereafter. The date of substantial completion of all work is therefore
(insert date) and the date of final completion of construction is (insert date).

A notice of Start of Construction and all required pre-construction documents must be
submitted to the Public Body no later than one (1) day prior to commencement of work.

___________________________________
(Owner)

___________________________________
(Signature of Authorized Official)

___________________________________
(Type Title)

ACCEPTANCE OF AWARD

___________________________________
(Contractor)

___________________________________
(Signature of Authorized Official)

___________________________________
(Type Title)

cc:               Engineer
                DHCD Community Development Specialist
EXPLANATION OF APPLICABILITY OF
EQUAL OPPORTUNITY CLAUSE

1. What contracts or subcontracts are subject to the Equal Opportunity Clause?

   -- "Federal government contracts or subcontracts" exceeding $10,000 or contracts or
   subcontracts with the Federal government which, in any 12 month period, total or can
   reasonably be expected to have an aggregate total value exceeding $10,000.

   -- "Federal assisted construction contracts/subcontracts and non-construction
   contracts/subcontracts" exceeding $10,000.

2. When is a bidder required to have on file at each establishment, affirmative action programs?

   -- For NON-CONSTRUCTION CONTRACTS (service and supply), DOL regulations (41
   CFR 60-2) call for a Written Affirmative Action Plan from each prime contractor or
   subcontractor with 50 or more employees and (1) a contract of $50,000 or more; or (2)
   Government bills of lading which, in any 12 month period, total or can reasonably be
   expected to total $50,000 or more.

   -- For CONSTRUCTION CONTRACTS, DOL Regulations do not require a Written
   Affirmative Action Plan. However, Contractors must take specified Affirmative Action
   Steps and to demonstrate with evidence that the Specifications (41 CFR 60-4. 3) in the
   Equal Opportunity Clause have been implemented.

3. What reports are due under the applicable filing requirements?

   -- Standard Form 100 (EEO-1)

   Each person (contractor and subcontractor) shall file annually with the Joint
   Reporting Committee, on or before March 31, reports on Standard Form 100
   (EEO-1), if such person (1) is not exempt as provided for by 41 CFR 60-1.5, (2) has
   50 or more employees, and (a) a contract of $50,000 or more; or (b) government bills
   of lading which, in any 12 month period, total or can reasonably be expected to total
   $50,000 or more.

   Each person required to submit reports shall file such report with the PUBLIC BODY
   within 30 days after the award to him of a contract or subcontract, UNLESS such
   person has submitted such a report within 12 months preceding the date of the award.
   Subsequent reports shall be submitted annually, on or before March 31, to the Joint
   Reporting Committee, P. O. Box 779, Norfolk, Virginia 23501. Forms can be
   requested in writing or by calling 804/461-1213.
BIDDER COMPLIANCE STATEMENT

CERTIFICATION REGARDING EQUAL EMPLOYMENT OPPORTUNITY

Applicability: Bid exceeding ten thousand dollars ($10,000) for contract/subcontract of unlimited amount and non-construction contract/subcontract for less than one million dollars ($1,000,000).

This statement relates to a proposed contract between (pick one): □ Contractor and Public Body OR □ Contractor and Subcontractor to be funded under a federally assisted project. Pursuant to Executive Order 11246 and its implementing regulations at 41 CFR 60-1.7(b) (1), as the undersigned bidder, I certify that:

1) Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. □ YES □ NO

2) Bidder has developed and has on file at each establishment, affirmative action programs pursuant to 41 CFR 60-2 (applies only to non-construction contractors). □ YES □ NO (contract less than $50,000 AND fewer than 50 employees)

3) Bidder has filed with the Joint Reporting Committee; the Director of the Office of Federal Contract Compliance Programs, U.S. Department of Labor; and agency; and/or the Equal Employment Opportunity Commission; all reports due under the applicable filing requirements. □ YES □ NO □ None Required

I understand that if I have failed to file any compliance reports which have been required of me, or have failed to develop and have on file at each establishment affirmative action programs pursuant to 41 CFR 60-2, when required, I am not eligible to have my bid or proposal considered, or to enter into the proposed contract.

I further understand that if awarded the proposed contract, and the contract for the FIRST time brings me under the filing requirements or the written affirmative action programs that I will, as applicable: (a) within 30 days file with the Public Body, Standard Form 100 (EEO-1); and (b) within 120 days from the commencement of the contract, develop and submit to the Director of the Office of Federal Contract Compliance Programs, U.S. Department of Labor, for approval a Written Affirmative Action Plan.

Signature: _______________________________________________________________
Type Name: _______________________________ Title: ______________________
Address, including zip code: _______________________________________________
IRS # (or owner’s social security #): ________________________________________

Attachment: Any other reports that have been required pursuant to Executive Order 11246 by a contracting agency, the Equal Opportunity Commission, or the Director of the Office of Federal Contract Compliance Programs, U. S. DOL.
Attachment to Certain Construction Contracts

Applicable to contracts/subcontracts in excess of $2,000 that are funded under legislation subject to Reorganization Plan Number 14 of 1950 (64 Stat. 1267), and which is for construction, alteration, and/or repair, including painting and decoration. Some of the legislation most likely to provide funding (that is, combined with CDBG funds) is: Appalachian Regional Development Act of 1965, Federal Water Pollution Control Act, as amended by the Water Quality Act of 1965, Public Works and Economic Development Act of 1965, Federal-Aid Highway acts, Vocational Education Act of 1963 and Vocational Education Amendments of 1968.

Subpart A: Contract Work Hours and Safety Standards Act- Safety and Health

1. The contractor shall not require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under construction safety and health standards promulgated by regulations of the Secretary of Labor.

2. The contractor shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327 et seq.).

3. The contractor shall include or cause to be included in each nonexempt subcontract the clauses in (1) and (2) above.

A person who undertakes to perform a portion of a contract involving the furnishing of supplies of materials will be considered a "subcontractor" under section 107 if the work in question involves the performance of construction work and is to be performed: (a) Directly on or near the construction site, or (b) by the employer for the specific project on a customized basis. Thus, a supplier of materials which will become an integral part of the construction is a "subcontractor" if the supplier fabricates or assembles the goods or materials in question specifically for the construction project.

Subpart B: Immigration Reform and Control Act Of 1986

The Contractor agrees by signing this contract that he/she does not and will not during the performance of this contract violate the provisions of the Federal Immigration Reform and Control Act of 1986, which prohibits employment of illegal aliens.
SECTION 00.73.43
WAGE RATE REQUIREMENTS

COMMONWEALTH of VIRGINIA
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

September 16, 2019

Gavin Blevins
Senior Planner
Mount Rogers Planning District Commission
1021 Terrace Drive
Marion, Virginia 24354

Re: ARC POWER Grant # PW-01
Appalachian Trail Center Project
Transmittal of Wage Decision

Dear Mr. Blevins:

You will find enclosed a copy of the U.S. Department of Labor's wage scale applicable to this project. Please be advised Area Rate VA 20190177/Modification 2, dated 4/5/2019, expires when superseded by a new or modified decision. Since the Department of Labor is also using Area Rates published in the Federal Register, the locality must contact this office ten (10) days prior to opening bids to determine if new or modified rates have been issued by the Department of Labor. All new or modified rates published ten (10) days prior to bid opening become applicable to the contract.

Also enclosed are the required Federal Contract Inserts to be incorporated into the construction contracts for this project. As per 41 CFR Part 60-4 published October 3, 1980, the affirmative action goals established for Washington County are:

1) Minorities - 2.6%
2) Females - 6.9%

Prior to bidding, these affirmative action goals must be incorporated in the Federal Contract Inserts in the Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity section along with a description of the project area.

As the Community Development Specialist, if I am not invited to attend the pre-construction conference, the Grant Manager must re-identify the affirmative action goals to the contractor. Additionally, if more than one wage decision is applicable to the project, the Grant

Construction Documents
October 15, 2019

WAGE RATE REQUIREMENTS
00.73.43 - 1 of 2
Manager must also identify which wage decision is applicable to which portions of the construction work to be completed.

Please remember to forward a copy of the Notice of Award and Notice to Proceed with Construction to me. If you have any questions on this matter, please do not hesitate to contact me at (276) 274-8453 or kathi.boatright@dhcd.virginia.gov.

Sincerely,

Kathi Boatright
Community Development Specialist

Enclosure

c:  Dave Collins, McCarty Holsaple McCarty
    Marcia Dempsey, Friends of Southwest Virginia
    Joe Blevins, DHCD

01-01/REV04-18
Superseded General Decision Number: VA20180188

State: Virginia

Construction Type: Building

Counties: Scott and Washington Counties in Virginia. Includes the independent city of Bristol.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was 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 $10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

https://beta.sam.gov/wage-determination/VA20190177/04/05/2019
**Modification Number**

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**Asbestos Worker/Heat & Frost**

**Insulator - Mechanical (Duct, Pipe & Mechanical System Insulation)**

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<td>$35.13</td>
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a. PAID HOLIDAYS: New Year's Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the day after Thanksgiving and Christmas Day provided the employee works the regular work day before and after the paid holiday.

**3010045-003 01/01/2017**

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**3010147-019 11/01/2013**

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**Power Equipment Operator**

- Cranes 90 tons & over
- Capacity; Tower & Climbing Cranes with Controls 100
- ft. above ground............ $28.30 8.69%-+8.15
- Cranes under 90 tons........ $27.30 8.69%-+8.15

**IRON0005-010 05/01/2017**

https://beta.sam.gov/wage-determination/VA20190177/2/document
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<td>PIPEFITTER</td>
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<td>CARPENTER</td>
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<td>IRONWORKER, REINFORCING</td>
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<td>LABORER: Mason Tender - Brick</td>
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<td>LABORER: Pipelayer</td>
<td>$ 12.00</td>
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<td>OPERATOR: Backhoe/Excavator/Trackhoe</td>
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OPERATOR: Bobcat/Skid
Steer/Skid Loader............. $ 18.95 4.03

OPERATOR: Bulldozer............ $ 16.00 0.00

OPERATOR: Forklift............. $ 19.40 7.00

OPERATOR: Loader.............. $ 21.28 3.17

OPERATOR: Roller.............. $ 16.25 4.88

PAINTER (Brush and Roller).... $ 20.01 0.00

PLUMBER...................... $ 21.15 3.92

ROOFER....................... $ 16.17 3.73

SHEET METAL WORKER, Includes
HVAC Duct Installation......... $ 18.38 3.30

TILE FINISHER................... $ 23.48 0.00

TILE SETTER.................... $ 27.80 10.25

TRUCK DRIVER: Dump Truck...... $ 16.58 1.73

=================================

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

=================================

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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) (11)).

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 "identifier" 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,
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
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

https://beta.sam.gov/wage-determination/VA20190177/2/document
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
SECTION 01.10.00
SUMMARY

PART 1 GENERAL

1.01 PROJECT
A. Project Name: Damascus Trail Center.
C. Owner’s Name: The Town of Damascus, Virginia.
D. Architect’s Name: McCarty Holsaple McCarty, Inc.
E. The Project consists of the construction of a new, one-story Trail Center and associated site work to serve as a visitor’s center for the Town and region. Project funding is primarily thru a grant from the Appalachian Regional Commission.

1.02 CONTRACT DESCRIPTION

1.03 OWNER OCCUPANCY
A. Owner intends to occupy the Project immediately upon Substantial Completion.
B. Cooperate with Owner to minimize conflict and to facilitate Owner’s operations.
C. Schedule the Work to accommodate Owner occupancy.

1.04 CONTRACTOR USE OF SITE AND PREMISES
A. Construction Operations: Limited to areas noted on Drawings.
B. Provide access to and from site as required by law and by Owner:
   1. Do not obstruct roadways, sidewalks, or other public ways without permit.
C. Time Restrictions:
   1. Limit conduct of especially noisy exterior work to the hours of 7:00 AM to 6:00 PM.
D. Utility Outages and Shutdown:
   1. Limit shutdown of utility services to 4 hours at a time, arranged at least 72 hours in advance with Owner.
   2. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 09.30.00
SECTION 01.55.26
TRAFFIC CONTROL

PART 1  GENERAL

1.01  REFERENCES
A. VDOT Road and Bridge Specifications, Latest Edition Section – Division VII

1.02  DESCRIPTION
A. Roads and streets in the Project area shall be kept open to all traffic by the Contractor in such condition that both local and through traffic will be adequately and safely accommodated. All construction operations shall be scheduled to keep traffic delays to a minimum.

1.03  REQUIREMENTS INCLUDED
A. Contractor is required to obtain an approved Maintenance of Traffic plan in accordance with VDOT regulations PRIOR to beginning work within the right-of-way. The Contractor shall bear the cost of obtaining an approved M.O.T. Plan and shall include the cost of this process in the bid amount.
B. This work shall cover all of the measures necessary to maintain and to protect traffic, to protect the work in progress, and to project adjacent property from excessive dust generated by public traffic and Contractor’s construction equipment on the public travel lane. The Work shall include labor, materials, and equipment necessary to keep the traveled road smooth; the construction of temporary structures when required; the furnishing and applying of aggregate and dust palliatives; the furnishing and maintenance of signs, auxiliary barriers, channelizing devices, hazard warning lights, barricades, flares, and reflective markers and their prompt removal when the hazard is eliminated; the furnishing of pilot trucks and drivers when needed; and the furnishing of flagmen.
C. All flagmen shall be furnished by the Contractor, and all flagging shall be his responsibility. Flagmen shall be provided at the ends of projects where one-way traffic is required, at limits of one-way traffic lanes, at locations where project construction equipment is required to cross public roads, and at any other locations necessary. O.S.H.A. approved hand signaling devices, orange caps and vest shall be furnished by the Contractor for the use by personnel assigned to traffic control responsibilities. All flagmen shall be certified in accordance with the Virginia Work Area Protection Manual, latest edition.
D. Warning devices, such as signs, auxiliary barriers, channelizing devices, hazard warning lights, barricades, flares, and reflective markers, shall be furnished, erected, and maintained by the Contractor for the protection and guidance of traffic. Devices shall be provided, erected, and maintained at the ends of the project, on roads intersecting the project. All devices shall be in place before work begins, be correctly maintained while in use, and be removed as soon as they are no longer necessary. If the devices do not apply to existing conditions during an intermediate period, they shall be removed or the face completely covered with an opaque weatherproof hood. All devices shall be removed as often as necessary to properly delineate the construction area.
E. If actual field conditions are not illustrated in the Plans, engineering judgment and discretion shall be exercised to select devices that will be adaptable, but the general policies herein prescribed shall be adhered to. Final responsibility for the installation of adequate safety devices for the protection of the traveling public and workmen, as well as for the safeguard of the work in general, shall rest with the Contractor.

1.04 PARKING
A. Contractor shall designate a temporary parking area to accommodate construction. When site space is not adequate, provide additional off-site parking. Locate as approved by Owner.
B. Contractor shall prevent interference with normal traffic patterns and avoid minimize use of existing roads and driveways by construction traffic.
C. Contractor shall not allow heavy equipment or vehicles in existing parking areas. If existing pavement areas are damaged as a result of construction traffic, contractor shall repair in accordance with Section 32 20 00 – Site Restoration.

PART 2 MATERIALS

2.01 SIGNS, WARNING DEVICES, WARNING LIGHTS
A. All traffic control materials shall be in accordance with MUTCD, Latest Edition – Section 7 – Temporary Traffic Control Devices.

PART 3 EXECUTION
NOT USED

END OF SECTION 01.55.26
SECTION 02.41.00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work Included: Provide labor, equipment, and materials to perform demolition as shown on the Drawings including:
   1. Demolition and removal of selected site elements.
   2. Repair procedures for selective demolition operations.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section Include:
   1. Section 00.72.00 – General Conditions
   2. Section 31.10.00 – Site Clearing

1.02 REFERENCES

A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the Contract and as listed in the Specification using abbreviations shown.

B. American National Standards Institute (ANSI):
   1. A10.6: Safety Requirements for Demolition Operations

C. National Fire Prevention Association (NFPA):
   1. 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations

D. Virginia Department of Transportation, Road and Bridge Specifications

E. Virginia Department of Transportation, Work Area Protection Manual


1.03 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 MATERIALS OWNERSHIP

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner’s property, demolished materials shall become Contractor’s property upon issuance of the Notice to Proceed and shall be removed from Project Site.

B. Salvaged Items: Historic items, relics, and similar objects including, but not limited to, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during demolition remain Owner’s property. Carefully remove and...
salvage each item or object in a manner to prevent damage and deliver promptly to Owner. Coordinate with Owner, who will establish special procedures for removal and salvage.

1.05 SUBMITTALS

A. General: Shall be in accordance with Section 01 33 00 – Submittal Procedures.

B. Demolition Plan: Provide a plan outlining the general procedures and sequence to be used in performing demolition. Plan shall include traffic control needs and timing, as well as procedures for environmental and public protection. Plan shall also indicate disposal sites for demolition materials.

C. Hazardous Material Records: If disposal of hazardous materials is required, provide signed manifests from a licensed hauler documenting delivery to a licensed disposal site. Provide a receipt indicating acceptance of materials by a facility licensed to accept hazardous materials.

1.06 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Document that firm has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

D. Pre-demolition Conference: Conduct conference at Project site to review methods and procedures related to selective demolition including, but not limited to, the following:
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review coordination and timing of the Owner’s staged evacuation and partial continued use of the building during demolition and construction operations, if applicable.

1.07 PROJECT CONDITIONS

A. Coordination: Owner will occupy buildings immediately adjacent to selective demolition area. Conduct selective demolition so Owner’s operations will not be disrupted. Provide not less than 72 hours’ written notice to Owner of activities that will affect their operations.

B. Access: Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
   1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Existing Conditions: Owner assumes no responsibility for condition of areas to be selectively demolished.
   1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

E. Removed Items: Storage or sale of removed items or materials on-site will not be permitted.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that utilities have been disconnected and capped.
B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
C. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 CLEARING AND GRUBBING
A. Generally, Site Clearing is one of the first phases of demolition to occur onsite. Perform in accordance with Section 31 10 00 – Site Clearing where necessary. Contractor shall ensure that primary erosion and sediment control measures are installed properly before beginning Site Clearing.

3.03 UTILITY SERVICES
A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
   1. Provide at least 72 hours written notice to Owner if shutdown of service is required during changeover.
C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
   1. Owner will arrange to shut off indicated public utilities when requested by Contractor.
   2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition, provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to adjacent buildings.
   3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.04 PREPARATION
A. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, acids, flammables, or other dangerous materials before proceeding with selective demolitions operations.
B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by the Owner or governing regulations.

2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by the Owner or authorities having jurisdiction.

3. Protect existing site improvements, appurtenance, and landscaping to remain.

C. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around demolition area.

3.05 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Street must be swept clean at the end of each day. Any unsafe materials on the street must be removed immediately.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.06 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, and in accord with the approved demolition plan.

2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

3. Maintain adequate ventilation when using cutting torches.

4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

5. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

7. Dispose of demolished items and materials promptly.

8. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

C. Concrete and Pavement:
1. Where selective demolition is required, demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
2. Remove pavements and structures by methods that will not damage underground utilities. Do not use drop hammer near existing underground utilities.
3. Minimize amount of earth loaded during removal operations.
4. Where existing pavement is to remain, make straight saw cuts in existing pavement to provide clean breaks prior to removal. Do not break concrete pavement or base with drop hammer unless concrete or base has been saw cut to minimum depth of 2 inches.
5. When street and driveway saw cut location is greater than one-half of pavement lane width, remove pavement for full lane width or to nearest longitudinal joint as directed by Engineer.
6. Remove sidewalks and curbs to nearest existing dummy, expansion, or construction joint.
7. Pavement directly in front of driveways and sidewalks shall not be removed more than 72-hours prior to installation of water line or other utilities, unless otherwise approved by Engineer.

D. Masonry: Where selective demolition is required, demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

E. Concrete Slabs-On-Grade: Excluding basement slabs-on-grade, saw-cut perimeter of area to be demolished and then break up and remove.

3.07 BLASTING
A. General: The use of explosives will not be permitted.

3.08 PATCHING AND REPAIRS
A. General: Promptly repair damage to adjacent construction caused by selective demolition operations. Replace adjacent areas to existing conditions or better as documented in preconstruction photographs and according to Section 32 20 00 – Site Restoration.

B. Excavations: Upon removal of debris, promptly fill all excavations to prevent the accumulation of water.

3.09 DISPOSAL OF DEMOLISHED MATERIALS
A. General: Rubbish and debris shall be removed from the site daily unless otherwise directed.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner’s property and legally dispose of them.

END OF SECTION 02.41.00
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Work Included: Provide cast-in-place concrete, including formwork and reinforcement and finishes, where shown on the Plans, as specified herein, and as needed for a complete and proper installation.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7 – Shop Drawings
   2. Section 01.66.00 - Product Delivery, Storage, and Handling Requirements
   3. Section 32.10.00 - Bases, Ballasts, and Pavements
   4. Section 33.03.00 - Utility Pipe and Materials

1.02 REFERENCES
A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

B. American National Standards Institute (ANSI)/American Concrete Institute (ACI):
   1. 301: Specifications for Structural Concrete
   2. 303R: Guide to Cast-in-Place Architectural Concrete Practice
   3. 304.2R: Placing Concrete by Pumping Methods
   4. 306R: Cold Weather Concreting
   5. 315: Details and Detailing of Concrete Reinforcement
   6. 318: Building Code Requirements for Structural Concrete and Commentary
   7. 347R: Guide to Formwork for Concrete
   8. 350R: Environmental Engineering Concrete Structures

C. American Society for Testing and Materials (ASTM):
   1. A185: Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
   2. A615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   4. C31/31M: Standard Practice for Making and Curing Concrete Test Specimens in the Field
   5. C33: Specification for Concrete Aggregates
   10. C172: Standard Practice for Sampling Freshly Mixed Concrete
   12. C231: Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
16. D448: Standard Classification for Sizes of Aggregate for Road and Bridge Construction

D. Concrete Reinforcing Steel Institute (CRSI):

E. Virginia Department of Transportation Road and Bridge Specifications (VDOT):
   1. 217: Hydraulic Cement Concrete

1.03 SUBMITTALS

A. General: Shall be in accordance with Section 01 3300 – Submittal Procedures.

B. Mix Designs:
   1. Within 30 calendar days after award of the Contract, and prior to proceeding with any concrete work, Contractor shall secure concrete mix designs from the concrete supplier, and submit to the Engineer for review and approval.
   2. Distribute approved mix designs to testing laboratory, batch plant, job site, and governmental agencies having jurisdiction.

1.04 QUALITY ASSURANCES

A. Contractor Responsibilities:
   1. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
   2. Provide access for, and cooperate with, the Owner’s representative and Owner’s testing laboratory.
   3. Do not commence placement of concrete until mix designs has been reviewed and approved by the Engineer and all governmental agencies having jurisdiction, and until copies of the approved mix designs are at the job site and the batch plant.

B. Batch Tickets: Batch tickets shall be provided for each truck of concrete delivered to the job site. Tickets shall include the following information:
   1. Quantity of batch
   2. Time the cement was injected into the mix
   3. Batch number
   4. Water withheld at the plant (if any)
   5. Admixtures and quantities of admixtures injected at plant
   6. Driver’s name
   7. Time of truck’s departure from the plant

C. Batch Ticket Log: A log of all batch tickets shall be kept by the testing agency and provided to the Owner’s Representative following each concrete pour. Results of field testing shall also be recorded on the Log including:
   1. Time of truck’s arrival at the job site
   2. Time of discharge of contents at job site
   3. Concrete temperature
4. Air content
5. Slump
6. Type and quantity of all additives added at job site

1.05 DELIVERY, STORAGE AND HANDLING
   A. General: Material shall be delivered and stored so as to minimize the potential for damage to
      the material. The Contractor shall take special care to protect pipe from the elements as
      directed by the manufacturer. Material shall be in accordance with Section 01 6600 – Product
      Delivery, Storage, and Handling Requirements.

PART 2 PRODUCTS

2.01 FORMS
   A. General: Reference Section 32 1000 - Bases, Ballasts, and Pavements for sidewalk, curbing,
      curb and gutter, and concrete paving formwork requirements.

2.02 REINFORCEMENT
   A. General: Reinforcement materials and installation shall conform to the applicable sections
      of the latest version or revision of ACI 301, except as modified by the Supplemental
      Requirements listed below.
   B. Strength: Reinforcement shall be of the size shown on the plans with all bars being billet
      steel. Welded wire fabric gauge and mesh size and FiberMesh 300 shall be as shown on the
      plans.
   C. Spacing: The clear distance between parallel bars shall not be less than the nominal diameter
      of the bars, 1-1/3 times the maximum size of the coarse aggregate, not 1 inch. All main
      reinforcement shall be spaced not less than 2 inches from any concrete surface unless
      authorized or indicated on the plans. Clearance between ground and rebar shall be a
      minimum of 3 inches. For stirrups, spacer rods and similar secondary reinforcement, this
      clearance may be reduced by the diameter of such rods.
   D. Splicing: Where splicing of bars is necessary, the minimum length of the splice shall be 30
      diameters of the largest bar, unless shown to be otherwise on plans.
   E. Hooks and Bends: When a hook is indicated on the plans, it shall mean either a 180 degree
      turn plus an extension of at least 4 bar diameters, or a 90 degree turn plus an extension of at
      least 6 bar diameters.
   F. Quality Assurance: Comply with the following as minimums:
      1. Bars: ASTM A615, grade 60 unless otherwise shown on the plans using deformed bars for
         number 3 and larger.
      3. Bending of rebar shall be in accordance with ACI 318.
      4. Supports for reinforcement: Supports for reinforcing bars and welded wire fabric shall
         comply with CRSI recommendations, including bolsters, chairs and spacers. Wire bar
         supports shall be rust protected in accordance with CRSI Class 2. Under no circumstances
         will rebar or other metal pins driven into the ground to support reinforcing steel be
         allowed.
      5. Fabricate reinforcement to the required shapes and dimensions, within fabrication
6. Reinforcement: Do not use reinforcement having any of the following defects:
   (a) Bar lengths, depths, or bends exceeding the specified fabricating tolerances.
   (b) Bends or kinks not indicated on the plans or required for this work.
   (c) Bars with cross-section reduced due to excessive rust or other causes.
7. Contractor shall fabricate reinforcement to the required shapes and dimensions, within
   fabrication tolerances stated in the CRSI “Manual of Standard Practices”.

2.03 CONCRETE

A. General: Concrete work shall conform to all requirements of ACI 301 and ACI 350R, except as
   modified by supplemental requirements below.

B. Strength: Concrete shall have a minimum allowable compressive strength of 4000 psi at 28
   days (ACI 301, 3.2).

C. Admixtures: Admixtures may be used to enhance concrete handling, workability and strength
   characteristics if approved by the Engineer prior to use, and meet the requirements of ACI
   301, 2.2. The Engineer shall be notified of any admixtures proposed for use at least two
   weeks prior to placement of concrete.
   1. Provide admixtures that contain not more than 0.1 percent chloride ions.
   2. Use air-entraining admixture per ASTM C260 in exterior exposed concrete, providing not
      less than 4.5 percent and not more than 7 percent entrained air for concrete exposed to
      freezing and thawing.
   3. Use water-reducing, accelerating, and retarding admixtures per ASTM C494 that have been
      tested and accepted in mix designs in strict compliance with manufacturer’s directions.

D. Watertight Concrete: All concrete used in the construction of this project shall be considered
   as watertight concrete with water-cement ratios and other parameters not exceeding those
   specified for watertight concrete (ACI 301, 3.4.2) unless indicated to be otherwise on the
   plans.

E. Materials and Testing: Contractor shall comply with the following as minimums:
   1. Portland cement: 4,000 psi ASTM C150, Type I or II. Low alkali cement shall be used where
      aggregates are alkali reactive.
   2. Aggregate, shall meet requirements of ASTM C33 and be uniformly graded and clean.
      Aggregate shall be tested in accordance with ASTM C29. Do not use aggregate known to
      cause excessive shrinkage.
   3. Aggregate, coarse: Crushed rock or washed gravel with minimum size between 3/4 inch
      and 1-1/2 inch, and with a maximum size Number 4.
   4. Aggregate, fine: Natural washed sand of hard and durable particles varying from fine to
      particles passing a 3/8 inch screen, of which at least 12 percent shall pass a 50 mesh screen.
   5. Provide concrete with compressive strengths shown on the plans. When such strengths are
      not shown on the plans, provide the following as minimums:
      (a) Concrete footings: 4000 psi
      (b) Watertight Structures: 4000 psi
      (c) Sidewalks: 4000 psi
   6. Slump Limits: Design mixes shall result in concrete slump at point of placement of not less
      than 2 inches and not more than 4 inches. If the approved mix design includes the use of
      admixtures which affect slump, slump at point of placement shall comply with mix design.
PART 3 EXECUTION

3.01 SURFACE CONDITIONING
A. Contractor’s Responsibility: Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 SUBBASE
A. General: Reference plan details for stone base requirements.

3.03 REINFORCING
A. Installation: Comply with the following, as well as the specified standards, for details and methods of reinforcing placement and supports.
1. Clean reinforcement and remove loose dust and mill scale, earth, and other materials which reduce bond or destroy bond with concrete.
2. Position, support, and secure reinforcement against displacement by forms, construction, and the concrete placement operations.
3. Place reinforcement to obtain the required coverage for concrete protection as specified by ACI 301.
4. Install welded wire fabric in as long lengths as practicable, lapping adjoining pieces one full mesh minimum.
5. Dowels shall match reinforcement with which they lap unless noted.
6. Unless otherwise shown on the plans, or required by governmental agencies having jurisdiction, or mechanical lap type splices are used, overlap bars per paragraph 2.2.4 (splicing) of this specification. Mechanical lap devices shall be approved by the Engineer prior to use.
7. Do not field bend reinforcement without written permission of the Engineer. In no case may bars be heated to facilitate bending.
8. Welding, oxy-acetylene torch cutting, or the application of heat to reinforcing steel, anchor bolts, or any metal object embedded in concrete is strictly forbidden unless approved in writing by the Engineer.

3.04 MIXING CONCRETE
A. Requirements:
1. Transit-mix the concrete in accordance with provisions of ASTM C94.
2. Mixing Water:
   (a) A maximum of 2-1/2 gallons of water per cubic yard of concrete, may be withheld at the batch plant.
   (b) Upon arrival at the job site, add all or part of the withheld water (as required for proper slump) before the concrete is discharged from the mixer.
   (c) Mix not less than five minutes after the withheld water has been added, and not less than one minute of that time immediately prior to discharge of the batch.
   (d) Unless otherwise directed, provide at least 15 minutes total mixing time per batch after first addition of water.
3. Do not use concrete that has stood for over 30 minutes after leaving the mixer, or concrete that is not placed within 60 minutes after water is first introduced into the mix. Plasticizers or other admixtures shall not be used unless prior approval from the Engineer has been
obtained. Maximum time between introduction of cement to mixture and discharge shall be in accordance with VDOT 217.

3.05 PLACING CONCRETE

A. Preparation:
   1. Remove foreign matter accumulated in the forms.
   2. Rigidly close openings left in the formwork.
   3. Wet wood forms sufficiently to tighten up cracks. Wet other material sufficiently to maintain workability of the concrete.
   4. Use only clean tools.

B. Conveying:
   1. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.
   2. Deposit concrete as nearly as practicable in its final location so as to avoid separation due to re-handling and flowing.
   3. Do not use concrete which becomes non-plastic and unworkable, does not meet required quality control limits, or has been contaminated by foreign materials.
   4. Remove rejected concrete from the job site.

C. Cold Weather Placement:
   1. All concrete work shall be protected from damage or reduced strength which could be caused by freezing actions or low temperatures. All work with concrete mixture when air temperature is below 40 degrees F shall comply with ACI 306R and as specified herein.
   2. Do not use antifreeze agents or chemical accelerators, unless written approval for such use has been given by the Engineer.
   3. Do not use aggregates that contain ice or snow. Do not place concrete over frozen soils or subgrade.
   4. If air temperatures have fallen below 40 degrees F, or are expected to fall below 40 degrees F within twenty-four hours, heat water and all aggregates before mixing. Concrete mixture temperature at point of placement shall not be less than 60 degrees F nor more than 80 degrees F.

3.06 CONSOLIDATION

A. General:
   1. Consolidate each layer of concrete immediately after placing, by use of internal concrete vibrators supplemented by hand spading, rodding, or tamping.
   2. Do not vibrate forms or reinforcement.
   3. Do not use vibrators to transport concrete inside the forms.

3.07 CONCRETE CURING

A. General: Concrete curing shall be done with accordance with ACI 303R. Cold weather curing shall be in accordance with ACI 306R.

3.08 JOINTS

A. Expansion Joints: Expansion joints are to be provided at locations shown on the plans or at other locations during construction as approved by the Owner’s Representative. Joints shall be filled with a premolded expansion joint filler complying with ASTM D1751.
B. Construction Joints: Construction joints shall be provided as shown on the plans or as preapproved by the Owner’s Representative or Architect/Engineer. Joints shall be kept free of form oil or other materials which may hamper bonding. Soiled surfaces shall be washed, mechanically cleaned or brushed blasted to the satisfaction of the Architect/Engineer. A surface bonding agent similar to Larsen Products “Weld Crete” shall be applied at all joints in accordance with the manufacturer’s recommendation.

1. Do not use construction joints except as shown on the plans.
2. If additional construction joints are found to be required, secure the Architect/Engineer’s approval of joint design and location prior to start of concrete placement.

3.09 CONCRETE FINISHING
A. General: All exposed concrete surfaces shall receive as a minimum, a smooth rubbed or grout cleaned finish conforming to ACI 301. Alternative methods of finishing concrete, such as an application of a concrete finish/sealer such as Thoroseal or similar product, shall be acceptable if approved by the Architect/Engineer.

3.10 REMEDIAL WORK
A. General: Repair or replace deficient work as directed by the Architect/Engineer and at no additional cost to the Owner.

3.11 TESTING
A. General: An independent testing agency shall be provided by the Owner. The Contractor shall provide the qualifications of proposed materials and mix designs as well as other testing services specifically required of the Contractor. Testing services to be provided by the Contractor shall include the following:

1. Additional testing and inspection required because of changes in materials or proportions requested by the Contractor.
2. Additional testing of materials or concrete occasioned by their failure by test or inspection to meet specification requirements.
3. The Contractor shall provide the materials, tools and labor necessary to prepare the test specimens and deliver them to the testing agency. The Owner’s testing agency shall conduct the slump test and the compressive strength testing of cylinders.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cubic yards or fraction thereof of each concrete mix placed each day.
   (a) When frequency of testing will provide a fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143; one test at point of placement for each composite sample, but not less than one test for each day’s pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C231, pressure method for normal-weight concrete; ASTM C173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day’s pour of each concrete mix.
4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test specimens: ASTM C31/C31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C39; test two laboratory-cured specimens at 7 days and two at 28 days. Test two field-cured specimens at 7 days and two at 28 days. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

C. Concrete Strength: Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

END OF SECTION 03.30.01
SECTION 04.05.11
MORTAR AND MASONRY GROUT

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Mortar for masonry.
   B. Grout for masonry.

1.02 RELATED REQUIREMENTS
   A. Section 04.20.00 - Unit Masonry: Installation of mortar and grout.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.

C. Samples: Submit two samples of mortar, illustrating mortar color and color range.

D. Reports: Submit reports on mortar indicating compliance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.

E. Reports: Submit reports on grout indicating compliance of component grout materials to requirements of ASTM C476 and test and evaluation reports to requirements of ASTM C1019.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of Contract Documents.

1.06 DELIVERY, STORAGE AND HANDLING

A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.07 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.

   1. Exterior Masonry Veneer: Type N.
   2. Exterior, Non-loadbearing Masonry: Type N.
   3. Interior, Non-loadbearing Masonry: Type O.

C. Grout Mix Designs:
   1. Bond Beams and Lintels: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
      a. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
      b. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.02 MATERIALS

A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
   1. Type: Type N.
   2. Color: Mineral pigments added as required to produce approved color sample.
3. Water repellent mortar for use with water repellent masonry units.

B. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.

C. Portland Cement: ASTM C150/C150M.
   1. Type: Type I - Normal; ASTM C150/C150M.
   2. Color: Color as required to produce approved color sample.

D. Masonry Cement: ASTM C91/C91M.
   1. Type: Type N; ASTM C91/C91M.
   2. Colored Mortar: Premixed cement as required to match Architect’s color sample.

E. Hydrated Lime: ASTM C207, Type S.

F. Quicklime: ASTM C5, non-hydraulic type.

G. Mortar Aggregate: ASTM C144.

H. Grout Aggregate: ASTM C404.

I. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
   1. Color(s): As selected by Architect from manufacturer's full range.

J. Water: Clean and potable.

K. Accelerating Admixture: Nonchloride type for use in cold weather.

L. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Colored Mortar: Proportion selected pigments and other ingredients to match Architect’s sample, without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions, uniform in coloration.

D. Add admixtures in accordance with manufacturer’s instructions; mix uniformly.

E. Do not use anti-freeze compounds to lower the freezing point of mortar.

F. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING

A. Mix grout in accordance with ASTM C94/C94M.

B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.

C. Add admixtures in accordance with manufacturer’s instructions; mix uniformly.

D. Do not use anti-freeze compounds to lower the freezing point of grout.

2.05 PRECONSTRUCTION TESTING

A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01.43.25.
B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.

C. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.

PART 3 EXECUTION

3.01 PREPARATION

A. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

A. Install mortar and grout to requirements of section(s) in which masonry is specified.
B. Work grout into masonry cores and cavities to eliminate voids.
C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
D. Do not displace reinforcement while placing grout.
E. Remove excess mortar from grout spaces.

3.03 GROUTING

A. Perform all grouting by means of low-lift technique. Do not employ high-lift grouting.
B. Low-Lift Grouting:
   1. Limit height of pours to 12 inches.
   2. Limit height of masonry to 16 inches above each pour.
   3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
   4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field tests, in accordance with provisions of Section 01.43.25.
B. Test and evaluate mortar in accordance with ASTM C780 procedures.
   1. Test with same frequency as specified for masonry units.
C. Test and evaluate grout in accordance with ASTM C1019 procedures.
   1. Test with same frequency as specified for masonry units.
D. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314, and for flexural bond strength in accordance with ASTM C1072 or ASTM E518/E518M; perform tests and evaluate results as specified in individual masonry sections.

END OF SECTION 32.92.19
SECTION 04.20.00
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Concrete block.
   B. Reinforcement and anchorage.
   C. Flashings.
   D. Accessories.

1.02 RELATED REQUIREMENTS
   A. Section 04.05.11 - Mortar and Masonry Grout.
   B. Section 07.92.00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS
   D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
   K. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
   N. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale); 2014.


U. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.


1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Manufacturer’s Certificate: Certify that masonry units meet or exceed specified requirements.

D. Manufacturer’s Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

E. Test Reports: Concrete masonry manufacturer’s test reports for units with integral water repellent admixture.

1.06 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of Contract Documents.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
   2. Special Shapes: Provide non-standard blocks configured for corners.
   3. Load-Bearing Units: ASTM C90, normal weight.
a. Hollow block, as indicated.
b. Exposed Faces: Manufacturer's standard color and texture where indicated.
a. Hollow block, as indicated.

2.02 MORTAR AND GROUT MATERIALS
A. Mortar and Grout: As specified in Section 04.05.11.

2.03 REINFORCEMENT AND ANCHORAGE
A. Manufacturers:
   1. Hohmann & Barnard, Inc (including Dur-O-Wal brand); 2-Seal Thermal Wing-Nut @ metal
      studs and 2-Seal Thermal Concrete @ concrete walls: www.h-b.com.
B. Reinforcing Steel: Type specified in Section 03.20.00; size as indicated on drawings;
galvanized finish.
C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is
   involved and truss type elsewhere, unless otherwise indicated.
D. Single Wythe Joint Reinforcement: Truss or ladder type; ASTM A1064/A1064M steel wire, mill
galvanized to ASTM A641/A641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods;
   width as required to provide not more than 1 inch and not less than 1/2 inch of mortar
   coverage on each exposure.
E. Adjustable Multiple Wythe Joint Reinforcement: Truss type with adjustable ties or tabs
   spaced at 16 in on center and fabricated with moisture drip; ASTM A1064/A1064M steel wire,
   hot dip galvanized after fabrication to ASTM A153/153M, Class B; 0.1875 inch side rods with
   0.1483 inch cross rods and adjustable components of 0.1875 inch wire; width of components
   as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage
   from each masonry face.
   1. Vertical adjustment: Not less than 2 inches.
   2. Seismic Feature: Provide lip, hook, or clip on extended leg of wall ties to engage or enclose
      not less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.
   3. Insulation Clips: Provide clips at tabs or ties designed to secure insulation against outer face
      of inner wythe of masonry.
F. Two-Piece Wall Ties: Formed steel wire, 0.1875 inch thick, adjustable, eye and pintle type, hot
   dip galvanized to ASTM A 153/A 153M, Class B, sized to provide not less than 5/8 inch of
   mortar coverage from masonry face and to allow vertical adjustment of up to 1-1/4 in.
G. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between
   masonry veneer and structural backup, hot dip galvanized to ASTM A153/A153M, Class B.
   1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup
      through sheathing by two fasteners; provide design with legs that penetrate sheathing and
      insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
   3. Vertical adjustment: Not less than 3-1/2 inches.
   4. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less
      than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.
H. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.
B. Verify that related items provided under other sections are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.
B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.

3.05 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.
B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
C. Remove excess mortar and mortar smears as work progresses.
D. Interlock intersections and external corners, except for units laid in stack bond.
E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
G. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
H. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 REINFORCEMENT AND ANCHORAGE – SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16 inches on center.
B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
C. Place continuous joint reinforcement in first and second joint below top of walls.
D. Lap joint reinforcement ends minimum 6 inches.

3.07 MASONRY FLASHINGS
A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 1 inch, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.
B. Extend metal flashings flush with exterior face of masonry.
C. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.08 GROUTED COMPONENTS
A. Lap splices minimum 24 bar diameters.
B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
C. Place and consolidate grout fill without displacing reinforcing.
D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.09 CONTROL AND EXPANSION JOINTS
A. Do not continue horizontal joint reinforcement through control or expansion joints.
B. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.
C. Form expansion joint as detailed on drawings.

3.10 TOLERANCES
A. Maximum Variation from Alignment of Columns:  1/4 inch.
B. Maximum Variation From Unit to Adjacent Unit:  1/16 inch.
C. Maximum Variation from Plane of Wall:  1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
D. Maximum Variation from Plumb:  1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
E. Maximum Variation from Level Coursing:  1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
F. Maximum Variation of Mortar Joint Thickness:  Head joint, minus 1/4 inch, plus 3/8 inch.
G. Maximum Variation from Cross Sectional Thickness of Walls:  1/4 inch.
3.11 CUTTING AND FITTING
   A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
   B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 FIELD QUALITY CONTROL
   A. An independent testing agency will perform field quality control tests, as specified in Section 01.43.25.
   B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67/C67M requirements, sampling 5 randomly chosen units for each 50,000 installed.
   C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.13 CLEANING
   A. Remove excess mortar and mortar droppings.
   B. Replace defective mortar. Match adjacent work.
   C. Clean soiled surfaces with cleaning solution.
   D. Use non-metallic tools in cleaning operations.

3.14 PROTECTION
   A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION 04.20.00
SECTION 05.51.00
METAL LADDERS AND RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Structural steel ladder framing and supports.
B. Handrails and guards.

1.02 RELATED REQUIREMENTS
A. Section 03.30.00 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
B. Section 05.54.00 - Cold-Formed Metal Framing.
C. Section 06.10.00 – Rough Carpentry:

1.03 REFERENCE STANDARDS
E. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2009.
F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
J. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
K. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS
A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
C. Welders’ Certificates.
1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Virginia, or personnel under direct supervision of such an engineer.

B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months

PART 2 PRODUCTS

2.01 METAL LADDER

A. Metal Ladder: Provide ladder of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
   1. Regulatory Requirements: Provide ladder treads and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.
   2. Dimensions: As indicated on drawings.
   3. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
   4. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
   5. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:
   1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
      a. Welded Joints: Continuously welded and ground smooth and flush.
      b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
      c. Exposed Edges and Corners: Eased to small uniform radius.
      d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

E. Finish: Shop or factory-prime painted.

F. Under Side of Ladder: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.02 HANDRAILS AND GUARDS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.

C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.
D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: See drawings for configurations and heights.
   1. Top Rails and Wall Rails: 1-1/2 inches diameter, round, unless indicated otherwise.
   2. Posts: 1-1/2 inches diameter, round, unless indicated otherwise.
   3. Balusters: 1/2 inch square solid bar, unless indicated otherwise.

F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
   1. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
   2. For anchorage to stud walls, provide backing plates, for bolting anchors.

2.03 MATERIALS

A. Steel Sections: ASTM A 36/A 36M.
B. Steel Tubing: ASTM A500 or ASTM A501 structural tubing, round and shapes as indicated.
C. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
D. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
   1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
   2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
E. Steel Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
F. Steel Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
G. Welding Materials: AWS D1.1; type required for materials being welded.
H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.04 SHOP FINISHING

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
B. Do not prime surfaces in direct contact with concrete or where field welding is required.
C. Prime Painting: Use specified shop- and touch-up primer.
   1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
   2. Number of Coats: One.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. When field welding is required, clean and strip primed steel items to bare metal.
B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.03 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects.
B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1.
E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
F. Obtain approval prior to site cutting or creating adjustments not scheduled.
G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION 05.51.00
SECTION 06.10.00  
ROUGH CARPENTRY  

PART 1  GENERAL  

1.01  SECTION INCLUDES  
A. Structural dimension lumber framing.  
B. Non-structural dimension lumber framing.  
C. Rough opening framing for doors, windows, and roof openings.  
D. Sheathing.  
E. Underlayment.  
F. Roofing nailers.  
G. Preservative treated wood materials.  
H. Miscellaneous framing and sheathing.  
I. Communications and electrical room mounting boards.  
J. Concealed wood blocking, nailers, and supports.  
K. Miscellaneous wood nailers, furring, and grounds.  

1.02  RELATED REQUIREMENTS  
A. Section 07.25.00 - Weather Barriers: Water-resistive barrier over sheathing.  
B. Section 09.21.16 - Gypsum Board Assemblies: Gypsum-based sheathing.  

1.03  REFERENCE STANDARDS  
J. PS 1 - Structural Plywood; 2009.  
K. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.  
M. SPIB (GR) - Grading Rules; 2014.
1.04 SUBMITTALS
   A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
   B. Product Data: Provide technical data on wood preservative materials, application instructions, and wood.
   C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE AND HANDLING
   A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.06 WARRANTY
   A. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
   A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
      1. Species: Douglas Fir-Larch, Spruce-Pine, or Southern Pine unless otherwise indicated.
      2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
   A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
   B. Sizes: Nominal sizes as indicated on drawings, S4S.
   C. Moisture Content: Interior framing and blocking S-Dry or MC19; Exposed Exterior Framing - Kiln Dried After Treatment (KDAT).
   D. Stud Framing (2 by 2 through 2 by 6):
      1. Species: Douglas Fir-Larch or Spruce Pine Fir #2
      2. Grade: No. 2.
   E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
      1. Species: Any allowed under grading rules.
      2. Grade: No. 1 & Btr.
   F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
      1. Lumber: S4S, No. 2 or Standard Grade.
      2. Boards: Standard or No. 3.

2.03 EXPOSED BOARDS
   A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
   B. Moisture Content: Kiln-dry (15 percent maximum).
C. Surfacing: S4S.
D. Species: Douglas Fir.
E. Grade: No. 2.

2.04 CONSTRUCTION PANELS
A. Roof Sheathing: Any PS 1 type, rated Structural I Sheathing.
   2. Span Rating: 24
   3. Performance Category: 3/4 PERF CAT.
B. Wall Sheathing, For wall sheathing: Plywood, PS 1, Grade C-C, Exterior Exposure.
C. Wall Sheathing: Gypsum, complying with requirements of ASTM C1396/C1396M for gypsum sheathing, V-shaped long edges, 5/8" inch.
D. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
E. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Other Locations: PS 1, C-D Plugged or better.

2.05 ACCESSORIES
A. Fasteners and Anchors:
   1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, galvanized or unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry.
B. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.
C. Building Paper: Water resistant felt paper to separate pressure treated wood from metal deck and studs.

2.06 FACTORY WOOD TREATMENT
A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer’s stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
B. Preservative Treatment:
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
b. Treat lumber exposed to weather.
c. Treat lumber in contact with roofing, flashing, or waterproofing.
d. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION
A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.
B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
C. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL
A. Select material sizes to minimize waste.
B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS AND SUPPORTS
A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim. Blocking to withstand 200 plf applied in any direction.
B. In metal stud walls, provide continuous treated blocking around exterior door and window openings for anchorage of frames, securely attached to stud framing.
C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
E. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Wall paneling and trim.

3.04 INSTALLATION OF CONSTRUCTION PANELS
A. Roof Sheathing, where occurs: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1. Screw panels to framing; staples are not permitted.
B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

3.05 CLEANING
A. Waste Disposal: Comply with the requirements of Section 01.74.19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.
B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06.10.00
SECTION 06.15.33
WOOD PATIO DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Wood decking.
   B. Stairs for elevated decks.
   C. Railings for elevated decks.

1.02 RELATED REQUIREMENTS
   A. Refer to drawings for sheet metal flashings on tops of deck framing and ledgers.
   B. Refer to Section 05.51.00 – Metal Ladders and Railings for deck railings.

1.03 DEFINITIONS
   A. Boards: Lumber of less than 2 inches nominal in thickness and 2 inches nominal or greater in width.
   B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
   C. Timber: Lumber of 5 inches nominal or greater in least dimension.
   D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
      2. NLGA: National Lumber Grades Authority.
      3. RIS: Redwood Inspection Service.

1.04 SUBMITTALS
   A. Product Data: For preservative-treated wood products, and metal framing anchors.
      1. For preservative-treated wood products. Include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
      2. For metal framing anchors. Include installation instructions.
   B. Material Certificates:
      1. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
   C. Certificates of Inspection: Issued by lumber grading agency for exposed wood products not marked with grade stamp.

1.05 DELIVERY, STORAGE AND HANDLING
   A. Store materials under cover and protected from weather and contact with damp or wet surfaces. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
PART 2 PRODUCTS

2.01 LUMBER, GENERAL

A. Comply with DOC PS 20 and with grading rules of lumber grading agencies certified by ALSC’s Board of Review as applicable. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by ALSC's Board of Review.
   1. Factory mark each item with grade stamp of grading agency.
   2. For items that are exposed to view in the completed Work, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
   3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
   4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content:
   1. Boards: 19 percent.
   2. Dimension Lumber: 19 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness.
   3. Timber: 19 percent.

2.02 WOOD DECKING AND STAIR TREADS

A. Hand select wood for freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot holes, shake, splits, torn grain, and wane.

B. Dimension Lumber Decking: No. 2 grade of the following species:
   1. Mixed southern pine; SPIB.

C. Board Decking: Shall be 1-1/4-inch actual thickness radius-edged decking as indicated or to match existing construction dimensions and be of any of the following species and grades:
   1. Southern pine, No. 1 grade; SPIB.

D. Board Stair Treads: Shall be 1-1/4-inch actual thickness as indicated or to match existing construction dimensions, stepping with half-round or rounded-edge nosing and one of the following species and grades:
   1. Southern pine, No. 1 grade; SPIB.

2.03 DIMENSIONAL LUMBER FRAMING

A. Deck and Stair Framing: No. 2 grade and the following species:
   1. Mixed southern pine; SPIB.

2.04 POSTS

A. Dimension Lumber Posts: No. 2 grade and the following species:
   1. Mixed southern pine; SPIB.

B. Timber Posts: No. 2 grade and the following species:
   1. Mixed southern pine; SPIB.
2.05 PRESERVATIVE TREATMENT

A. Pressure treat boards and dimension lumber with waterborne preservative according to AWPA U1; Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

B. Pressure treat timber with waterborne preservative according to AWPA U1; Use Category UC4a.

C. Pressure treat poles with waterborne preservative according to AWPA U1; Use Category UC4a.

D. Preservative Chemicals: Acceptable to authorities having jurisdiction.
   1. Do not use chemicals containing arsenic or chromium.

E. Use process for boards and dimension lumber that does not include water repellents or other substances that might interfere with application of indicated finishes.

F. After treatment, redry boards, dimension lumber, timber, and poles to 19 percent maximum moisture content.

G. Application: Treat all wood unless otherwise indicated.

2.06 FASTENERS

A. General: Provide fasteners of size and type indicated, acceptable to authorities having jurisdiction, and that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
   1. Use fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or ASTM F 2329 unless otherwise indicated.

B. Nails: ASTM F 1667.

C. Power-Driven Fasteners: ICC-ES AC70.


2.07 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Simpson Strong-Tie Co., Inc.

B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated on Drawings. Manufacturer’s published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.


D. Joist Hangers: As indicated at minimum shall be, U-shaped, with 2-inch-long seat and 1-1/4-inch-wide nailing flanges at least 85 percent of joist depth.

E. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.

F. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports shall be as indicated.
PART 3 EXECUTION

3.01 EXAMINATION
A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. Clean substrates of projections and substances detrimental to application.
B. Prime wood indicated to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Section 09 90 00 "Painting and Coatings."
C. Stain wood indicated to be stained, including both faces and edges. Cut to required lengths and stain ends. Comply with requirements in Section 09 90 00 "Painting and Coatings."

3.03 INSTALLATION, GENERAL
A. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit work to other construction; scribe and cope as needed for accurate fit.
B. Framing Standard: Comply with AF&PA WCD1 unless otherwise indicated.
C. Install wood decking and stair treads with crown up (bark side down).
D. Install metal framing anchors to comply with manufacturer's written instructions.
E. Do not splice structural members between supports unless otherwise indicated.
F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of members or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
H. Apply copper naphthenate field treatment to comply with AWPA M4, to cut surfaces of preservative-treated lumber.
I. Securely attach exterior rough carpentry work to substrate by anchoring and fastening as indicated.
J. Use common wire nails unless otherwise indicated. Select fasteners of size that do not fully penetrate members where opposite side is exposed to view. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads unless otherwise indicated.
K. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced and with adjacent rows staggered.

3.04 ELEVATED DECK JOIST FRAMING INSTALLATION
A. General: Install joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists where framed into wood supporting members by using wood ledgers as indicated or, if not indicated, by using metal joist hangers. Do not notch joists.
B. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches.

C. Lap members framing from opposite sides of beams or girders not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.

3.05 STAIR INSTALLATION

A. Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:
   1. Stringer Size: 2 by 12 inches nominal, minimum.
   2. Notching: Notch stringers to receive treads, risers, and supports; leave at least 5 inches of effective depth.
   3. Stringer Spacing: At least three stringers for each 36-inch clear width of stair.

B. Provide stair framing with no more than 3/8-inch variation between adjacent treads and risers and no more than 1/2-inch variation between largest and smallest treads and risers within each flight.

END OF SECTION 06.15.33
SECTION 06.20.00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Finish carpentry items.
   B. Hardwood stain grade running trim, wall caps and base.
   C. Wood door frames, glazed frames.
   D. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS
   A. Section 06.10.00 - Rough Carpentry: Support framing, grounds, and concealed blocking.
   B. Section 08.14.16 - Flush Wood Doors.

1.03 REFERENCE STANDARDS
   A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
   D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS
   A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
   B. Product Data:
      1. Provide data on fire retardant treatment materials and application instructions.
      2. Provide instructions for attachment hardware and finish hardware.
   C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1.05 QUALITY ASSURANCE
   A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
      1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.
      2. Single Source Responsibility: Provide and install this work from single fabricator.
   B. Provide mockup of finish carpentry assembly indicated on the Drawings, including balcony railing caps at sidewall condition, stained and finished.

1.06 DELIVERY, STORAGE AND HANDLING
   A. Protect from moisture damage.
PART 2  PRODUCTS

2.01  FINISH CARPENTRY ITEMS

A.  Exterior Woodwork Items:
   1. Window Casings and Moldings: Softwood; prepare for paint finish.
   2. Soffits: Prepare for stain finish.

B.  Interior Woodwork Items:
   2. Exposed wood ceiling: prepare for paint finish.

2.02  WOOD BASED COMPONENTS

A.  Wood fabricated from old growth timber is not permitted.

B.  Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless indicated otherwise, and provided it is clean and free of contamination, identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc. (ALSC).

2.03  LUMBER MATERIALS

A.  Softwood Lumber: species as indicated, sawn as indicated, maximum moisture content of 6 percent with vertical grain, of quality suitable for transparent finish.

B.  Hardwood Lumber: species as indicated, sawn as indicated, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

2.04  SHEET MATERIALS

A.  Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

B.  Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

C.  Hardwood Plywood: Face species as indicated, plain sawn, book matched, medium density fiberboard core; HPVA HP-1, Grade AA, glue type as recommended for application.

D.  Particleboard: ANSI A208.1; Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

E.  Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).

F.  Pegboard: Pressed wood fiber with resin binder, standard grade; 1/8 inch thick, with holes spaced at 1 inch on center in both directions.

2.04  PLASTIC LAMINATE MATERIALS

A.  Plastic Laminate: NEMA LD 3, HGS; color as selected; textured, low gloss finish where indicated, such as at shelving that is not in Section 06.41.00 Architectural Wood Casework.

B.  Low Pressure Laminate: Melamine; selected color, and furniture surface texture.
2.05 FASTENINGS
   A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
   B. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES
   A. Lumber for Shimming and Blocking: Softwood lumber of Douglas Fir species.
   B. Wood Filler: Solvent base, tinted to match surface finish color.

2.07 WOOD TREATMENT
   A. Factory-Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.
   B. Wood Preservative by Pressure Treatment (PT Type): Provide AWPA U1 treatment using waterborne preservative with 0.25 percent retainage.
   C. Shop pressure treat wood materials requiring fire rating to concealed wood blocking.
   D. Provide identification on fire retardant treated material.
   E. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.
   F. Redry wood after pressure treatment to maximum 15 percent moisture content.

2.08 FABRICATION
   A. Shop assemble work for delivery to site, permitting passage through building openings.
   B. Cap exposed plastic laminate finish edges with material of same finish and pattern.
   C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
   D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

2.09 SHOP FINISHING
   A. Sand work smooth and set exposed nails and screws.
   B. Apply wood filler in exposed nail and screw indentations.
   C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
   D. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified and as follows:
      1. Transparent:
         a. System - 12, Polyurethane, Water-based.
         b. Stain: As selected by Architect.
         c. Sheen: Satin.
      2. Opaque:
         a. System - 12, Polyurethane, Water-based.
         b. Color: As selected by Architect.
c. Sheen: Satin.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify adequacy of backing and support framing.
   B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION
   A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
   B. Set and secure materials and components in place, plumb and level.
   C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 SITE APPLIED WOOD TREATMENT
   A. Apply preservative treatment in accordance with manufacturer's instructions.
   B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.
   C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING
   A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
   B. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.05 TOLERANCES
   A. Maximum Variation from True Position: 1/16 inch.
   B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06.20.00
SECTION 06.41.00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fabricated cabinet units.
   B. Cabinet hardware.
   C. Factory finishing.

1.02 RELATED REQUIREMENTS
   A. Section 06.10.00 - Rough Carpentry: Support framing, grounds, and concealed blocking.
   B. Section 12.36.00 - Countertops.

1.03 REFERENCE STANDARDS
   A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
   C. BHMA A156.9 - American National Standard for Cabinet Hardware; 2010.
   D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
   E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
   F. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
   G. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.04 SUBMITTALS
   A. See Section 00.72.00 - General Conditions, Paragraph 7, for submittal procedures.
   B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
      1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
      2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
      3. Include certification program label.
   C. Product Data: Provide data for hardware accessories.
   D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed countertop substrate and finish.
   E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.05 QUALITY ASSURANCE
   A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

1.06 DELIVERY, STORAGE AND HANDLING
   A. Protect units from moisture damage.

1.07 FIELD CONDITIONS
   A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS
   A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI (AWS) for Premium Grade.
   B. Wood Veneer Faced Cabinet:
   C. Plastic Laminate Faced Cabinets: Custom grade.
   D. Cabinets:
      1. Adjustable Shelf Loading: 50 lbs. per sq. ft.
      2. Cabinet Style: Flush overlay.
      4. Drawer Side Construction: Multiple-dovetailed.

2.02 WOOD BASED COMPONENTS
   A. Wood fabricated from old growth timber is not permitted.

2.03 LAMINATE MATERIALS
   A. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

2.04 ACCESSORIES
   A. Adhesive: Type recommended by fabricator to suit application.
   B. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
   C. Fasteners: Size and type to suit application.
   D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
   E. Grommets: Standard plastic, painted metal, or rubber grommets for cut-outs, in color to match adjacent surface.
2.06 HARDWARE

A. Hardware: BHMA A156.9, types as indicated for quality grade specified.
B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, satin chrome finish, for nominal 1 inch spacing adjustments.
D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
E. Drawer Slides:
   1. Type: Extension types as required.
   2. Static Load Capacity: Commercial grade.
   4. Stops: Integral type.
F. Hinges: European style concealed self-closing type, steel with satin finish.
G. Cash Drawers:
   2. Insert type, with mounting brackets for secure attachment to casework. 3. Width: 18.8"
   5. Drawer lock: manufacturer's standard.
   6. Finish:
      a. Prefinished painted.
      b. Color as selected from manufacturer's standard available options.
   7. Standard till with locking cover.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
C. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
   2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
D. Matching Wood Grain: Comply with requirements of quality standard for specified Grade exclusively.
E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

2.08 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.
B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Opaque:
      a. System - 12, Polyurethane, Water-based.
      b. Color: As selected by Architect.
      c. Sheen: Flat.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify adequacy of backing and support framing.
   B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION
   A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
   B. Use fixture attachments in concealed locations for wall mounted components.
   C. Use concealed joint fasteners to align and secure adjoining cabinet units.
   D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
   E. Secure cabinets to floor using appropriate angles and anchorages.
   F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING
   A. Adjust installed work.
   B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING
   A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 06.41.00
SECTION 07.21.00
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Board insulation and integral vapor retarder over roof sheathing.
B. Batt insulation in exterior wall and ceiling construction.
C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS
A. Section 05.40.00 - Cold-Formed Metal Framing: Board insulation as wall sheathing.
B. Section 06.10.00 - Rough Carpentry: Supporting construction for batt insulation.
C. Section 07.21.19 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.05 FIELD CONDITIONS
A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.
PART 2  PRODUCTS

2.01 FOAM BOARD INSULATION MATERIALS

A. Polyisocyanurate Board Insulation with Facers Both Sides, at exterior walls: Rigid cellular foam, complying with ASTM C1289; Type I, aluminum foil both faces; Class 2, glass fiber-reinforced core.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   4. Compressive Strength: 16 psi
   5. Board Size: 48 inch by 96 inch.
   6. Board Thickness: 1.5 inch.
   7. Thermal Resistance: R-value of 6.5 per inch.

2.02 BATT INSULATION MATERIALS

A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor’s option.
   1. Glass Fiber Batt Insulation: Unfaced flexible preformed batt or blanket, complying with ASTM C665; friction fit.
      1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
      2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
      3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
      5. Facing: Unfaced.

B. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced, flame spread index of 0 (zero) when tested in accordance with ASTM E84.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.

2.03 ACCESSORIES

A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide, at faced board insulation.

B. Insulation Fasteners: Lengths of unfinished, 13 gage, 0.072 inch high carbon spring steel with chisel or mitered tips, held in place by tension, length to suit insulation thickness and substrate, capable of securely supporting insulation in place.

C. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

D. Nails: Steel wire; galvanized; type and size to suit application.

E. Wire Mesh: Galvanized steel, hexagonal wire mesh.

F. Adhesive: Type recommended by insulation manufacturer for application.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
   B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT EXTERIOR WALLS
   A. Adhere a 6 inch wide strip of flashing sheet over expansion joints with double beads of adhesive each side of joint.
      1. Tape seal joints between sheets.
      2. Extend sheet full height of joint.
   B. Install rigid insulation directly to steel studs or exterior grade sheathing at 16 inches on center with manufacturer recommended mechanical fasteners, and tape joints with manufacturer's minimum 4 inch wide sealant tape; comply with ASTM E2357.
   C. Install boards horizontally on walls.
      1. Place boards to maximize adhesive contact.
      2. Install in running bond pattern.
      3. Butt edges and ends tightly to adjacent boards and to protrusions.
   D. Extend boards over expansion joints, unbonded to wall on one side of joint.
   E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
   F. Place 6 inch wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames, and tape seal in place to ensure continuity of vapor retarder and air seal.
   G. Tape insulation board joints.

3.03 BOARD INSTALLATION AT CAVITY WALLS
   A. Install boards to fit snugly between wall ties.
      1. Place membrane surface against adhesive.
      2. Place membrane surface facing out, and tape seal board joints.
   B. Install boards horizontally on walls.
      1. Place boards to maximize adhesive contact.
      2. Install in running bond pattern.
      3. Butt edges and ends tightly to adjacent boards and to protrusions.
      4. Place impale fastener locking discs.
   C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
   D. Place 6 inch wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames, and tape seal in place to ensure continuity of vapor retarder and air seal.

3.04 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK
   A. Installation of board insulation over low slope roof deck as specified in Section 07.53.23 EPDM Thermoset Single-Ply Roofing.
3.05 BATT INSTALLATION
   A. Install insulation in accordance with manufacturer's instructions.
   B. Install in exterior envelope spaces without gaps or voids. Do not compress insulation.
   C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
   D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.06 FIELD QUALITY CONTROL
   A. See Section 01.40.00 - Quality Requirements, for additional requirements.

3.07 PROTECTION
   A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07.21.00
SECTION 07.21.19
FOAMED IN PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Section Includes: Medium density, closed celled, polyurethane foam insulation.

1.02 RELATED SECTIONS
   A. Section 06.10.00 Rough Carpentry
   B. Section 07.21.00 Thermal Insulation

1.03 REFERENCES
   A. American Society for Testing and Materials International (ASTM)
   C. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials

1.04 SUBMITTALS
   A. Product Data for each type of insulation product specified.
   B. Product test reports performed by a qualified independent testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, water absorption, and other properties, based on comprehensive testing of current products.
   D. Manufacturer’s certificate certifying insulation provided meets or exceeds specified requirements.
   E. Installer’s certificate showing the manufacturer’s installation certification.
   F. Sample warranty

1.05 QUALITY ASSURANCE
   A. Manufacturer’s Qualifications: Product produced in an ISO 9001 registered factory.
   B. Single Source Responsibility: Single source product from one manufacturer.
   C. Installer Qualifications: Engage an Icynene Licensed Dealer (applicator) who has been trained and certified by Icynene.
   D. Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
1. Surface-Burning Characteristics: ASTM E 84

E. Toxicity/Hazardous Materials
   1. Provide products that contain no urea-formaldehyde
   2. Provide products that contain no PBDEs
   3. Provide products that are “Low-emitting”

1.06 DELIVERY, STORAGE AND HANDLING
   A. Comply with manufacturers written instructions for handling and protection prior to and during installation.
   B. Store both components in a temperature controlled area between 60 deg F and 85 deg F. Do not allow product to freeze.
   C. Use only those components that are supplied by the Manufacturer.

1.07 PROJECT CONDITIONS
   A. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

1.08 WARRANTY
   A. Manufacturer’s standard limited lifetime warranty.

PART 2 PRODUCTS

2.01 MANUFACTURER
   A. Polyurethane Spray Foam Insulation: Icynene ProSeal HFO Spray form Insulation by Icynene Inc.
   B. Substitutions: See Section 01.60.00 - Product Requirements.

2.02 MATERIALS
   A. General: Provide insulating materials that comply with requirements and with referenced standards.
   B. Icynene ProSeal HFO™ Spray Foam Insulation: Medium-density, closed-cell, conforming to the following material performance:
      1. Thermal Resistance (for 1 inch of material) (R-Value/inch @75 deg F): ASTM C 518; 6.2 hr.sq ft.degree F/BTU
      2. Thermal Resistance (for 3.5 inch of material) (R-Value/inch @75 deg F): ASTM C 518; 24 hr.sq ft.degree F/BTU
      3. Air Permeance (for 1 inch of material): ASTM E 2178; less than 0.02 L/s*m2 @75 Pa
      4. Water Vapor Transmission (for 1.4 inches of material): ASTM E 96; 0.95 perm
      5. Resistance to Fungal Growth: ASTM C 1338: no growth
      6. Flame Spread and Smoke Developed Rating: ASTM E 84
         a. Flame Spread: 15
         b. Smoke Development: 350
   C. Product Description:
      1. ICC Evaluation Service (ICC/ES) Report No. ESR-1826
      2. Light density, open celled, 100% water-blown polyurethane foam.
3. Collaborative for High-Performance Schools (CHPS) “Low-emitting material” per CA Section 01350 Criteria
4. Vapor permeable, insulation and air barrier material.

2.03 SOURCE QUALITY CONTROL
A. Product produced in an ISO 9001 registered factory.

PART 3 EXECUTION

3.01 EXAMINATION
A. Examine substrates and conditions, under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.
B. Review placement area to determine final location will not be within 3 inches of any heat source where the temperature will exceed 200 deg F per ASTM C 411 or in accordance with authorities having jurisdiction.

3.02 PREPARATION
A. Clean substrates and cavities of loose materials capable of interfering with insulation placement.

3.03 APPLICATION
A. Site mix components per manufacturer’s written instructions.
B. Apply insulation to substrates in compliance with manufacturer’s written instructions.
C. Apply insulation to produce thickness required for indicated R Value.
D. Extend insulation in thickness indicated to envelop entire area to be insulated.
E. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

3.04 REPAIRS
A. Any repairs must be effected by an installer approved or licensed by the manufacturer.

3.05 PROTECTION
A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse.

END OF SECTION 07.21.19
SECTION 07.25.00
WEATHER BARRIER

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Water-Resistive Barrier: Under exterior wall cladding, over sheathing or other substrate; not air tight or vapor retardant.
B. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls water vapor resistant and air tight.
C. Air Barriers: Materials that form a system to stop passage of air through exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls.

1.02 RELATED REQUIREMENTS
A. Section 06.10.00 - Rough Carpentry: Water-resistive barrier under exterior cladding.
B. Section 07.21.00 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
C. Section 07.92.00 - Joint Sealants: Sealing building expansion joints.
D. Section 09.21.16 - Gypsum Board Assemblies: Water-resistive barrier under exterior cladding.

1.03 DEFINITIONS
A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.
B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.
C. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.
D. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture resistant, to the degree specified, intended to be installed to shed water without sealed seams.

1.04 REFERENCE STANDARDS

1.05 SUBMITTALS
A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.

1.06 QUALITY ASSURANCE
A. Installer Qualifications: Company accredited and certified under the Air Barrier Association of America (ABAA) Quality Assurance Program (QAP).

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES
A. Water-Resistive Barrier: Provide on exterior walls under exterior cladding.
   1. Use building paper unless otherwise indicated.
   2. On under side of elevated floors, use self-adhering water-resistive air barrier membrane, refer to section 07 27 27.01

2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)
A. Air Barrier Sheet, Mechanically Fastened:
   1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 5 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (Desiccant Method) at 73.4 degrees F.
   3. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 180 days of weather exposure.
   4. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, when tested in accordance with ASTM E84.
   5. Seam and Perimeter Tape: Polyethylene self adhering type, mesh reinforced, 2 inches wide, compatible with sheet material; unless otherwise specified.

2.03 AIR BARRIER MATERIALS (AIR AND VAPOR BARRIER)
A. Air and Vapor Barrier Sheet, Self-Adhered:
   1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 0.02 perms, maximum, when tested in accordance with ASTM E96/E96M, Procedure B.
   3. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 30 days of weather exposure.
   4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
   5. Seam and Perimeter Tape: As recommended by sheet manufacturer.

2.04 ACCESSORIES
A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.

C. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION
A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.

3.03 INSTALLATION
A. Install materials in accordance with manufacturer's instructions.

B. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

D. Mechanically Fastened Sheets - On Exterior:
1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
2. Overlap seams as recommended by manufacturer but at least 6 inches.
3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
4. For applications specified to be air tight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
5. Install air barrier and vapor retarder underneath the jamb flashings.
6. Install head flashings under weather barrier.
7. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

E. Self-Adhered Sheets:
1. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
2. Lap sheets shingle-fashion to shed water and seal laps air tight.
3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
4. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
5. At wide joints, provide extra flexible membrane allowing joint movement.

F. Openings and Penetrations in Exterior Weather Barriers:
1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
3. At openings to be filled with non-flanged frames, seal weather barrier to each side of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.04 FIELD QUALITY CONTROL
A. See Section 01.40.00 - Quality Requirements, for additional requirements.
B. Coordination of ABAA Tests and Inspections:
   1. Provide testing and inspection required by ABAA QAP.
   2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
   3. Cooperate with ABAA testing agency.
   4. Allow access to air barrier work areas and staging.
   5. Do not cover air barrier work until tested, inspected, and accepted.
C. Do not cover installed weather barriers until required inspections have been completed.

3.05 PROTECTION
A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 07.25.00
SECTION 07.27.27.01
SELF-ADHERING WATER-RESSISTIVE AIR BARRIER MEMBRANE

PART 1 GENERAL

1.01 SYSTEM DESCRIPTION
A. Supply labor, materials and equipment for a fully adhered water-resistant vapor permeable air barrier membrane system.
B. Complete Work as shown on the Drawings and specified herein to bridge gaps and seal the water-resistant vapor permeable air barrier membrane against air leakage and water intrusion, including:
   1. Connections of the walls to the roof membrane
   2. Connections of the walls to the foundations
   3. Seismic and expansion joints
   4. Openings and penetrations of window and door frames, store front, curtain wall
   5. Piping, conduit, duct and similar penetrations
   6. Masonry ties, screws, bolts and similar penetrations
   7. All other air leakage pathways in the building envelope
C. Install primary water-resistant vapor permeable air barrier, flashing, and ventilation strip accessories.

1.02 REFERENCE STANDARDS
A. ASTM International (ASTM):
   1. ASTM D5034 - Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).

1.03 SUBMITTALS
A. Submit manufacturers’ current product data sheets, details and installation instructions for the water-resistant vapor permeable air barrier membrane components and accessories.
1.04 QUALITY ASSURANCE

A. Single Source: Self-adhered water-resistive vapor permeable air barrier membrane components and accessories must be obtained as a single-source membrane system to ensure total system compatibility and integrity.

B. Manufacturer Qualifications
   1. Manufacturer of specified products listed in this Section to have minimum 10 years of continued experience in the manufacture and supply of highly vapor permeable water resistive air barrier products successfully installed in similar project applications.
   2. Manufacturer of specified products listed in this Section to have experienced in-house technical and field observation personal qualified to provide expert technical support.

C. Fire Performance Characteristics: Provide water-resistive barrier meeting the following fire-test characteristics.
   1. Surface-Burning Characteristics: ASTM E84
   2. Flame spread index: 5 or less
   3. Smoke developed index: 15 or less

1.05 DELIVERY, STORAGE AND HANDLING

A. Refer to current Product Installation Instructions and SDS at www.vaproshield.com for proper storage and handling.

B. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

C. Store roll materials on end in original packaging. Protect rolls from direct sunlight and inclement weather until ready for use.

1.06 COORDINATION

A. Ensure continuity of the fully self-adhered water-resistive vapor permeable air barrier system throughout the scope of this section.
   1. Air barrier vapor permeable membrane to include self-adhered air barrier, transition membranes and sealants at penetrations.
   2. Drainage plane to include drainage cavity, water resistive barrier and flashings to the exterior.

1.07 ALTERNATES

A. Submit request for alternates in accordance with Section 00.72.00 – General Conditions, Paragraph 4.

B. Alternate submission to include:
   1. Evidence that alternate materials meet or exceed performance characteristics of specified Product requirements as well as documentation from an approved independent testing laboratory certifying the minimum physical dimensions, tensile strength, fire burning characteristics, vapor permeance and air leakage rates of the fully self-adhered water-resistive vapor permeable air barrier membrane. All testing to be performed without the aid of primers or surface conditioners.
   2. Manufacturer’s complete set of details for fully self-adhered water-resistive vapor permeable air barrier membrane system showing a continuous plane of water and air tightness throughout the building enclosure.
3. Manufacturer of alternate materials has experienced in-house technical and field observation personal qualified to provide expert technical support.

C. Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to bid date shall not be permitted for use on this project.

1.08 WARRANTY

A. Provide manufacturer’s standard material warranty in which manufacturer agrees to provide replacement material for the fully self-adhered water-resistive vapor permeable air barrier sheets installed in accordance with manufacturer’s instructions that fail due to material defects within 20 years of the date of Purchase.

PART 2 PRODUCTS

2.01 MATERIALS

A. Primary fully self-adhered water-resistive vapor permeable air barrier membrane components and accessories must be obtained from a single-source manufacturer to ensure total system compatibility and integrity.

1. Self-Adhered water-resistive vapor permeable air barrier membrane by VaproShield LLC., Gig Harbor, WA, Phone: (866) 731-7663, Website: www.vaproshield.com.

B. WATER-RESISTIVE VAPOR PERMEABLE SELF-ADHERED AIR BARRIER MATERIALS (Basis of Design)

1. Primary fully self-adhered air barrier sheet membrane shall be WrapShield SA® Self-Adhered Water-Resistive Vapor Permeable Air Barrier Sheet by VaproShield, a zero VOC fully self-adhered vapor permeable air barrier sheet membrane consisting of multiple layers of spun-bonded polypropylene tested in accordance with ICC-ES AC 38 criteria to meet IBC and IRC requirements for weather resistive barriers having the following properties:
   a. Color: Orange with allowable UV exposure for 180 days, prior to coverage.
   b. Breaking strength and Elongation to ASTM D5034: 88 lbf (391 N), machine direction; 83 lbf (369 N), cross-machine direction.
   c. Water Vapor Permeance tested to ASTM E96 Method B: minimum of 50.45 perms (2886 ng/Pa.s.m2)
   d. Water Vapor Permeance tested to ASTM E398: minimum of 52.57 perms (3007 ng/Pa.s.m2)
   e. Air Leakage: ≤0.00002 cfm/ft2 @ 1.57 psf (≤0.0001 L/s m2 @ 75 Pa) when tested in accordance with ASTM E2178 and <0.01 cfm/ft2 @ 1.57 psf (<0.01 L/s m2 @ 75 Pa) when tested in accordance with ASTM E2357 and. Meets Air Barrier Association of America (ABAA) requirements for “Adhesive Backed Commercial Building Wraps”.
   f. Water Resistance tested to AATCC 127, 550 mm hydrostatic head for 5 hours: No leakage
   g. Application Temperature: Ambient temperature must be above 20 °F (minus 6.7 °C)
   h. Surface Burning Characteristics tested to ASTM E84: Class A, Flame-spread index of less than 5, Smoke-developed index of less than 15
   i. Physical Dimensions: 0.022 inches (0.56 mm) thick and 59 inches (1.5 m) wide and 7.58 oz/yd2 (257 g/m2).

C. WATER-RESISTIVE VAPOR PERMEABLE TRANSITION AND FLASHING MEMBRANE Part One of Two part Flashing System
1. Self-adhered air barrier transition and flashing membrane for all window jambs, headers, door openings, inside and outside corners, and other transitions shall be pre-cut VaproFlashing SA™ by VaproShield, a zero VOC fully self-adhered water-resistive vapor permeable sheet membrane having the following properties:
   a. VaproFlashing SA™ Self-Adhered Orange: 6 ½ inches (17.8 cm), 11 3/4 inches (30 cm) or 19 2/3 inches (50 cm) wide x 164 feet (50 m) long
      i. Air Leakage: ≤0.00002 cfm/ft² @ 1.57 psf (≤0.0001 L/s m² @ 75 Pa) when tested in accordance with ASTM E 2178 and <0.01 cfm/ft² @ 1.57 psf (<0.01 L/s m² @ 75 Pa) when tested in accordance with ASTM E 2357
      ii. Water Vapor Permeance tested to ASTM E 96 Method B: minimum 50 perms (2861 ng/Pa.s.m²)
      iii. Water Vapor Permeance tested to ASTM E398: minimum of 50 perms (2861 ng/Pa.s.m²)
      iv. Water Resistance tested to AATCC 127, 550 mm hydrostatic head for 5 hours: No leakage

D. VAPROLIQUI-FLASH™ VAPOR PERMEABLE WATER RESISTIVE FLASHING FOR ROUGH OPENINGS
   Part II of Two Part Flashing System
   1. Window and door pre-cut VaproFlashing™ SA Self-Adhered shall include VaproLiqui-Flash™ by VaproShield, a liquid-applied vapor permeable air barrier flashing material with vapor permeance and resistance to air leakage properties compatible with the primary air barrier membrane.

E. THROUGH WALL FLASHING
   1. Thru-wall flashing shall include Vapro-SS Flashing™ by VaproShield, a flexible 2 mil (0.05 mm) stainless steel sheet with an 8 mil (0.20 mm) butyl adhesive backing and may include a VaproTermination Bar™ when the top section of the Vapro-SS Flashing™ is exposed.
      a. Vapro-SS Flashing™: 4, 6, 9, 12, 18 or 24 inches (10.2, 15.2, 22.9, 30.5, 45.7, 61 cm) x 50 feet (15.24 m) long.
      b. Tensile Strength/Puncture: 100,000 psi when tested in accordance with ASTM D882 and 2,500 psi when tested in accordance with ASTM E154
      c. VaproTermination Bar™: 1 inch (25 mm) wide x 8 feet (2.4 m) long, UV-resistance rigid thermoplastic extrusion, if required by sequence of installation.

F. TRANSITION FLASHING
   1. Transition flashing shall include VaproSilicone Transition™ by VaproShield, a flexible 80 mil (2 mm) extruded silicone sheet.
      a. VaproSilicone Transition™: 4, 6 or 9 inches (10.2, 15, 23 cm) x 50 feet (15.24 m) long.
      b. Dynamic Movement Capability: +200 / -50 % when tested in accordance to ASTM C1523.
      c. Elongation: 400 % when tested in accordance with ASTM D412.
      d. Tensile Strength: 295 psi (2.03 MPa) when tested in accordance with ASTM D412.
      e. Tear Strength: 20 ppi (3.5 N/mm) when tested in accordance to ASTM D624.

2.02 PENETRATION SEALANT
   A. Provide sealant for penetrations as recommended by manufacturer and as specified under Division 07 Section: Sealants. Appropriate sealants shall be VaproBond™ or VaproLiqui-Flash™.
PART 3  EXECUTION

3.01  GENERAL

A. Verify that surfaces and conditions are ready to accept the work of this section. Notify architect in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrates.

B. All surfaces must be dry, sound, clean, free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the water resistive air barrier membrane and flashings. Fill voids and gaps in substrate greater than 7/8 inch in width to provide an even surface. Strike masonry joints full-flush.

C. Minimum application temperature of fully self-adhered membrane and flashings to be above 20 °F (minus 6.0 °C).

D. Ensure all preparatory Work is complete prior to applying primary fully self-adhered vapor permeable air barrier sheet membrane.

E. Mechanical fasteners used to secure sheathing surfaces or penetrate sheathing surfaces shall be set flush with sheathing, fastened into solid backing and covered with the upper overlapping membrane. If exposed fasteners are present on the surface of the membrane, cover and seal with Vapro-LiquiFlash™ or VaproBond™.

F. If exposed fasteners are required, use VaproCaps™ to insure water/air tight seal.

3.02  COORDINATION OF SELF-ADHERED VAPOR PERMEABLE AIR BARRIER MEMBRANE INSTALLATION


B. Installation Summary:
   a. Self-adhered vapor permeable air barrier sheets may be installed vertically or horizontally over the outside face of exterior sheathing board or other approved substrates.
   b. Complete detail work at; wall openings, building transitions and penetrations prior to field applications
   c. Install fully self-adhered vapor permeable air barrier sheet over the outside face of exterior sheathing board or substrate, measure and pre-cut into manageable sized sheets to suit the application conditions.
   d. Install fully self-adhered vapor permeable air barrier sheet complete and continuous to substrate in a sequential minimal 3 inch (76 mm) overlapping weatherboard.
   e. Stagger all end lap seams.
   f. Roll installed membrane with roller to ensure positive contact and adhesion with substrate immediately.

3.03  BUILDING TRANSITION CONDITIONS

A. Consult published details at WWW.VaproShield.com.

B. Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials with self-adhering air barrier transition and flashing membrane.

C. Align and position fully self-adhered air barrier transition and flashing membrane, remove protective film and press firmly into place. Provide minimum 3 inch (76 mm) lap on to substrates.
D. Ensure minimum 3 inch (76 mm) overlap at side and end laps of membrane and 6 inch (152.4 mm) at inside and outside corners, if joints occur at corner locations.

E. Roll membrane and lap seams with roller to ensure positive contact and adhesion, immediately.

3.04 MECHANICAL EQUIPMENT PENETRATIONS

A. Mechanical pipe, electrical conduit and/or duct work must be secured solid into position prior to installation of fully self-adhered vapor permeable air barrier membrane.

B. Electrical services penetrating the wall assembly and fully self-adhered vapor permeable air barrier membrane must be placed in appropriate conduit and secured solid into position.

C. Install manufactured flanged penetration sleeves as recommended by sleeve manufacturer.

D. For straight sided penetrations, cut and fit fully self-adhered vapor permeable air barrier to accommodate sleeve, install VaproLiqui-Flash™ to seal the air barrier membrane to ductwork or preformed flange sleeve.

E. For pipe penetrations, refer to manufacturer’s standard details.

3.05 WINDOW, DOOR AND OTHER WALL OPENINGS

A. Consult published installation instructions at WWW.VaproShield.com.

B. Two part flashing system; VaproFlashing™ SA Self Adhered flashing and VaproLiqui-Flash™, Vapro-SS Flashing™ or VaproBond™ Flashing by VaproShield around window or wall openings subject to the opening size and installation of window, door or louver type.

C. VaproFlashing™ SA Self-Adhered air barrier transition and flashing membrane installed 2 ¾ inch (70 mm) into rough wall openings for the sill, jambs and head.

D. Remove release film, align flashing membrane and apply pressure to ensure positive contact. Roll Lap seams to ensure adhesion. Provide lap seams in singled fashion, to shed water.

E. VAPROLIQUI-FLASH VAPOR PERMEABLE WATER RESISTIVE FLASHING FOR ROUGH OPENINGS


2. Liquid-applied window and door flashing shall be VaproLiqui-Flash™ by VaproShield, a liquid-applied vapor permeable air barrier flashing material with resistance to moisture and air leakage properties compatible with the primary weather resistant air barrier membrane.

3. Apply a 12-15 wet mil (0.030-0.038 mm) coating onto the installed VaproFlashing™ SA Self-Adhered flashing, 1 inch (25.4 mm) onto the face continuing into the rough opening, covering the 2 ¾ inch (70 mm) VaproFlashing™ SA Self-Adhered flashing and the exposed rough opening surface.

F. THROUGH-WALL FLASHING MEMBRANE


2. Apply through-wall self-adhered flashing membrane along the base of masonry veneer walls and over shelf angles as detailed by designer.
   a. Press membrane firmly into place, overlap minimum 3 inches (76 mm) at all laps. Promptly roll all surfaces using a hand roller to ensure good adhesion.
   b. Applications shall form a continuous flashing membrane and shall extend up a minimum of 8 inches (20 cm) up the back-up wall.
c. Seal the top edge of the membrane where it meets the substrate using VaproBond™.
   Trowel-apply a feathered edge to seal termination to shed water or install VaproTermination™ Bar and VaproBond™ sealant at the top edge.

d. Install through-wall flashing membrane ½ inch (13 mm) from outside edge of veneer.
   Provide “end dam” flashing as detailed by designer.

3.06 VERTICAL APPLICATIONS SUMMARY


B. For vertical applications, align sheets with an ‘inside’ or ‘outside’ corner to avoid wrinkles and misalignment of subsequent applications.

C. Measure and pre-cut into manageable sized fully self-adhered sheets to suit the application conditions.

D. Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.

E. Roll up pre-cut material lengths with release paper facing OUTWARD.

F. Starting at a corner of the roll, peel back approx. 6” (152.4 mm) of release film from across the width of the pre-cut material roll.

G. Using hand pressure, lightly apply the exposed adhesive surface to the substrate.

H. Allow the rolled up material to drop down the wall, with the remainder of the release film still attached (facing the wall), and extend down to lowest point of wall, checking for proper alignment, repositioning as necessary.

I. Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.

J. Align and position fully self-adhered membrane, remove release film and press firmly into place. Provide minimum 3 inch (76 mm) overlap at side and end laps of membrane.

K. Remove release film and apply pressure to ensure positive contact onto wall substrate.

L. Install subsequent sheets of fully self-adhered vapor permeable air barrier sheets in overlapping weatherboard format. Ensure sheets lay smooth and flat to surfaces. Roll membrane and lap seams with two handed roller to ensure contact and adhesion.

M. Refer to http://vaproshield.com/installation/instructions for the most current and complete installation instructions.

3.02 HORIZONTAL APPLICATIONS

A. For horizontal applications, align sheets and begin installation of water-resistive weather barrier at bottom or lowest point of wall.

B. To avoid wrinkles and misalignment of subsequent applications, it is recommended to pre-mark or "Snap" a level line to work from.

C. Measure and pre-cut into manageable sized sheets to suit the application conditions.

D. Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.
E. Align and position fully self-adhered membrane, remove release film and press firmly into place. Provide minimum 3 inch (76 mm) overlap at all side and end laps of membrane. Roll membrane and lapped seams with a two handed roller to ensure contact and adhesion.

F. Remove release film and apply pressure to ensure positive contact onto wall substrate.

G. Install subsequent sheets of fully self-adhered vapor permeable air barrier sheets in overlapping weatherboard format. Ensure sheets lay smooth and flat to surfaces. Roll membrane and lapped seams with a two handed roller to ensure contact and adhesion.

H. Refer to http://vaproshield.com/installation/instructions for the most current and complete installation instructions.

### 3.03 BATTENS VENTILATION STRIPS, SHIMS OR MAT FOR RAIN SCREEN CLADDING SYSTEMS

A. Provide and install specified battens and ventilation strips under cladding systems.

B. Install horizontal starter strip or vent strip at base of wall, vertical battens and top vent strip, secure into solid backing ready for installation of cladding system.

C. Coordinate spacing of battens and vent strips to accommodate cladding system.

D. Coordinate spacing of VaproShim SA™ Self-Adhered to accommodate cladding system attachments.

E. Coordinate attachment of VaproMat™ to accommodate cladding system attachments.

### 3.04 FIELD QUALITY CONTROL

A. Make notification when sections of work are complete to allow review prior to covering fully self-adhered water-resistive vapor permeable air barrier system.

B. Owner to engage independent consultant to observe substrate and membrane installation prior to placement of cladding system(s) and provide written documentation of observations.

### 3.10 PROTECTION

A. Protect wall areas covered with self-adhered water-resistive vapor permeable air barrier from damage due to construction activities, high wind conditions, and extended exposure to inclement weather.

B. Review condition of fully self-adhered water-resistive vapor permeable air barrier prior to installation of cladding. Repair, or remove and replace damaged sections with new membrane.

C. Recommend to cap and protect exposed back-up walls against wet weather conditions during and after application of membrane, including wall openings and construction activity above completed fully self-adhered water-resistive vapor permeable air barrier installations.

D. Remove and replace water-resistive weather barrier membrane affected by chemical spills or surfactants.

**END OF SECTION 07.27.27.01**
SECTION 07.41.13
METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Metal panel roofing, including all components specified.

1.02 RELATED REQUIREMENTS
   A. Section 06.10.00 - Rough Carpentry:
      1. Perimeter wood members for attachment of edge trim.
      2. Wood nailers associated with roof insulation installed by others.
   B. Section 07.62.00 - Sheet Metal Flashing and Trim: Formed metal flashing and trim items
      associated with non-metal roofing.

1.03 REFERENCES
      Supplements and Errata.
   B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-
      Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
   D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal
      Insulation Board; 2014.
      2014.
      Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection;
      2013.
   G. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and
      Siding Systems by Uniform Static Air Pressure Difference; 2005 (Reapproved 2012).
   H. ASTM E1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel
      Systems by Uniform Static Air Pressure Difference; 1995 (Reapproved 2011).
   I. MBMA - Metal Roofing Systems Design Manual; Metal Building Manufacturers Association;
      2012.

1.04 SUBMITTALS
   A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Submit manufacturer's data sheets on each product to be installed and
      manufacturer's standard detail drawings applicable to this project.
      1. Installation Instructions: Provide manufacturer's instructions to installer, marked up to
         show exactly how all components will be installed; where instructions allow installation
         options, clearly indicate which option will be used.
C. Shop Drawings: Provide drawings prepared especially for this project for all relevant conditions, including plans and elevations, sections and details, specified loads, flashings, roof edges, terminations, expansion joints, curbs, penetrations, and drainage. Specifically include interfaces with materials not supplied by metal roof panel manufacturer and identify each component and its finish.

D. Specimen Warranty: Submit prior to starting work.

E. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.

F. Manufacturer's Installation Inspection Reports: Manufacturer may, at its option, inspect the installation at any time to appraise the installing contractor of their compliance with manufacturer's requirements. Typical inspections will include:
   1. Prior to the installation of the metal roofing panels to inspect the underlayments. The roofing contractor is responsible for assuring that the substrate is in suitable condition for the installation of the metal roofing components to the substrate.
   2. Intermediate inspections to ensure proper installation of the metal roofing panels (if required).
   3. At final completion of all metal roofing system work.
   4. Submit to Owner, for the project record, a copy of each report of inspection made.

G. Executed Warranty, by authorized company official.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Roofing installer shall have received training from metal panel manufacturer for installation of the specified roof panel system.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.

B. Exercise extreme care in unloading, storing, and installing metal panels to prevent bending, warping, twisting, and surface damage.

C. Store products above ground on well-supported platforms that provide minimum of 1:48 slope. Store under waterproof covering or indoors and provide proper ventilation of metal components to prevent condensation build-up between metal components.

1.07 WARRANTY

A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.

B. Manufacturer's warranty is in addition to, and not a limitation of, other rights the owner may have under the contract documents.

C. Warranty: Warranty covering roof panels and associated metal components, roof sheathing/insulation manufactured by panel manufacturer, and accessories, covering weathertightness, finish, materials, labor, and workmanship.
   1. Limit of Liability: No dollar limitation.
   2. Warranty Period: 20 years.
   3. Scope of Coverage: Repair leaks in the roofing system caused by:
      a. Ordinary wear and tear of the elements.
b. Manufacturing defect in materials.
c. Defective workmanship used to install these materials.
d. Damage due to winds up to 72 mph.

4. Not Covered:
   a. Damage due to winds in excess of 72 mph.
   b. Damage due hurricanes or tornadoes.
   c. Hail.
   d. Intentional damage.
   e. Unintentional damage due to normal rooftop inspections, maintenance, or service.

D. Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to
   repair finish or replace metal panels that show evidence of deterioration of factory-applied
   finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
      c. Cracking, chipping, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Basis of Design Product: 5V-Crimp/Double Rib panel by any of the following:
      1. Lyon Metal Roofing
      2. American Building Components
      3. McElroy Metal, Inc.
      4. Berridge Manufacturing Company
      5. ATAS International, Inc.
   B. Substitutions: See Section 01.60.00 - Product Requirements.

2.02 ROOFING SYSTEM DESCRIPTION
   A. Roofing System: Metal roof panels and other components, together forming a watertight
      assembly having the following characteristics:
      1. Panel Seam Type: 5V-Crimp.
      2. Panel Material: Steel, 24 gauge, with Kynar 500 (PVDF) pre-finish over Galvalume steel.
      3. Color: To be selected from manufacturer’s standard colors.
         a. Design Snow Load: Not less than 20 psf.
         b. Wind Pull-Off Resistance: No failure of roof panel or fasteners when tested in
            accordance with ASTM E1592 for negative loading equal to negative design wind load; for
            assemblies not tested, capacity for gauge, span, or loading may be determined by
            interpolating between test values only.
      5. Provide all necessary members and connections, whether indicated in the manufacturer's
         standard detail drawings or not.
      6. Accessories and Their Fasteners: Capable of resisting the specified design wind uplift forces
         and allowing for thermal movement of the roof panel system, not restricting free
movement of the roof panel system resulting from thermal forces except at designed points of roof panel fixity.

B. Roof System Components: In order from the top down:
   1. Metal Roofing Panels and Trim.
   2. Self Adhesive Membrane: As shown on documents.
   3. Roof Underlayment: 30# rolled felt.
   4. Sheathing: ½” plywood, tongue and groove or clipped, mechanically fastened to roof decking.
   5. Roof Insulation: Isocyanurate foam insulation board, R-25.
   6. Roof Deck: 3/4” plywood, tongue and groove or clipped

2.03 ROOF PANELS AND SHEET METAL FABRICATIONS

A. Roof Panels: 5V-Crimp profile, roll formed roofing panels produced in a permanent factory environment with fixed-base roll-forming equipment.
   1. Seam Height: 7/16 to 1/2” inches.
   3. Profile: 5V-Crimp.
   5. Form roofing panels in longest practical lengths, true to shape, accurate in size, square, and free from distribution or manufacturing defects.

B. Steel Sheet: 24 gauge, galvalume steel sheet, AZ50, conforming to ASTM A792.

C. Fluoropolymer Coating: 70 percent full strength Kynar 500/Hylar 5000.
   1. Exposed Surface: 1.0 mil plus/minus 0.1 mil total dry film thickness.
   2. Concealed Surface: 0.2 to 0.3 mils total dry film thickness.

D. Sheet Metal Components Associated with Metal Roof Panels: Made by same manufacturer and compatible with roof panels; of not less than minimum thickness required by roof panel manufacturer.
   1. Fabricate trim, flashing, and accessories to roofing manufacturer’s specified or approved profiles.
   2. Exposed metal components of same finish as panels.
   3. Provide the following formed sheet metal components:
      a. Eave.
      b. Gable ridge.
      c. Vertical fascia.
      d. Side wall flashing.
      e. Pipe and other penetration flashings, for penetrations over 8 inches.
      f. Other flashings.
      g. Gutters.
      h. Downspouts.

2.04 ROOF INSULATION AND SHEATHING

A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C1289 Type I, Class 1, with the following additional characteristics:
   1. Thickness: As indicated on drawings.
   2. Compressive Strength: 20 psi when tested in accordance with ASTM C1289.
3. UL-Classified and FM-approved for direct to steel deck applications.
4. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
5. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.

B. Sheathing: Plywood with the following characteristics:
1. Size: 48 inches by 96 inches, nominal.
2. Thickness: 1/2 inch.
3. Profile: Tongue and Groove (contractor may provide panel edge “H” clips in lieu of T&G)

C. Insulation/Sheathing Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

2.05 ACCESSORY MATERIALS

1. Resistance to Direct Exposure: At least 90 days.
3. Water Vapor Permeance: 0.1 perm, maximum.

B. Fasteners: In strict accordance with metal roof panel manufacturer's requirements; minimize exposed fasteners.
1. Fasteners Exposed to Weather: Sealed or with sealed washers on exterior side of covering to waterproof fastener penetration; washer material compatible with screw head; minimum 3/8 inch diameter washer for structural connections; gasket portion of fasteners or washers made of EPDM, neoprene, or other equally durable elastomeric material.
2. Fasteners Exposed to View: Head of color matching panel or component in which installed.

C. Molded Closure Strips: Non-absorptive closed-cell or solid-cell synthetic rubber or neoprene or polyvinylchloride, or metal pre-molded to match configuration of the covering; configuration to prevent retention of water.

PART 3 EXECUTION

3.01 GENERAL

A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.

B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.

C. Verify that shop drawings prepared by metal roof panel manufacturer have been approved and are available to installers; do not use drawings prepared by others for installation drawings.

D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

E. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.
F. Perform work using competent and properly equipped personnel.

G. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

H. Install roofing only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F.

I. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
   1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
   2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
   3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.

J. Until ready for use, keep materials in their original containers as labeled by the manufacturer.

K. Consult membrane manufacturer’s instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.02 EXAMINATION
A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.

B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.

C. Verify that the substructure installation is in accordance with the approved shop drawings and roof panel manufacturer’s requirements, that the fasteners are correct for the substrate, and the substrate is installed to accommodate and support the appropriate clip spacing and attachment.

D. Verify that installed work of other trades that such work is complete to a point where the roofing system installation may commence.

E. Verify that roof openings, curbs, pipes, sleeves, ducts, vents, and other penetrations through roof substrate are complete and properly located.

F. In event of discrepancy, notify Architect in writing; do not proceed with installation until discrepancies have been resolved.

3.02 PREPARATION
A. Remove existing roof system down to the roof deck including insulation and flashings. Dispose of all materials properly.
   1. At penetrations, remove all existing flashings, including lead, asphalt, mastic, etc.
2. At walls, curbs, and other vertical and sloped surfaces, remove loose and unsecured flashings; remove mineral surfaced and coated flashings; remove excessive asphalt to provide a smooth, sound surface for new flashings.

B. Replace deteriorated deck components.

3.03 INSULATION INSTALLATION
   A. Install insulation over entire area to be roofed, mechanically fastened as required by roofing manufacturer.
   
   B. Provide wood nailers at all perimeters of insulation and at other locations where indicated on the drawings, of total height matching the total thickness of insulation being used.
      1. Install with 1/8 inch gap between each length and at each change of direction.
      2. Mechanically fasten to deck to resist force of 200 lbf per linear foot.

3.04 SHEATHING/Cover BOARD INSTALLATION
   A. Install sheathing/cover board over entire area to be roofed, mechanically fastened as required by roofing manufacturer.

3.05 SELF ADHESIVE MEMBRANE/UNDERLAYMENT INSTALLATION
   A. Install self adhesive membrane and underlayment in accordance with manufacturer's instructions.
   B. Install underlayment over entire roofing surface.

3.06 ROOF PANEL INSTALLATION
   A. Install the metal roof panel system in accordance with the manufacturer’s instructions, installation drawings, and approved shop drawings, so that it is weathertight and allows for thermal movement.
   B. Locate and space all fasteners in accordance with roof panel manufacturer’s recommendations. For required exposed fasteners, use proper torque settings to obtain controlled uniform compression for a positive seal without rupturing the sealing washers.
   C. Do not place utility penetrations through the panel seams.
   D. Do not allow panels or trim to come into contact with dissimilar materials (i.e. copper, lead, graphite, treated lumber, mortar, etc). Protect from water run-off from these materials.
   E. Perform field cutting of panels and related sheet metal components by means of hand or electric shears. At no time shall a hot/friction saw be used.
   F. Remove protective film immediately after installation.

3.07 FLASHING AND ACCESSORIES INSTALLATION
   A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by roof panel manufacturer's recommendations and details.
   B. Install metal trim, accessories, and edgings in locations indicated on the drawings.
      1. Follow roofing manufacturer's instructions.
      2. Remove protective plastic surface film immediately before installation.
C. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, curbs, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches high above membrane surface. 
   1. Use the longest practical flashing pieces.

D. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
   1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical.

Where pre-molded pipe flashings are not practical, provide flashing detail as recommended by metal panel manufacturer.

3.08 FIELD QUALITY CONTROL
   A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).
   B. Perform all corrections necessary for issuance of warranty.

3.09 ADJUSTING AND CLEANING
   A. Repair panels having minor damage.
   B. Remove panels damaged beyond repair and replace with new panels to match adjacent undamaged panels.
   C. Clean exposed panel surfaces promptly after installation in accordance with recommendations of panel and coating manufacturers.
   D. Clean all contaminants generated by roofing work from building and surrounding areas, including adhesives, sealants, and coatings.
   E. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
   F. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

3.10 PROTECTION
   A. Where construction traffic must continue over finished roof panels, provide durable protection and replace or repair damaged roofing to original condition.

END OF SECTION 07.41.13
SECTION 07.44.56
FIBER CEMENT PANEL ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Related work specified elsewhere includes:
   1. Rough carpentry.
   2. Sheathing
   3. 5/16" Fiber Cement Panel systems
   4. Painting.

1.02 SUBMITTALS
A. Product data: Indicate product description, including compliance with specified requirements and installation requirements. Mark manufacturer’s brochures to include only those products proposed for use

1.03 QUALITY ASSURANCE
A. Applicable standards; standards of the following, as referenced herein:
   1. Aluminum Association (AA).
B. Allowable tolerances in horizontal planes:
   1. Variation from level: +1/8" in 12'-0".
C. Allowable tolerances in framed vertical construction.
   1. Position: +1/4" maximum variation from design position.
   2. Alignment: 1/8" in 8'-0"; 1/4" maximum in any continuous wall, line or surface.

1.04 DELIVERY, STORAGE AND HANDLING
A. Storage:
   1. Stack accessories off floor on pallets or similar platforms providing continuous support for accessories to prevent sagging. Stack accessories so that long lengths are not over short lengths.
   2. Handle materials to prevent damage to surfaces, edges and ends of aluminum trims. Reject and remove damaged material from site.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Acceptable manufacturer; subject to compliance with specified requirements:
   1. Fry Reglet Corporation.
      1377 Stonefield Court.
      Alpharetta, GA 30004
      Phone 800-237-9773  Fax 800-200-4379
B. Substitutions: See Section 01.60.00 - Product Requirements.
2.02 MATERIALS AND FINISH

A. Anodized finish:
   2. Thickness of anodic coating shall be tested in accord with ASTM B244-97 and sealed to pass modified dye stain test ASTM B136-84(1998).

2.03 PROFILES

A. Vertical Reveal Insert
   1. Acceptable product: Number FCP –T-PIECE
   2. Characteristics:
      a. Fry Reglet FCP T Piece creates a 1/16” shadow line between fiber cement panels, providing a vertical design element.
      c. Dimensions: As indicated on drawings

B. Base Trim:
   1. Acceptable product: FCP – BASE
   2. Characteristics:
      a. Description: Base trim provides an exposed, flush termination at the bottom horizontal edges of 5/16” fiber cement panels.
      c. Dimensions: As indicated on drawings

PART 3 EXECUTION

3.01 INSTALLATION

A. 5/16” Fiber Cement Panels: Install panel accessories in accordance with panel manufacturer’s supplemental installation details for commercial applications and as follows:
   1. F-Mold: Install as a termination trim as indicated on drawings.
   2. J Channel: Install at exposed edge of 5/16” fiber cement panels at sides of door and window openings, and at intersections with other materials.
   3. Vertical H Molding: Install as a divider between 5/16” fiber cement panels as shown on drawings.
   4. Vertical molding: Install between 5/16” fiber cement panels as indicated on drawings.
   5. Vertical retainer: Install between 5/16” fiber cement panels as receiver for Vertical Insert or Vertical Offset as indicated on drawings.
   6. Vertical Insert: Install between single layers of 5/16” fiber cement panels as indicated on drawings. Must be used with Vertical Retainer.
   7. Vertical Offset: Install as a transition between a single layer and lap siding of 5/16” fiber cement panels. Must be used with Vertical Retainer.
   8. Vertical Lap Insert: Install as a ¾” deep reveal as indicated on drawings.
   9. Base Trim: Install base trim at bottoms of FCP panels as indicated on drawings.
   10. Horizontal Trim: Install at horizontal joints between 5/16” fiber cement panels as indicated on drawings.
   11. Horizontal Notch: Install horizontal notch trims at intersections with vertical trims as indicated on drawings.
   12. Double horizontal: Install double horizontal trim between tops and bottoms of 5/16” FCP panels as indicated on drawings.
13. Drip cap: Install drip cap at tops of doors and windows as indicated on drawings.
14. Inside and outside corner trims, bullnose corner trims, integral corner trims and corner transitions: Install at designated corners as shown on drawings.
15. J Channel Lap Trim: Install at sills, jambs and soffits as indicated on drawings.
16. F Channel Lap Trim: Install at intersections, sills, jambs and soffits as shown on drawings.

3.02 PROTECTION

A. Protect accessories from damage until date of Substantial Completion. Replace accessories which become damaged.

END OF SECTION 07.44.56
SECTION 07.46.23
WOOD SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Board siding for Walls and Soffits.

1.02 RELATED REQUIREMENTS
   A. Section 07.25.00 - Weather Barriers: Weather barrier under siding.
   B. Section 07.62.00 - Sheet Metal Flashing and Trim: Product requirements for metal flashings and trim associated with wood siding for placement by this section.
   C. Section 07.92.00 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures.
   D. Section 09.21.16 - Gypsum Board Assemblies: Siding substrate.

1.03 REFERENCE STANDARDS
   D. SPIB (GR) - Grading Rules; 2014.

1.04 SUBMITTALS
   A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
   B. Product Data: Provide data indicating materials, component profiles, fastening methods, jointing details, sizes, surface texture, finishes, and accessories.
   C. Samples: Submit two samples 12 x 12 inch in size illustrating surface texture and finish.

1.05 DELIVERY, STORAGE AND HANDLING
   A. Store in ventilated areas with constant minimum temperature of 60 degrees F and maximum relative humidity of 55 percent.

PART 2 PRODUCTS

2.01 SIDING
   A. Board Siding: Tongue and groove, Douglas Fir, CV grade, maximum moisture content of 10 percent.
      1. Size: 2 inch thick, 6 inch high nominal board with .5 inch lap.
      2. Profile: Tongue and groove.
      4. Preservative Treatment: Pressure treatment in accordance with AWPA U1, using water borne preservative.
2.02 ACCESSORIES
   A. Preservative Treatment: Dip- or brush-type, non-discoloring.
   B. Nails: Corrosion resistant type; non-staining, of size and strength to securely and rigidly retain the work; prefinished to match siding finish.
   C. Flashing: Aluminum as specified in Section 07.62.00.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that substrates are ready to receive work.
   B. Verify that weather barrier has been installed over substrate completely and correctly.
   C. Do not begin until unacceptable conditions have been corrected.
   D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION
   A. Apply preservative treatment in accordance with manufacturer's instructions.
      1. Verify materials do not exceed the specified percent moisture content before applying wood preservative treatment.
      2. Brush apply one coat of preservative treatment.
   B. Apply dip- or brush-type preservative to site-sawn ends of pressure preservative treated materials. Allow preservative to cure prior to erecting materials.
   C. Do not install materials until site pre-finishing is complete and dry.

3.03 INSTALLATION
   A. Fasten siding in place, level and plumb.
      1. Arrange for orderly nailing pattern. Blind nail except on over trim.
      2. Install siding for natural shed of water.
   B. Install board siding using single course method,
      1. Nail at 12 inches on center.
      2. Miter horizontal joints tight at 45 degrees. Miter external and miter internal corners.
   C. Install metal flashings at internal and external corners.
   D. Sand work smooth and set exposed nails and screws.

3.04 TOLERANCES
   A. Maximum Variation From Plumb and Level: 1/4 inch per 10 feet.
   B. Maximum Offset From Joint Alignment: 1/16 inch.

END OF SECTION 07.46.23
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fiber cement lap siding, panels, shingle, trim, fascia, moulding and accessories; James Hardie HZ5 Engineered for Climate Siding.
   B. Factory-finished fiber cement lap siding, panels, shingle, trim, fascia, moulding and accessories; James Hardie HZ5 Engineered for Climate Siding.

1.02 REFERENCES
   A. ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets
   C. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.03 SUBMITTALS
   A. Submit under provisions of Section 01 33 00.
   B. Product Data: Manufacturer's data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Installation methods.
   C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.
   D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
   E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.04 QUALITY ASSURANCE
   A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

1.05 DELIVERY, STORAGE AND HANDLING
   A. Store products in manufacturer's unopened packaging until ready for installation.
   B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
   C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
1.06 PROJECT CONDITIONS
   A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits
      recommended by manufacturer for optimum results. Do not install products under
      environmental conditions outside manufacturer's absolute limits.

1.07 WARRANTY
   A. Product Warranty: Limited, non-pro-rated product warranty.
      1. HardiePlank HZ5 lap siding for 30 years.
      2. HardieSoffit HZ5 panels for 30 years.
   B. Product Warranty: Limited, product warranty.
      1. HardieTrim HZ and HZ5 boards for 15 years.
   C. Finish Warranty: Limited product warranty against manufacturing finish defects.
      1. When used for its intended purpose, properly installed and maintained according to James
         Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus
         Technology, for a period of 15 years from the date of purchase: will not peel; will not crack;
         and will not chip. Finish warranty includes the coverage for labor and material.
   D. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La
      Alameda Suite 400; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980;
      Fax: 949-367-4981; Email: request info (info@jameshardie.com); Web: www.jameshardiecommercial.com
   B. Requests for approval of equal substitutions will be considered in accordance with provisions
      of Section 00 43 00.

2.02 SIDING
   A. HardiePlank HZ5 lap siding and HardieSoffit HZ5 panels requirement for Materials:
      1. Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.
      2. Fiber-cement Siding - complies with ASTM E 136 as a noncombustible material.
      3. Fiber-cement Siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed
         Index = 5.
      4. CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface
         (WUI) Listed Product.
   B. Artisan HZ5 lap siding requirement for Materials:
      1. Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.
      2. Fiber-cement Siding - complies with ASTM E 136 as a noncombustible material.
      3. Fiber-cement Siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed
         Index = 5.
      5. CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface
         (WUI) Listed Product.
C. Lap Siding: HardiePlank HZ5 Lap siding with a sloped top, beveled drip edge and nailing line as manufactured by James Hardie Building Products, Inc.
   1. Type: Smooth 7-1/4 inches (184 mm) with 6 inches (152 mm) exposure.

D. Trim:
   1. HardieTrim HZ5 boards and HardieTrim HZ boards as manufactured by James Hardie Building Products, Inc.
   2. HardieTrim HZ5 Fascia boards as manufactured by James Hardie Building Products, Inc.
   3. HardieTrim HZ5 Crown moulding manufactured by James Hardie Building Products, Inc.
   4. Artisan HZ5 Accent trim as manufactured by James Hardie Building Products, Inc.

2.03 FASTENERS
A. Wood Framing: 0.091 inch (2.3 mm) shank by 0.225 inch (5.7 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.

2.04 FINISHES
A. Factory Primer: Provide factory applied universal primer.
   2. Topcoat: Refer to Exterior Finish Schedule.

PART 3 EXECUTION

3.01 EXAMINATION
A. Do not begin installation until substrates have been properly prepared.
B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
C. Nominal 2 inch by 4 inch (51 m by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.
D. Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.

3.02 PREPARATION
A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Install a water-resistive barrier is required in accordance with local building code requirements.

D. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

E. Install Engineered for ClimateTM HardieWrapTM weather barrier in accordance with local building code requirements.

F. Use HardieWrapTM Seam Tape and joint and laps.

G. Install HardieWrapTM flashing, and HardieWrapTM Flex Flashing

3.03 INSTALLATION - HARDIEPLANK HZ5 LAP SIDING AND ARTISAN HZ5 LAP SIDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer’s installation instructions.

D. Align vertical joints of the planks over framing members.

E. Maintain clearance between siding and adjacent finished grade.

F. Locate splices at least one stud cavity away from window and door openings.

G. Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

H. Locate splices at least 12 inches (305 mm) away from window and door openings.

3.04 INSTALLATION - HARDIETRIM HZ5 BOARDS

A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.

B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

C. Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.

D. Maintain clearance between trim and adjacent finished grade.

E. Trim inside corner with a single board trim both side of corner.

F. Outside Corner Board Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail 1/2 inch (13 mm) from edge spaced 16 inches (406 mm) apart, weather cut each end spaced minimum 12 inches (305 mm) apart.

G. Allow 1/8 inch gap between trim and siding.

H. Seal gap with high quality, paint-able caulk.
I. Shim frieze board as required to align with corner trim.
J. Fasten through overlapping boards. Do not nail between lap joints.
K. Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten HardieTrim boards to HardieTrim boards.
L. Shim frieze board as required to align with corner trim.
M. Install HardieTrim Fascia boards to rafter tails or to sub fascia.

3.05 FINISHING

A. Finish factory primed siding with a minimum of two coats of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.06 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 32.92.19
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fabricated sheet metal items, including fascias, flashings, counterflashings, and other indicated items.
B. Sealants for joints within sheet metal fabrications.
C. Reglets and accessories.

1.02 RELATED REQUIREMENTS
A. Section 06.10.00 - Rough Carpentry: Wood nailers for sheet metal work.
B. Section 07.92.00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.03 REFERENCE STANDARDS
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.04 SUBMITTALS
A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on materials, finishes, anchor types and locations.
C. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
D. Installation Instructions: Indicate special procedures, fasteners, supporting members and perimeter conditions requiring special attention.
E. Warranty: Materials and Installation shall be included in the Total Roofing System Warranty provided on the form of Section 07.50.36, per instructions in Section 07.50.35.
1.05 QUALITY ASSURANCE
   A. Perform work in accordance with manufacturer requirements and standard details, except as otherwise indicated.
   B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with ten years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
   B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS
   A. Metallic-Coated Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Where flashing abuts roofing system. Match roof color. ASTM A653/A653M
   B. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 16 gage, .050" inch thick, unless otherwise indicated; plain texture, shop pre-coated with fluoropolymer coating. Where flashing abuts aluminum-clad window system.
      1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system. Finish color as designated on plans
      2. Color: As selected by Architect Color to match adjacent fiber cement assembly, see plans.

2.02 COMPONENTS
   A. Roof Edge Flashings: Fabricated to sizes required; mitered, concealed fasteners.

2.03 FABRICATION
   A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
   B. Fabricate cleats of same material as sheet, minimum 3 inches high, interlocking with sheet.
   C. Form pieces in longest possible lengths.
   D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
   E. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
   F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
   B. Verify roofing termination and base flashings are in place, sealed, and secure.
3.02 PREPARATION
A. Install starter and edge strips, and cleats before starting installation.
B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION
A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
B. Apply plastic cement compound between metal flashings and felt flashings.
C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
D. Seal metal joints watertight.

3.04 FIELD QUALITY CONTROL
A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION 07.62.00
SECTION 07.62.13
SHEET METAL GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Gutters and downspouts
   B. Accessories

1.02 REFERENCES
   A. American Society for Testing and Materials (ASTM):
      1. ASTM A653: Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron
         Alloy Coated (Galvannealed by the Hot Dip Process.
      2. ASTM A792: Standard Specification for Steel Sheet, 55 percent Aluminum Zinc Alloy Coated
         by the Hot Dip Process.
      3. ASTM A924: Standard Specification for General Requirements for Steel Sheet, Metallic
         Coated by the Hot Dip Process.

1.03 SUBMITTALS
   A. Refer to Section 01 33 00 Submittal Procedures
   B. Product Data: Submit manufacturer current technical literature for each type of product.
   C. Samples: Provide nominal 3 x 5 inch sample of each color indicated for gutters, downspouts
      and accessories.

1.04 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Manufacturer shall have a minimum of five (5) years experience
      in the production of sheet metal gutters and downspouts.
   B. Fabricator Qualifications: Shall be approved by manufacturer for fabrication of gutters and
      downspouts.

1.05 DELIVERY, STORAGE AND HANDLING
   A. Refer to Section 01 Product Requirements

1.06 WARRANTY
   A. Finish Warranty:
      1. Manufacturing Defects: Standard form in which manufacturer agrees to repair or replace
         items that fail by blistering, checks, crazes, flakes, peels or weathers unevenly due to a defect
         in manufacturing within warranty period from date of original installation.
      2. Warranty Period: 20 years.

PART 2 PRODUCTS

2.01 MANUFACTURER
   A. To be supplied by metal roof panel manufacturer.
2.02 GUTTERS
A. Materials:
   1. Steel Coil Stock: Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792, Class AZ50 coating designation
B. Half-Round Gutter Fabrication:
   2. Length: 10 feet.
   3. Steel Thickness: 22 gauge

2.03 DOWNSPOUTS
A. Round downspout fabrication:
   1. Size: 4 inch diameter.
   2. Length: 10 feet.
   3. Texture: Smooth.
   4. Steel Thickness: 22 gauge

2.04 ACCESSORIES
A. Gutters:
   1. End Caps: Match material, shape and finish of gutter.
   2. Outlet Tubes: Match material and shape of downspout.
   3. Gutter Support:
      a. 6” #10 combo shank and circle gutter hanger
B. Downspouts:
   1. Downspout Support:
      a. Threaded rod round downspout bracket.
      b. Color: As selected from manufacturer’s full color line
   2. Miscellaneous downspout components: Provide all necessary elbows, downspout offset sections, and pop rivets as required for a complete installation. All miscellaneous components shall match downspouts.
C. Fasteners:
   1. Steel fasteners of sufficient length to penetrate minimum 1 inch into substrate.
D. Flashing: Provide flashing complying with Section 07 62 00 Sheet Metal Flashing and Trim at roof apron, fascia apron, and where indicated.
E. Sealants: Triopolymer, single component sealant as recommended by manufacturer at gutter joints.

2.05 FINISH
A. Exterior Coating: Standard Coating; Kynar 500
   1. Color: As selected from manufacturer’s standard color line.
B. Interior coating: Manufacturer’s standard primer wash coat.

PART 3 EXECUTION
3.01 PREPARATION
A. Verify that substrates are in place and ready for installation of gutters and downspouts.
3.02 INSTALLATION

A. General: Install Work securely in place and provide for expansion and contraction of components using lapped and sealed joints.
   1. Do not install damaged components.
   2. Separate dissimilar metals to prevent galvanic action through the use of bituminous coating or other permanent separation recommended by SMACNA.
   3. Space expansion joints in gutters as recommended by manufacturer.
   4. Rivet joints where required for strength, exposed rivet shall match gutter or downspout color.
   5. Torch cutting of components is not allowed.

B. Gutters:
   1. Install gutter supports at no more than 24 inches on center, align hangers w/ roof joists
   2. Slope gutters evenly to downspouts; provide end caps at gutter ends and seal watertight per manufacturer’s instructions.
   3. Install outlet tubes at all downspout locations, seal watertight.
   4. Apply joint sealants at gutter joints per manufacturer’s installation instructions and to meet the requirements of Section 07 92 00 – Joint Sealants

C. Downspouts:
   1. Install downspouts, provide elbows and offsets, and secure downspouts to wall construction using downspout supports spaced no more than 10 feet on center. Maximum distance of downspout support from top or bottom of downspout shall be 2 feet. Provide 45 degree elbow at bottom of downspout to direct water away from wall surface or foundation.
   2. Where downspout connects to building perimeter drainage system, lap downspout and perimeter drainage pipe a minimum of 3 inches.
   3. Install formed metal splash pans under downspouts.

3.03 CLEANING AND PROTECTION

A. Remove damaged, defective or improperly installed materials. Replace with new materials installed per requirements of this section.

B. Clean finished surfaces according to manufacturer’s written instructions; maintain clean condition until Final Completion.

END OF SECTION 07.62.13
SECTION 07.72.53
ROOF ACCESSORIES

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Snow guards for installation on sloped roofing-for metal roofs and metal panels.
B. Spacing and method of attachment.

1.02  RELATED SECTIONS
A. Section 07.41.13 – Metal Roof Panels

1.03  SUBMITTALS
A. Refer to Section 00.72.00 – General Conditions, Paragraph 7 for submittal procedures.
B. Provide layout(s) showing snow guard spacing and location, roof dimensions and ground snow load.
C. Provide cut sheets with descriptions of product(s) and installation instructions.

1.04  QUALITY ASSURANCE
A. Provide Architectural Testing product load data test results for snow guards.
B. Installer shall have at least 5 years experience installing the specified roofing material and snow guards.

1.05  WARRANTY
A. Lifetime Warranty
   1. Provide warranty information from manufacturer covering against material and/or workmanship defect(s).

PART 2  PRODUCTS

2.01  MANUFACTURERS
A. IceBlox, Inc., d.b.a. Snoblox-Snojax 1405 Brandton Road Mechanicsburg, PA 17055, Phone: (800) 766-5291 or (717) 737-4398, Fax: (800) 634-7906 or (717) 697-6141, Online: www.snoblox.com support@snojax.com
B. Sno Shield Inc; 3968 E Sunnyside Rd, Bldg 3, Ammon, ID. 83406; Toll Free Tel: 888-976-6744; Tel: 208- 524-7371; Fax: 208-524-1041; Email: info@snoshield.com; Web:www.snoshield.com
C. Substitutions: See Section 00.72.00 – General Conditions, Paragraph 4.

2.02  MATERIALS
A. Injection molded virgin grade polycarbonate plastic treated with UV stabilizers.

2.03  FINISH/COLOR
A. Selected from manufacturer’s standard colors to match the roof panel.
PART 3 EXECUTION

3.01 PREPARATION

A. Prior to installation, inspect conditions to verify that surfaces are suitable for installation of snow guards and clean all surfaces to achieve best result.

3.02 INSTALLATION

A. Install system in accordance with manufacturer’s installation instructions and approved architectural drawings.

3.03 WARRANTY

A. Provide manufacturer’s standard warranty for material defects.

END OF SECTION 07.72.53
PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Nonsag gunnable joint sealants.
   B. Self-leveling pourable joint sealants.
   C. Joint backings and accessories.

1.02  RELATED REQUIREMENTS
   A. Section 07.25.00 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
   B. Section 09.21.16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
   C. Section 09.22.16 - Non-Structural Metal Framing: Sealing between framing and adjacent construction in acoustical and sound-rated walls and ceilings.

1.03  REFERENCE STANDARDS
   L. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.04  SUBMITTALS
   A. See Section 01.30.00 - Administrative Requirements, for submittal procedures.
   B. Product Data for Sealants: Submit manufacturer’s technical data sheets for each product to be used, that includes the following.
1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
2. List of backing materials approved for use with the specific product.
3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
4. Substrates the product should not be used on.
5. Substrates for which use of primer is required.
6. Substrates for which laboratory adhesion and/or compatibility testing is required.
7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
8. Sample product warranty.
9. Certification by manufacturer indicating that product complies with specification requirements.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Submit manufacturer's color cards showing standard colors available for selection. The intent is to match the exterior color(s) of sealants on the Millennium Center; custom exterior colors may be required.

E. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   3. Stain Testing: In accordance with ASTM C1248; required only for stone substrates.
   4. Allow sufficient time for testing to avoid delaying the work.
   5. Deliver to manufacturer sufficient samples for testing.
   6. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
   7. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

D. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

1.06 WARRANTY

A. See Section 01.78.21 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
   a. Wall expansion and control joints.
   b. Joints between door, window, and other frames and adjacent construction.
   c. Joints between different exposed materials.
   d. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames and adjacent construction.
   b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
   c. Other joints indicated below.
3. Do not seal the following types of joints.
   a. Intentional weepholes in masonry.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   d. Joints where installation of sealant is specified in another section.
   e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use nonsag non-staining silicone sealant, unless otherwise indicated.
1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
2. Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing.
3. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
3. Wall, Ceiling, and Floor Joints Where Tamper-Resistance is Required: Nonsag tamper-resistant polyurethane sealant.
4. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
5. In Sound-Rated Assemblies: Acrylic emulsion latex sealant.

D. Interior Wet Areas: Bathrooms and restrooms; fixtures in wet areas include plumbing fixtures, countertops, cabinets, and other similar items.

E. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", "noise critical", or "acoustical".
2.02 JOINT SEALANTS - GENERAL
   A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.03 NONSAG JOINT SEALANTS
   A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
      1. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
      2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
      3. Color: To be selected by Architect from manufacturer's standard range.
      4. Cure Type: Single-component, neutral moisture curing
      5. Service Temperature Range: Minus 65 to 180 degrees F.
   C. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   D. Silyl-Terminated Polyether (STPE) and Polyurethane (STPU) Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
      1. Movement Capability: Plus and minus 35 percent, minimum.
      2. Hardness Range: 20 to 40, Shore A, when tested in accordance with ASTM C661.
      3. Color: To be selected by Architect from manufacturer's standard range.
      4. Service Temperature Range: Minus 40 to 180 degrees F.
   E. Tamper-Resistant, Silyl-Terminated Polyurethane (STPU) Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
      1. Movement Capability: Plus and minus 25 percent, minimum
      2. Hardness Range: 25 to 30, Shore A, when tested in accordance with ASTM C661.
   F. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multicomponent; not expected to withstand continuous water immersion or traffic.
   G. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
      1. Movement Capability: Plus and minus 35 percent, minimum.
   H. Non-Sag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
      2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.
      3. Color: To be selected by Architect from manufacturer's standard range.
I. Tamper-Resistant Polyurethane Sealant: ASTM C920, Grade NS, Uses M, G, and A; single or multicomponent; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
   2. Hardness Range: 50 to 60, Shore A, when tested in accordance with ASTM C661.

J. Epoxy Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Hardness Range: 65 to 75, Shore D, when tested in accordance with ASTM C661.
   2. Color: To be selected by Architect from manufacturer's standard range.
   3. Service Temperature Range: 40 to 120 degrees F.

K. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
   1. Color: Standard colors matching finished surfaces, Type OP (opaque).

L. Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

2.04 SELF LEVELING SEALANTS

A. Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
   1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.

B. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion.

C. Sealant Tape: Pre-formed expanding tape seal with modified liquid acrylic adhesive infused into cellular foam base material, with hydrophobic/hydrophilic chemistry.
   2. Substitutions: See Section 01.60.00 - Product Requirements.

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
   1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
   2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
   3. Open Cell: 40 to 50 percent larger in diameter than joint width.
   4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

2.06 ACOUSTIC SEALANTS AND ACCESSORIES

A. Sealant for Gypsum Board joints: USG “Acoustical Sealant” or equal by Tremco or Pecora.

B. Closed-cell tape sponge neoprene, 1/4 inch x 1 inch, Press-on Products (800-323-7467 or 630-628-2255), Part No. P-8200 or P-8100.

C. Foam Backer Rod: Closed cell polyethylene, ASTM C962. Acceptable Manufacturers: ITP, Nomeco, or approved equal. (Available through Tom Brown, Inc. 800-446-2298)

D. Non-Hardening Sealant:
   1. Non-hardening polyurethane type, ASTM C920, Type M, Class 25, Grade NS: Tremco “Dymeric 511” or approved equal.
   2. Non-hardening polysulphide type, ASTM C920, one-part: Pecora “GC-9” or approved equal.
   3. Non-hardening silicone type, ASTM C920, Type S, Class 25, Grade NS, one-part, low modulus type: GE “Silpruf”, Dow Corning 790, Tremco “Spectrum” 1 inch, Pecora 864, or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer’s instructions.

C. Perform preparation in accordance with manufacturer’s instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer’s requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker backing tape where backer rod cannot be used.
F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION 07.92.00
SECTION 08.14.16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Flush wood doors; flush and flush glazed configuration; non-rated and acoustical.

1.02 RELATED REQUIREMENTS
A. Section 06.20.00 - Finish Carpentry: Wood door frames.
B. Section 08.71.00 - Door Hardware.
C. Section 08.80.00 - Glazing.
D. Section 09.91.23 - Interior Painting: Field finishing of indicated doors.

1.03 REFERENCE STANDARDS
A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
D. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.

1.04 SUBMITTALS
A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
B. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   2. Include certification program label.
C. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
D. Specimen warranty.
E. Test Reports: Show compliance with specified requirements for the following:
   1. Fire resistance rating.
F. Manufacturer's Installation Instructions: Indicate special installation instructions.
G. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE
A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

D. Quality Certification:
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

E. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire-rating as indicated.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Package, deliver and store doors in accordance with specified quality standard.
B. Accept doors on site in manufacturer's packaging. Inspect for damage.
C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY
A. See Section 01.78.21 - Closeout Submittals, for additional warranty requirements.
B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 DOORS
A. Doors: Refer to drawings for locations and additional requirements.
   1. Quality Level: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS).
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at all locations.
   2. Wood veneer facing for field opaque finish as indicated on drawings.

2.02 DOOR AND PANEL CORES
A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

2.03 DOOR FACINGS
A. Veneer Facing for Transparent Finish: White birch, veneer grade in accordance with quality standard indicated, _____, with rotary cut between leaves of veneer, balance match of spliced veneer leaves assembled on door or panel face.
B. Veneer Facing for Opaque Finish: Medium density overlay (MDO), in compliance with indicated quality standard.

2.04 DOOR CONSTRUCTION
A. Fabricate doors in accordance with door quality standard specified.
B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.
C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.
E. Provide edge clearances in accordance with the quality standard specified.

2.05 FACTORY FINISHING - WOOD VENEER DOORS
A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. Stain: As selected by Architect.
      b. Sheen: Satin.

2.06 ACCESSORIES
A. Wood Door Frames: As specified in Section 06.20.00.
B. Glazing: As specified in Section 08.80.00.
C. Glazing Stops: Wood with metal clips for rated doors, butted corners; prepared for countersink style tamper proof screws.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION
A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install smoke and draft control doors in accordance with NFPA 105 requirements.
B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
C. Field-Finished Doors: Trimming to fit is acceptable.
   1. Adjust width of non-rated doors by cutting equally on both jamb edges.
   2. Trim maximum of 3/4 inch off bottom edges.
D. Use machine tools to cut or drill for hardware.
E. Coordinate installation of doors with installation of frames and hardware.
F. Coordinate installation of glazing.
G. Install door louvers plumb and level.

3.03 TOLERANCES
A. Comply with specified quality standard for fit and clearance tolerances.
B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING
A. Adjust doors for smooth and balanced door movement.
B. Adjust closers for full closure.

END OF SECTION 08.14.16
SECTION 08.43.13
ALUMINUM-FRAMED STOREFRONTS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Aluminum-framed storefront.
B. Aluminum doors.
C. Weatherstripping.
D. Perimeter sealant.

1.02  RELATED REQUIREMENTS

A. Section 07.25.00 - Weather Barriers: Sealing framing to weather barrier installed on adjacent construction.
B. Section 07.92.00 - Joint Sealants: Sealing joints between frames and adjacent construction.
C. Section 08.71.00 - Door Hardware: Hardware items other than specified in this section. Includes automatic entrances.
D. Section 08.80.00 - Glazing: Glass and glazing accessories.

1.03  REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
I. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).

1.04  ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.
B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05  SUBMITTALS

A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details and anchorage.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

E. Hardware Schedule: Coordinate with 08.71.00 - Door Hardware. Complete itemization of each item of hardware to be provided for each door that is not provided by 08.71.00.

F. Manufacturer’s Certificate: Certify that the products supplied meet or exceed the specified requirements.

G. Report of field testing for water leakage.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State in which the Project is located.

B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.

B. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

C. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN – FRAMING FOR INSULATED GLAZING

A. Exterior Front-Set Style, Structural Sealant Glazed Verticals, Thermally-Broken:
   1. Basis of Design: Kawneer Trifab 451 T
B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:

C. Substitution Procedures: See Section 01 60 00 - Product Requirements.

D. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.02 BASIS OF DESIGN – SWINGING DOORS

A. Wide Stile, Insulating Glazing, Thermally-Broken:
   2. Thickness: 2-1/4 inch.

B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:

C. Substitutions: See Section 01 60 00 - Product Requirements.

D. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Exterior framing shall be thermally-broken.
   2. Glazing Rabbet: For 1 inch insulating glazing.
   5. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
   7. Air Infiltration Test Pressure Differential: 1.57 psf.
   8. Finish: Class II natural anodized.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
   10. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   11. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   12. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   13. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
14. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

15. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.


B. Performance Requirements:

1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   a. Design Wind Loads: Comply with requirements of ASCE 7.
   b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

2. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

3. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at specified differential pressure across assembly in accordance with ASTM E283.

4. Condensation Resistance Factor: Measure in accordance with AAMA 1503 with 1 inch insulating glass installed.

5. Water Leakage: None, when measured in accordance with ASTM E331 at specified pressure differential.

6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

7. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.

8. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular thermally-broken aluminum sections, drainage holes and internal weep drainage system.
   1. Framing members for interior applications need not be thermally broken.
   2. Glazing Stops: Flush.

B. Glazing: As specified in Section 08.80.00.

C. Swing Doors: Glazed aluminum.
   2. Top Rail: 4 inches wide.
5. Glazing Stops: Square.
6. Finish: Same as storefront and/or curtainwall.

2.05 MATERIALS
C. Fasteners: Stainless steel.
D. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.
E. Concealed Flashings: Sheet aluminum, 26 gage, 0.017 inch minimum thickness.
F. Perimeter Sealant: As specified in Section 07.92.00.
G. Glass: As specified in Section 08.80.00.
H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
I. Glazing Accessories: As specified in Section 08.80.00.
J. Shop and Touch-Up Primer for Steel Components: SSPC-Paint 25, zinc oxide, alkyd, linseed oil primer.
K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.06 FINISHES
A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

2.07 HARDWARE
A. Door Hardware: As specified in Section 08.71.00.
B. Other Door Hardware: Storefront manufacturer’s standard type to suit application, for balance of hardware.
C. Automatic Door Operators and Actuators: As specified in Section 08.71.00.

2.08 FABRICATION
A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
C. Prepare components to receive anchor devices. Fabricate anchors.
D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
E. Arrange fasteners and attachments to conceal from view.
F. Reinforce components internally for door hardware and door operators.
G. Reinforce framing members for imposed loads.
H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify dimensions, tolerances, and method of attachment with other work.
B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION
A. Install wall system in accordance with manufacturer’s instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
J. Install operating sash.
K. Set thresholds in bed of sealant and secure.
L. Install hardware using templates provided.
   1. See Section 08.71.00 for hardware installation requirements.
M. Install glass in accordance with Section 08.80.00, using glazing method required to achieve performance criteria.
N. Install perimeter sealant in accordance with Section 07.90.05.
O. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES
A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL
A. See Section 01.40.00 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.
3.05 ADJUSTING
   A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING
   A. Remove protective material from pre-finished aluminum surfaces.
   B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
   C. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION
   A. Protect installed products from damage during subsequent construction.

END OF SECTION 08.43.13
SECTION 08.71.00
DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY

A. Section includes furnishing, installation and commissioning of door hardware for doors specified in “Hardware Sets” and required by actual conditions: including screws, bolts, expansion shields, electrified door hardware, and other devices for proper application of hardware.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Related Divisions:
   1. Division 08 Openings
   2. Division 09 Finishes

1.02 REFERENCES

A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI):
   1. ANSI/BHMA A156.1 Butts & Hinges (2016)
   2. ANSI/BHMA A156.2 Bored & Preassembled Locks & Latches (2011)
   3. ANSI/BHMA A156.3 Exit Devices (2014)
   4. ANSI/BHMA A156.4 Door Controls – Closers (2013)
   5. ANSI/BHMA A156.6 Architectural Door Trim (2015)
   6. ANSI/BHMA A156.7 Template Hinge Dimensions (2016)
   7. ANSI/BHMA A156.16 Auxiliary Hardware (2013)
   8. ANSI/BHMA A156.18 Materials & Finishes (2016)
   9. ANSI/BHMA A156.21 Thresholds (2014)

B. International Code Council/American National Standards Institute (ICC/ANSI)/ADA:

C. Underwriters Laboratories, Inc. (UL):
   1. UL 10C Positive Pressure Fire Test of Door Assemblies.
   2. UL 1784 Air Leakage Test of Door Assemblies.
   3. UL 294 Access Control System Units

D. Door and Hardware Institute (DHI):
   2. DHI Publication – Abbreviations and Symbols.

E. National Fire Protection Agency (NFPA):
   1. NFPA 70 National Electrical Code 2008
   2. NFPA 80 Standard for Fire Doors and Other Opening Protectives 2007
   4. NFPA 105 Standard for the Installation of Smoke Door Assemblies 2007
1.03 SUBMITTALS

A. Submit in accordance with Conditions of the Contract and Section 00.72.00 General Conditions, Paragraph 7.

B. Shop Drawings:
   1. Organize hardware schedule in vertical format as illustrated in DHI Publications Sequence and Formatting for the Hardware Schedule. Include abbreviations and symbols page according to DHI Publications Abbreviations and Symbols. Complete nomenclature of items required for each door opening as indicated.
   2. Coordinate final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of hardware.
   3. Architectural Hardware Consultant (AHC), as certified by DHI, who will affix seal attesting to completeness and correctness, including the review of the hardware schedule prior to submittal.

C. Submit manufacturer's catalog sheet on design, grade, and function of items listed in hardware schedule. Identify specific hardware item per sheet, provide an index, and cover sheet.

D. Coordination:
   1. Upon final approval of the architectural hardware schedules, submit one set of complete templates for each hardware item to the door manufacturers, frame manufacturers, and the installers. Date and index, including detailed lists of the hardware location requirements for mortised and surface applied hardware within fourteen days of receiving approved door hardware submittals.

E. Closeout Submittals: Submit to Owner in a three-ring binder or CD if requested.
   1. Warranties.
   3. Maintenance service agreement.
   4. Record documents.
   5. Copy of approved hardware schedule.
   6. Copy of approved keying schedule with bitting list.
   7. Door hardware supplier name, phone number, and fax number.

1.04 QUALITY ASSURANCE

A. Listed and Labeled electrified door hardware as defined in NFPA 70, Article 100, by a testing agency acceptable to authority having jurisdiction.

B. Hardware supplier will employ an Architectural Hardware Consultant (AHC) as certified by DHI and a member of the seal program who will be available at reasonable times during course of work for Project hardware consultation.

C. Door hardware conforming to ICC/ANSI A117.1: Handles pulls, latches locks and operating devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.

D. Door hardware certified to ANSI/BHMA standards as noted, participate and be listed in BHMA Certified Products Directory.

E. Substitution request: Comply with requirements in Section 00.72.00 General Conditions, Paragraph 4.

F. Keying Meeting
1. Within fourteen days of receipt of approved door hardware submittals, contact Owner with representative from hardware supplier to establish a keying conference. Verify keyway, visual key identification, number of master keys and keys per lock. Provide keying system per Owner’s instructions.

G. Installer Qualifications: Specialized in performing installation of this Section and have five years minimum documented experience.

H. Hardware listed in 3.07 – Hardware Schedule is intended to establish minimum level of design, type, function and grade.

1.05 DELIVERY, STORAGE AND HANDLING

A. Provide clean, dry and secure room for hardware delivered to Project but not yet installed. Shelve hardware off of the floor. Large items of hardware shall be stored on wooden pallets. Arrange locksets and keyed cylinders by opening number. Organize the balance of hardware by brand, model of hardware, and hardware set number. Leave the door markings of the hardware visible for installers.

B. Furnish hardware with each unit marked and numbered in accordance with approved finish hardware schedule. Include architect’s opening number, hardware set number, and item number for each type of hardware. Include keyset symbols and corresponding hardware component for keyed products.

C. Pack each item complete with necessary parts and fasteners in manufacturer’s original packaging.

D. Deliver architectural hardware to the job site according to the phasing agreed upon in the pre-installation meeting. Inventory the delivery with the supplier’s assistance. Immediately note shortages and damages on the shipping receipts and bill of lading. Coordinate replacement or repair with the supplier.

E. Deliver permanent keys, cores directly to Owner via registered mail or overnight package service. Establish the instructions for delivery to Owner at “Keying Conference.”

F. Waste Management and Disposal: Separate waste materials for use or recycling in accordance with Division 1.

1.06 WARRANTY

A. General Warranty: Owner may have under provisions of the Contract Documents and be an addition and run concurrently with other warranties made by Contractor under requirements of the Contract documents.

B. Special Warranty: Warranties specified in this article will not deprive Owner of other rights.

1. Ten years for manual door closers.

2. Five years for mortise, auxiliary and bored locks.

3. Five years for exit devices.

C. Replace or repair defective products during warranty period in accordance with manufacturer’s warranty at no cost to Owner. There is no warranty against defects due to improper installation, abuse, and failure to exercise normal maintenance.

D. Maintenance Tool and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner’s continued adjustment, maintenance, removal and replacement of door hardware.
PART 2 PRODUCTS

2.01 Hinges

A. Hinges, electric hinges, and self-closing hinges of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Products to be certified and listed by the following:

C. Butt Hinges:
   1. Hinge weight and size unless otherwise indicated in hardware sets:
      a. Doors up to 36” wide and up to 1-3/4” thick provide hinges with a minimum thickness of .134” and a minimum of 4-1/2” in height.
      b. Doors from 36” wide up to 42” wide and up to 1-3/4” thick provide hinges with a minimum thickness of .145” and a minimum of 4-1/2” in height.
      c. For doors from 42” wide up to 48” wide and up to 1-3/4” thick provide hinges with a minimum thickness of .180” and a minimum of 5” in height.
      d. Doors greater than 1-3/4” thick provide hinges with a minimum thickness of .180” and a minimum of 5” in height.
      e. Width of hinge is to be minimum required to clear surrounding trim.
   2. Base material unless otherwise indicated in hardware sets:
      a. Exterior Doors: 304 Stainless Steel, Brass or Bronze material.
      b. Interior Doors: Steel material.
      c. Fire Rated Doors: Steel or 304 Stainless Steel materials.
      d. Stainless Steel ball bearing hinges to have stainless steel ball bearings. Steel ball bearings are unacceptable.
   3. Quantity of hinges per door unless otherwise stated in hardware sets:
      a. Doors up to 60” in height provide 2 hinges.
      b. Doors 60” up to 90” in height provide 3 hinges.
      c. Doors 90” up to 120” in height provide 4 hinges.
      d. Doors over 120” in height add 1 additional hinge per each additional 30” in height.
      e. Dutch doors provide 4 hinges.
   4. Hinge design and options unless otherwise indicated in hardware sets:
      a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
      b. Out-swinging exterior and out-swinging access controlled doors are required to have Non-Removable Pins (NRP) to prevent removal of pin while door is in closed position.
      c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
      d. When shims are necessary to correct frame or door irregularities, provide metal shims only.
   5. Acceptable Manufacturers:
      | Standard Weight |
      |-----------------|
      | 1. Hager BB1279/BB1191 |
      | 2. Bommer BB5000/BB5002 |
      | 3. McKinney TA2714/TA2314 |
2.02 LOCKS AND LATCHES

A. Locks and latches of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Product to be certified and listed by following:
   1. ANSI/BHMA A156.2 Series 4000 Certified to Grade 1.
   2. ANSI/BHMA A250.13 Certified for a minimum design load of 1150 lbf (100 psf) for single out-swinging doors measuring 36” in width and 84” in height and a minimum design load of 1150lbf (70psf) for out-swinging single doors measuring 48” in width and 84” in height.
   3. UL/cUL Labeled and listed for functions up to 3 hours for single doors up to 48” in width and up to 96” in height.
   4. UL10C/UBC 7-2 Positive Pressure Rated.
   5. ICC/ANSI A1117.1

C. Lock and latch function numbers and descriptions of manufacturer’s series as listed in hardware sets.

D. Material and Design:
   1. Lock and latch chassis to be zinc dichromate for corrosion resistance.
   2. Keyed functions to be of a freewheeling design to help resist against vandalism.
   3. Non-handed, field reversible.
   4. Thru-bolt mounting with no exposed screws.
   5. Levers, zinc cast and plated to match finished designation in hardware sets.
   6. Roses, wrought brass or stainless steel material.

E. Latch and Strike:
   1. Stainless Steel latch bolt with minimum of 1/2” throw and deadlocking for keyed and exterior functions. Provide 3/4” latch bolt for pairs of fire-rated doors where required by door manufacturer. Standard backset to be 2-3/4” and adjustable faceplate to accommodate a square edge door or a standard 1/8” beveled edge door.
   2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4” x 4-7/8” with proper lip length to protect surrounding trim.

F. Options:
   1. Doors requiring lead line protection – provide locks with 1/16” lead applied to lock and 1/16” lead wrapped around latch bolt.
   2. Provide knurled levers on entry side of doors that are potentially dangerous to visually impaired persons.

G. Acceptable manufacturers:
   1. Hager 3400 Series
   2. Schlage ND Series
   3. Best 9K Series

2.03 EXIT DEVICES

A. Exit Devices of one manufacturer as listed for continuity of design and consideration of warranty. Touchpad type, finish to match balance of door hardware.

B. Standards: Manufacturer to be certified and/or listed by the following:
   1. BHMA Certified ANSI A156.3 Grade 1.
   2. UL/cUL Listed for up to 3 hours for “A” labeled doors.
   3. UL10C/UBC 7-2 Positive Pressure Rated.
4. UL10B Neutral Pressure Rated.
5. UL 305 Listed for Panic Hardware.
7. ANSI/BHMA A250.13 Severe Windstorm Resistant Component.

C. Material and Design:
   1. Provide exit devices with actuators that extend a minimum of one-half of door width.
   2. Where trim is indicated in hardware sets provide the lever design to match design of lock levers.
   3. Exit device to mount flush with door.
   4. Latchbolts:
      a. Rim device – 3/4” throw, Pullman type with automatic dead-latching, stainless steel
      b. Surface vertical rod device – Top 1/2” throw, Pullman type with automatic dead-latching, stainless steel. Bottom 1/2” throw, Pullman type, held retracted during door swing, stainless steel.
   5. Fasteners: Wood screws, machine screws, and thru-bolts.

D. Lock and Latch Functions: Function numbers and descriptions of manufacturer’s series and lever styles indicated in door hardware sets.

E. Acceptable Manufactures:
   1. Hager 4500 Series
   2. Von Duprin 99 Series
   3. Sargent 80 Series

2.04 CYLINDERS AND KEYING

A. Cylinders of one manufacturer as listed for continuity of design and consideration of warranty.

B. Products to be certified and listed by the following:
   1. Auxiliary Locks: ANSI/BHMA A156.5
   2. DHI Handbook “Keying systems and nomenclature” (1989)

C. Cylinders:
   1. Manufacturer’s standard tumbler type, seven-pin IC core supported by the Hager H1 keyway.
   2. Furnish with cams/tailpieces as required for locking device that is being furnished for project.

D. Keying:
   1. Copy of Owners approved keying schedule submitted to Owner and Architect with documentation of which keying conference was held and Owner’s sign-off.
   2. Provide a bitting list to Owner of combinations as established, and expand to twenty-five percent for future use or as directed by Owner.
   3. Key into Owner’s existing keying system if applicable.
   4. Keys to be shipped to Owner’s Representative, individually tag per keying conference.
   5. Provide visual key control identification on keys.
   6. Provide construction interchangeable cores with 5 construction keys

E. Acceptable Manufacturers:
   1. Hager
   2. Schlage
   3. Sargent
2.05 PUSH/PULL BARS

A. Pull Bar Sets: 1” round bar stock with 2 –1/2” clearances from face of door.

B. Acceptable Manufacturers:
   1. Hager H13J
   2. Rockwood
   3. Trimco

2.06 CLOSERS

A. Closers of one manufacturer as listed for continuity of design and consideration of warranty, unless otherwise indicated on hardware schedule, comply with manufacturer’s recommendations for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirement, and fire rating.

B. Standards: Manufacturer to be certified and or listed by the following:
   1. BHMA Certified ANSI A156.4 Grade 1.
   2. ADA Complaint ANSI A117.1.
   3. UL/cUL Listed up to 3 hours.
   4. UL10C Positive Pressure Rated.
   5. UL10B Neutral Pressure Rated.

C. Material and Design:
   1. Provide cast iron non-handed bodies with full plastic covers.
   2. Closers will have separated staked adjustable valve screws for latch speed, sweep speed, and backcheck.
   3. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting.
   4. One-piece seamless steel spring tube sealed in hydraulic fluid.
   5. Double heat-treated steel tempered springs.
   7. Triple heat-treated steel spindle.
   8. Full rack and pinion operation.

D. Mounting:
   1. Out-swing doors use surface parallel arm mount closers except where noted on hardware schedule.
   2. In-swing doors use surface regular arm mount closers except where noted on hardware schedule.
   3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
   4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.

E. Size closers in compliance with requirements for accessibility (ADAAG). Comply with following maximum opening force requirements.
   1. Interior hinged openings: 5.0 lbs.
   2. Fire-rated and exterior openings use minimum opening force allowable by authority having jurisdiction.

F. Fasteners: Provide self-reaming, self-tapping wood and machine screws, and sex nuts and bolts for each closer.

G. Acceptable manufacturers:
   1. Hager 5100 Series
2.07 PROTECTIVE TRIM

A. Protective trim of one manufacturer as listed for continuity of design and consideration of warranty.

B. Size of protection plate: single doors, size two inches less door width (LDW) on push side of door, and one inch less door width on pull side of door. For pairs of doors, size one inch less door width (LDW) on push side of door, and 1/2 inch on pull side of door. Adjust sizes to accommodate accompanying hardware, such as, edge guards, astragals and others.
   1. Kick Plates 10” high or sized to door bottom rail height.
   2. Mop Plates 4” high.
   3. Armor Plates 36” high.

C. Products to be certified and listed by the following:
   2. UL.

D. Material and Design:
   1. 0.050” gage stainless steel.
   2. Corners square, polishing lines or dominant direction of surface pattern so they run across door width of plate.
   3. Bevel top, bottom, and sides uniformly leaving no sharp edges.
   4. Countersink holes for screws. Space screw holes so they are no more than eight inches CTC, along a centerline not over 1/2” in from edge around plate. End screws maximum of 0.53” from corners.

E. UL label stamp required on protection plates when top of plate is more than 16 inches above bottom of door on fire rated openings. Verify door manufacturer’s UL listing for maximum height and width of protection plate to be used.

F. Acceptable Manufacturers:
   1. Hager 190S
   2. Trimco
   3. Burns

2.08 STOPS

A. Stops and holders of one manufacturer as listed for continuity of design and consideration of warranty.

B. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted in concrete floor or masonry walls have stainless steel machine screws and lead expansion shields.

C. Products to be certified and listed by the following:
   1. Auxiliary Hardware: ANSI/BHMA A156.16.

D. Acceptable Manufacturers:

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<tr>
<th>Convex</th>
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<tr>
<td>Hager</td>
<td>232W</td>
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<td></td>
<td>236W</td>
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<tr>
<td>Rockwood</td>
<td></td>
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</tbody>
</table>
3. Burns

2.09 THRESHOLDS

A. Thresholds of one manufacturer as listed for continuity of design and consideration of warranty.

B. Set thresholds for exterior and acoustical openings in full bed of sealant with lead expansion shields and stainless steel machine screws complying with requirements specified in Division 7 Section “Joint Sealants: Notched in field to fit frame by hardware installer. Refer to Drawings for special details.

C. Standards: Manufacturer to be certified by the following:

D. Acceptable Manufacturers:
   1. Hager 417S / 520S
   2. K.N. Crowder
   3. Reese

2.10 DOOR GASKETING AND WEATHERSTRIP

A. Door gasketing and weatherstrip of one manufacturer as listed for continuity of design and consideration of warranty.

B. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide noncorrosive fasteners for exterior applications.
   1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
   2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
   3. Door buttons: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
   4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.
   5. Drip Guard: Apply to exterior face of frame header. Lip length to extend 4” beyond width of door.

C. Products to be certified and listed by the following:
   1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22.
   2. BHMA certified for door sweeps, automatic door bottoms, and adhesive applied gasketing.

D. Refer to Section 08 1416 Wood Doors for Category A or Category B. Comply with UBC 7-2 and UL10C positive pressure where frame applied intumescent seals are required.

E. Acceptable Manufacturers:
   1. Perimeter Gasketing:  
      a. Hager 881S
      b. K.N. Crowder
      c. Reese
   2. Meeting Stile Weatherstrip:  
      a. Hager 756S
      b. K.N. Crowder
2.11 BARN DOOR HARDWARE
   A. Stainless Steel Barn Door Hardware: Provide complete sets of rails, hangers, supports, bumpers, floor guides, and accessories indicated. Products to be certified and listed by ANSI/BHMA A156.14 Grade 1.
   B. Rated for doors weighing up to 250 lbs. depending on hanger style.
   C. System includes Stainless steel track with two end caps, hanger wall brackets, door bottom guide, mounting and installation hardware.
   D. Black Aluminum Rail Barn Door Hardware: Provide complete sets of rails, hangers, supports, bumpers, floor guides, and accessories indicated. Products to be certified and listed by ANSI/BHMA A156.14 Grade 1.
   E. Rated for doors weighing up to 250 lbs.
   F. System includes: Black aluminum rail, two carriers, two stops, floor guide, rail mounting brackets, and fasteners.
   G. Acceptable Manufacturers:
      1. Hager:
         a. 9452 3” hook, face mount
         b. 9453 5” hook, face mount
         c. 9454 3” strap, face mount
         d. 9455 3” top mount
         e. 1-269-9693 privacy latch
         f. 1-269-8694 flush pull
         g. 9450 rail
      2. Approved equal:

2.12 SILENCERS
   A. Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame and four per Dutch door frame.
   B. Products to be certified and listed by the following:
      1. Auxiliary Hardware: ANSI/BHMA A156.16
   C. Acceptable Manufacturers:
      Hollow Metal Frame
      1. Hager 307D
      2. Rockwood
      3. Trimco
2.13 KEY CABINET
   A. Provide key cabinet; surface mounted to wall.
   B. Key control system:
      1. Include two sets of key tags, hooks, labels, and envelopes.
      2. Contain system in metal cabinet with baked enamel finish.
      3. Capacity will be able to hold actual quantities of keys, plus 50 percent.
      4. Provide tools, instruction sheets, and accessories required to complete installation.
   C. Acceptable Manufacturers:
      1. Lund Equipment
      2. Telkee Incorporated
      3. Key Control

2.14 FINISHES
   A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within 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 range of approved samples.
   B. Comply with base material and finish requirements indicated by ANSI/BHMA A156.18 designations in hardware schedule.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Examine doors and frames, with Installers present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

3.02 INSTALLATION
   A. Install hardware using manufactures recommended fasteners and installation instructions, at height locations and clearance tolerances that comply with:
      1. NFPA 80
      2. NFPA 105
      3. ICC/ANSI A117.1
      4. ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames
      5. ANSI/BHMA A156.115W hardware Preparation in Wood Doors with Wood or Steel Frames
      6. DHI Publication – Installation Guide for Doors and Hardware
      7. Approved shop drawings
      8. Approved finish hardware schedule
   B. Install soffit mounted gaskets prior other soffit mounted hardware to provide a continuous seal around the perimeter of the opening without cutting or notching.
   C. Install door closers so they are on the interior of the room side of the door. Stairwell doors will have closers mounted on the stair side and exterior doors will be mounted on the interior side of the building.
   D. In drywall applications provide blocking material of sufficient type and size for hardware items that mount directly to the wall.
E. Locate wall mounted bumper to contact the trim of the operating trim.

F. Mount mop and kick plates flush with the bottom of the door and centered horizontally on the door.

G. Set thresholds for exterior, and acoustical doors at sound control openings in full bed of sealant complying with requirements specified in Division 07 Section “Joint Sealants” forming a tight seal between threshold and surface to which set.

H. Anchor all components firmly into position and use anchoring devices furnished with the hardware item, unless otherwise specified.

I. Do not install surface mounted items until finishes have been completed on substrates involved. Set unit level, plumb and true to line location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

3.03 FIELD QUALITY CONTROL

A. Material supplier to schedule final walk through to inspect hardware installation ten (10) business days before final acceptance of Owner. Material supplier will provide a written report detailing discrepancies of each opening to General Contractor within seven (7) calendar days of walk through.

3.04 ADJUSTMENT, CLEANING AND DEMONSTRATING

A. Adjustment: Adjust and check each opening to ensure proper operation of each item of finish hardware. Replace items that cannot be adjusted to operate freely and smoothly or as intended for application at no cost to Owner.

B. Cleaning: Clean adjacent surfaces soiled by hardware installation. Clean finish hardware per manufacturer’s instructions after final adjustments have been made. Replace items that cannot be cleaned to manufacturer’s level of finish quality at no cost to Owner.

C. Conduct a training class for building maintenance personnel demonstrating the adjustment, operation of mechanical and electrical hardware. Special tools for finish hardware to be turned over and explained usage at the meeting.

3.05 PROTECTION

A. Leave manufacturer’s protective film intact and provide proper protection for all other finish hardware items that do not have protective material from the manufacture until Owner accepts project as complete.

3.06 HARDWARE SET SCHEDULE

A. Intent of Hardware Groups
   1. Should items of hardware not specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
   2. Where items of hardware aren’t correctly specified and are required for completion of the Work, a written statement of such omission, error, or other discrepancy is required to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
B. Guide: Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, performance, exposure, and like characteristics of door hardware, and may not be complete. Provide door hardware required to make each set complete and operational.

C. Hardware schedule does not reflect handing, backset, method of fastening, and like characteristics of door hardware and door operation.

D. Review door hardware sets with door types, frames, sizes and details on drawings. Verify suitability and adaptability of items specified in relation to details and surrounding conditions.
### 3.07 HARDWARE SCHEDULE

**SET #1**  
Doors: 101

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**SET #2**  
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**SET #3**  
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**SET #4**  
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END OF SECTION 08.71.00
SECTION 08.80.00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Glass.
B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS
A. Section 07.92.00 - Joint Sealants: Sealants for other than glazing purposes.
B. Section 08.14.16 - Flush Wood Doors: Glazed lites in doors.
C. Section 08.43.13 - Aluminum-Framed Storefronts:

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS
A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
D. Samples: Submit two samples 4 by 4 inch in size of glass and plastic units, showing coloration and design.
E. Certificates: Certify that products meet or exceed specified requirements.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01.60.00 - Product Requirements, for additional provisions.
   2. Extra Insulating Glass Units: One of each glass size and each glass type.

1.06 QUALITY ASSURANCE
   B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.07 FIELD CONDITIONS
   A. Do not install glazing when ambient temperature is less than 50 degrees F.
   B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY
   A. See Section 01.78.00 - Closeout Submittals, for additional warranty requirements.
   B. Sealed Insulating Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.01 INSULATING GLASS UNITS
   A. Type IG-1 - Sealed Insulating Glass Units: Vision glass, double glazed.
      1. Application: All exterior glazing unless otherwise indicated.
      2. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
         a. Tint: Clear.
         b. Coating: Low-E (passive type), on #2 surface.
      3. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
         a. Tint: Clear.
      4. Total Thickness: 1 inch.
      5. Total Visible Light Transmittance: 74 percent, nominal.
      6. Total Solar Heat Gain Coefficient: 0.41 percent, nominal.

2.02 GLAZING UNITS
   A. Fire-Protection-Rated Glazing:
      1. Safety Certification: 16 CFR 1201 Category II.
      2. Application: Provide this type of glazing in the following locations:
         a. Glazed lites in fire doors.
         b. Fire windows.
         c. Sidelights, borrow lites, and other glazed openings in partitions indicated as having an hourly fire rating.
         d. Other locations indicated on the drawings.
      3. Fire Rating: As indicated on the drawings.
      4. Type: Glass-ceramic safety glazing.
5. Thickness: 1/4 inch.

B. Single Safety Glazing: Non-fire-rated.
   1. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in doors, except fire doors.
      b. Glazed sidelights to doors, except in fire-rated walls and partitions.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on the drawings.
   2. Type: Fully tempered float glass as specified.
   3. Tint: Clear.
   4. Thickness: 1/4 inch.

2.03 EXTERIOR GLAZING ASSEMBLIES

A. Performance Criteria: Select type and thickness of glass to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
   2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
   3. Glass thicknesses listed are minimum.

B. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
   1. In conjunction with vapor retarder and joint sealer materials described in other sections.
   2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.04 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless noted otherwise.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
   2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
   3. Tinted Types: ASTM C1036, Class 2 - Tinted, color and performance characteristics as indicated.
   4. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

B. Fire-Protection-Rated Glazing: Type, thickness, and configuration as required to achieve indicated ratings.
   1. IBC Fire Protection Rating: As indicated on drawings.
   2. Provide products listed by Underwriters Laboratories or Intertek Warnock Hersey.
   3. Labeling: Provide permanent label on each piece giving the IBC rating and other information required by the applicable code.

C. Glass-Ceramic Safety Glazing: UL- or WH-listed as fire-protection-rated glazing and complying with 16 CFR 1201 test requirements for Category II without the use of a surface-applied film.
   1. 20-Minute Fire Doors: Hose stream test is not required.
   2. Products:
      b. SCHOTT North America Inc; Pyran Platinum L (laminated) Fire Rated Ceramic Glass.
2.05 SEALED INSULATING GLASS UNITS

A. Manufacturers:
   1. Fabricator certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.
   2. Substitutions: Refer to Section 01.60.00 - Product Requirements.

B. Sealed Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Edge Spacers: Aluminum, bent and soldered corners.
   3. Edge Seal: Glass to elastomer with supplementary silicone sealant.
   4. Purge interpane space with dry hermetic air.

2.06 GLAZING COMPOUNDS

A. Manufacturers:
   5. Substitutions: Refer to Section 01.60.00 - Product Requirements.

B. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; grey color.

C. Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

D. Acrylic Sealant: Single component, solvent curing, non-bleeding; ASTM C920, Type S, Grade NS, Class 12-1/2, Uses M and A; cured Shore A hardness of 15 to 25; color as selected.

E. Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C920, Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

F. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; color as selected.

G. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.07 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; selected color.

E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealants in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION 08.80.00
PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Performance criteria for gypsum board assemblies.
   C. Acoustic insulation.
   D. Gypsum sheathing.
   E. Cementitious backing board.
   F. Gypsum wallboard.
   G. Joint treatment and accessories.
   H. Water-resistive barrier over exterior wall sheathing.

1.02  RELATED REQUIREMENTS
   A. Section 06.10.00 - Rough Carpentry: Wood blocking product and execution requirements.
   B. Section 09.22.16 - Non-Structural Metal Framing.

1.03  REFERENCE STANDARDS
   H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
   I. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.


O. ASTM E413 - Classification for Rating Sound Insulation; 2010.


Q. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.

1.04 SUBMITTALS
A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
D. Product Data: Provide manufacturer’s data on partition head to structure connectors, showing compliance with requirements.
E. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum three years of experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES
A. Provide completed assemblies complying with ASTM C840 and GA-216.
B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 55-59 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.02 WOOD FRAMING MATERIALS
A. As specified in Section 06.10.00 – Rough Carpentry

2.03 METAL FRAMING MATERIALS
A. Non-Loadbearing Framing System Components: As specified in Section 09.22.16.
B. Exterior Non-Loadbearing Studs and Furring for Application of Gypsum Board: As specified in Section 09.22.16.
C. Exterior Loadbearing Framing System Components: As specified on Structural Drawings.
D. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and screwed to secondary deflection channel set inside but unattached to top track.
2.04 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Unfaced fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
   3. Thickness:

B. Impact Resistant Wallboard:
   1. Application: toilet building from 7'-4" AFF to bottom of ceiling..
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Type: Fire resistance rated Type X, UL or WH listed.
   5. Edges: Tapered.

C. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
   1. Application: Vertical surfaces behind thinset tile, except in wet areas.
   2. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut. For all areas greater than 120 square feet and are not accessible, provide a 24" x 24" accessible panel. Coordinate location with Mechanical.
   1. Application: Ceilings, unless otherwise indicated.
   2. Thickness: 5/8 inch.

2.05 GYPSUM WALLBOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3.5 inch.

B. Beads, Joint Accessories, and Other Trim: ASTM C1047, paintable galvanized steel or rolled zinc, unless noted otherwise.
   1. Corner Beads: Low profile, for 90 degree outside corners.

C. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

D. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

G. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3  EXECUTION

3.01  EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02  FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

C. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
   1. Orientation: Horizontal.
   2. Spacing: As indicated.

F. Acoustic Furring: Install resilient channels at maximum 16 inches on center. Locate joints over framing members.

G. Furring for Fire Ratings: Install as required for fire resistance ratings indicated.

H. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Wall mounted cabinets.
   3. Plumbing fixtures.
   4. Toilet partitions.
   5. Toilet accessories.
   6. Wall mounted door hardware.

3.03  ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
1. Place one bead continuously on substrate before installation of perimeter framing members.
2. Place continuous bead at perimeter of each layer of gypsum board.
3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.04 BOARD INSTALLATION
A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
E. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
F. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
G. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.05 INSTALLATION OF TRIM AND ACCESSORIES
A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
   2. At exterior soffits, not more than 30 feet apart in both directions.
B. Corner Beads: Install at external corners, using longest practical lengths.
C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
D. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations indicated on drawings. Provide vent area specified.

3.06 JOINT TREATMENT
A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   4. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.07 TOLERANCES
   A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION 09.21.16
SECTION 09.22.16
NON STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Metal partition, ceiling, and soffit framing.
B. Wall vibration control components.
C. Framing accessories.

1.02 RELATED REQUIREMENTS
A. Section 06.10.00 - Rough Carpentry: Wood blocking within stud framing.
B. Section 07.21.00 - Thermal Insulation: Acoustic insulation.
C. Section 09.21.16 - Gypsum Board Assemblies: Wood studs for gypsum board partition framing.

1.03 REFERENCE STANDARDS
A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
H. ASTM E413 - Classification for Rating Sound Insulation; 2010.

1.04 SUBMITTALS
A. See Section 00.72.00- General Conditions, Paragraph 7, for submittal procedures.
B. Shop Drawings:
   1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
   2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.
C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Sustainable Design Submittal: Documentation of recycled content and location of manufacture.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 FRAMING MATERIALS

A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
   1. Studs: C shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.

B. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   3. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.

C. Fasteners: ASTM C1002 self-piercing tapping screws.

D. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced.

E. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

F. Vibration Control Components: Stamped L-Shaped steel brackets (single or double L as required by the load application), captured and held securely by a neoprene element with two anchoring points. The brackets are used to resiliently decouple and support partitions, head-of-wall, soffits, plumbing and fixtures in sound control ceilings and walls as shown in the Drawings. (See Section 13.48.23 for Spring Isolated Gypsum Ceilings where indicated on Drawings.)

2.02 FABRICATION

A. Fabricate assemblies of framed sections to sizes and profiles required.

B. Fit, reinforce, and brace framing members to suit design requirements.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that rough-in utilities are in proper location.

3.02 TOLERANCES
   A. Maximum Variation From True Position: 1/8 inch in 10 feet.
   B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION 09.22.16
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Tile for floor applications.
   B. Tile for wall applications.
   C. Ceramic accessories.

1.02 RELATED REQUIREMENTS
   A. Section 07.92.00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
   B. Section 09.21.16 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
   B. Product Data: Provide manufacturers’ data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
   C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
   D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.
   E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
   G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
      1. Extra Tile: 10 square feet of each size, color, and surface finish combination.

1.05 QUALITY ASSURANCE
   A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.
B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

C. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.06 MOCK-UP

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

2.02 TRIM AND ACCESSORIES

A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.

B. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.

   1. Manufacturers: Same as for tile.

C. Non-Ceramic Trim: Satin brass anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.

   1. Applications:
      a. Open edges of wall tile.
      b. Outside wall corners.
      c. Transition between floor finishes of different heights.
      d. Thresholds at door openings.

   2. Manufacturers:

D. Thresholds: Marble, white or gray, honed finish; 2 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.

2.03 SETTING MATERIALS

A. Manufacturers:


   2. Substitutions: See Section 01.60.00 - Product Requirements.

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4 or ANSI A118.15.

   1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.
2. Products:

2.04 GROUTS
A. Manufacturers:
B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
   1. Applications: Use this type of grout where indicated on Finish Legend.
   2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
   3. Color(s): As selected by Architect from manufacturer's full line.
C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
   1. Applications: Refer to Finish Legend.
   2. Color(s): As selected by Architect from manufacturer's full line.
D. Stain Resistant Grout Additive: Liquid admixture for sanded and unsanded cement-based grouts; mix with dry grout material in place of water.
   1. Applications: Refer to Finish Legend.

2.05 MAINTENANCE MATERIALS
A. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
   1. Composition: Water-based colorless silicone.
B. Grout Release: Temporary, water-soluble pre-grout coating.

2.06 ACCESSORY MATERIALS
A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
   1. Thickness: 20 mils, maximum.
   2. Crack Resistance: No failure at 1/8 inch gap, minimum.
   3. Products:
B. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
   1. Fluid or Trowel Applied Type:
      b. Thickness: 25 mils, minimum, dry film thickness.
C. Underlayment at Floors: Specifically designed for bonding to thin-set setting mortar; not primarily a waterproofing material and having the following characteristics:
   1. Do Not Use: Gypsum or cementitious based self-leveling underlayment.
   2. Type: Fluid or Trowel Applied.
      a. Products:
         1) LATICRETE International, Inc; LATICRETE 125 Sound and Crack Adhesive: www.laticrete.com/#sle.
D. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.
PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage. Vacuum clean surfaces and damp clean.

B. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

C. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a thru A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install ceramic accessories rigidly in prepared openings.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. Install thresholds where indicated.

I. Sound tile after setting. Replace hollow sounding units.

J. Keep control and expansion joints free of mortar, grout, and adhesive.

K. Keep expansion joints free of adhesive or grout. Apply sealant to joints.

L. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

M. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

N. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

O. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
3.04 INSTALLATION - FLOORS - THIN-SET METHODS
   A. Over wood substrates, install in accordance with TCNA (HB) straight-line troweling, Method F142, with standard grout, unless otherwise indicated.

3.05 INSTALLATION - WALL TILE
   A. Over cementitious backer units install in accordance with TCNA (HB) Method W223, organic adhesive.
   B. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.
   C. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

3.06 PROTECTION
   A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09.30.00
PART 1  GENERAL

1.01  SECTION INCLUDES

A. Surface preparation.
B. Field application of paints, stains, varnishes, and other coatings.
C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.
   3. Prime surfaces to receive wall coverings.
   4. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. Paint interior surfaces of air ducts and convectors and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically so indicated.
   8. Ceramic and other tiles.
   10. Glass.
   11. Acoustical materials, unless specifically so indicated.
   12. Concealed pipes, ducts, and conduits.

1.02  RELATED REQUIREMENTS

A. Section 05.51.00 - Metal Ladders and Railings: Shop-primed items.

1.03  DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04  REFERENCE STANDARDS


1.05 SUBMITTALS
A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   3. Manufacturer's installation instructions.
   4. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.
C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, submit each color in each sheen available.
   3. Allow 30 days for approval process, after receipt of complete samples by Architect.
   4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.
D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
F. Manufacturer's Instructions: Indicate special surface preparation procedures.
G. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01.60.00 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 gallon of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum 15 years documented experience.
B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years experience.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. 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.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each coating material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Colors: As indicated on drawings
   1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.02 PAINT SYSTEMS - EXTERIOR

A. Wood, Opaque, Alkyd, 3 Coat:
1. One coat of alkyd primer sealer.
2. Gloss: Two coats of alkyd enamel.

B. Wood, Transparent, Varnish, Stain:
   1. One coat of stain.
   2. One coat sealer.

C. Concrete/Masonry, Opaque, Alkyd, 3 Coat:
   1. One coat of block filler.

D. Gypsum Board and Plaster, Opaque, Latex, 3 Coat:
   1. One coat of latex primer sealer.
   2. Flat: Two coats of latex.

E. Ferrous Metals, Unprimed, Alkyd, 3 Coat:
   1. One coat of alkyd primer.
   2. Gloss: Two coats of alkyd enamel.

F. Ferrous Metals, Primed, Alkyd, 2 Coat:
   1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
   2. Gloss: Two coats of alkyd enamel.

G. Galvanized Metals, Alkyd, 3 Coat:
   1. One coat galvanize primer.
   2. Gloss: Two coats of alkyd enamel.

H. Pavement Marking Paint:
   1. White: One coat, with reflective particles.

2.03 PAINT SYSTEMS - INTERIOR
A. All Interior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, and aluminum.
   1. Two top coats and one coat primer.
   2. Eggshell: MPI gloss level 3; use this sheen for hard ceilings.
   3. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by occupants, including door frames and railings.
   4. Primer(s): As recommended by manufacturer of top coats.
      b. Concrete: Alkali Resistant Water Based Primer.
      c. Concrete Masonry: Latex Block Filler; heavy coat squeegeed into pores.
      d. Plaster: Interior Latex Primer Sealer.
      e. Clay Masonry: Alkali Resistant Water Based Primer.
      f. Wood: Latex Primer for Interior Wood.
      g. Wood: Interior Alkyd Primer Sealer.
      h. Steel, Uncoated: Anti-Corrosive Alkyd Primer for Metal.
      i. Steel, Uncoated: Rust-Inhibitive Water Based Primer.
j. Steel — Shop Primer: Quick Dry Alkyd Primer for Metal.
k. Galvanized Steel: Water Based Galvanized Primer.
l. Galvanized Steel: Cementious primer.
m. Aluminum: Quick Dry Primer for Aluminum.

B. Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:
   1. Two top coats and one coat primer.
   2. Satin: MPI gloss level 4; use this sheen at all locations.
   3. Primer(s): As recommended by manufacturer of top coats.

   1. Two top coats and one coat primer.
   2. Eggshell: MPI gloss level 3; use this sheen at hard ceilings.
   3. Satin: MPI gloss level 4; use this sheen at all locations not called for elsewhere.
   4. Primer(s): As recommended by manufacturer of top coats.

D. Heavy Duty Vertical and Overhead: Including gypsum board, plaster, concrete, concrete masonry, uncoated steel, shop primed steel, galvanized steel, and aluminum.
   1. Applications: See Finish Schedule.
   2. Two top coats and one coat primer; primer may be omitted if top coat manufacturer approves.
   3. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
   4. Primer(s): As recommended by manufacturer of top coats.

E. Transparent Finish on Wood, Unless Otherwise Indicated:
   1. 2 top coats over stain.
   3. Top Coat(s): Clear Water Based Varnish.
   4. Satin: MPI gloss level 4; use this sheen at all locations.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces 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. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.
F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Plaster and Stucco: 12 percent.
   3. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
   6. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION
A. Clean surfaces thoroughly and correct defects prior to coating application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
D. Seal surfaces that might cause bleed through or staining of topcoat.
E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
G. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
H. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
I. Concrete Floors and Traffic Surfaces to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
J. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
K. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
L. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
M. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
N. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

O. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

P. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

Q. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

R. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

C. Apply products in accordance with manufacturer's instructions.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

G. Sand wood and metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finished coatings until completion of project.
B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION 09.90.00
SECTION 10.28.00
TOILET ROOM ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Commercial toilet accessories.
   B. Under-lavatory pipe supply covers.
   C. Utility room accessories.
   D. Grab bars.

1.02 RELATED REQUIREMENTS
   A. Section 06.10.00 - Rough Carpentry: Concealed supports for accessories, including in wall framing and plates.

1.03 REFERENCE STANDARDS
   B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011.
   E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.
1.05 SUBMITTALS
   A. See Section 00.72.00 – General Conditions, Paragraph 7, for submittal procedures.
   B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
   C. Samples: Submit two samples of each accessory, illustrating color and finish.
   D. Manufacturer’s Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Commercial Toilet, Shower, and Bath Accessories:
      3. Substitutions: Section 01.60.00 - Product Requirements.
   B. Provide products of each category type by single manufacturer.

2.02 MATERIALS
   A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
      1. Grind welded joints smooth.
      2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
   B. Keys: Provide 2 keys for each accessory to Owner; master key lockable accessories.
   C. Stainless Steel Sheet: ASTM A666, Type 304.
   D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
   E. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
   F. Adhesive: Two component epoxy type, waterproof.
   G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
   H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES
   A. Stainless Steel: Satin finish, unless otherwise noted.
   B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.
   C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
   D. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.
   E. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
   F. Back paint components where contact is made with building finishes to prevent electrolysis.
2.04 COMMERCIAL TOILET ACCESSORIES

A. Basis of design and items called out are manufactured by Bobrick Washroom Equipment, unless noted otherwise. Products by other manufacturers are also acceptable.

B. Toilet Tissue Dispenser (TPD): VonDrehle 'Carousel', Model No. VDC3342.

C. Framed Mirror (MR): B-165, 18" x 36" unless otherwise noted on documents.

D. Soap Dispenser (SD): DEB Model No. WHB1LDS, wall mounted.

E. Surface Mounted Paper Towel Dispenser (PTD): B-262.

F. Robe Hook: B-2116.

G. Grab Bars (GBHXX): B-550 Series, configuration as indicated.

2.05 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:
   1. Insulate exposed drainage piping including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
   2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
   3. Construction: 1/8 inch flexible PVC.
      a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
      b. Comply with ASTM C1822, type indicated.
      c. Comply with ASME A112.18.9.
      d. Comply with ICC A117.1.
   5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.

2.06 UTILITY ROOM ACCESSORIES

A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
   1. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
   2. Length: 36 inches.
   3. Length: Manufacturer's standard length for number of holders/hooks.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify that field measurements are as indicated on drawings.

D. See Section 06.10.00 - Rough Carpentry for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.
B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
   1. Grab Bars: As indicated on drawings.
   2. Other Accessories: As indicated on drawings.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION 09.30.00
SECTION 12.36.00
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Countertops for manufactured casework.

1.02 RELATED REQUIREMENTS
A. Section 06.41.00 - Architectural Wood Casework.

1.03 REFERENCE STANDARDS
B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
G. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
I. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
J. PS 1 - Structural Plywood; 2009.

1.04 SUBMITTALS
A. See Section 00.72.00 - General Conditions, Paragraph 7, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.
C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
G. Installation Instructions: Manufacturer's installation instructions and recommendations.
H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.
1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

B. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.

C. Installer Qualifications: Fabricator.

1.06 DELIVERY, STORAGE AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Engineered Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
   1. Flat Sheet Thickness: 3 cm, minimum.

   2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.
      b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      c. Finish on Exposed Surfaces: Polished.

   3. Wall Panels: 1/2 inch, and 3/4 inch thick.

   4. Other Components Thickness: 3/4 inch, minimum.

   5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.

C. Wood Slab
   1. Species: Cherry
   2. Edge: “Live” natural edge on one side, opposite side straight.
   3. Thickness: Minimum 1-1/2”
      a. Fill knots, cracks, checks and cracks with epoxy resin and sand smooth

2.02 MATERIALS

A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch, unless indicated otherwise, except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

C. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.
3.06 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 12.36.00
SECTION 31.00.00
EARTHWORK

PART 1  GENERAL

1.01 SECTION INCLUDES

A. Work Included: Excavate and grade in the areas designated in the Contract Documents as shown on the grading plan and specified herein, which shall include but not be limited to, the following:
   1. Excavation and site preparation.
   2. Grading to establish subgrades based upon contours, cross-sections, and details for work including slabs, walks, pavements, gravel surfaces, and grassed areas.
   3. Controlled fill placement and observation.
   4. Excavation, backfilling and compaction.
   5. Dewatering or addition of water as required.
   6. Placing of topsoil and finish grading.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7 for submittal procedures
   2. Section 31.23.00 – Excavation and Fill
   3. Section 31.23.33- Trenching and Backfilling
   4. Section 32.91.19 - Topsoil Placement and Grading
   5. Section 32.92.19 – Seeding
   6. Section 33.03.00 – Utility Pipe and Materials
   7. Section 33.46.00 – Subdrainage

1.02 REFERENCES

A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
   1. American Association of State Highway and Transportation Officials Publications (AASHTO):
      a. M288: Geotextiles Used for Subsurface Drainage Purposes
      a. D448: Standard Classification for Sizes of Aggregate for Road and Bridge Construction
      b. D698: Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)
      c. D1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
      d. D1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)(2,700 kN-m/m³)
      e. D2216: Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
      f. D2487: Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
      g. D2922: Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
      h. D2937: Standard Test Methods for Density of Soil in Place by the Drive-Cylinder Method
1.03 DEFINITIONS

A. Controlled Fill: Controlled fill is fill required in all areas on which final grade is not placed on original excavated soil.

B. Satisfactory Materials: See Part 2 “Materials” for definition and specifications regarding satisfactory materials to be used on this project.

C. Unsatisfactory Materials: See Part 2 “Materials” for definition and specifications regarding unsatisfactory materials to be used on this project.

D. Excavation: Excavation consists of removal of material encountered regardless of character of materials and obstructions encountered to subgrade elevations indicated and subsequent disposal of materials removed.

E. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, asphalt or concrete pavement, building foundations or topsoil materials.

F. Unclassified Excavation: For the purposes of payment, material shall not be classified regardless of the type of material encountered.

G. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect/Engineer. Unauthorized excavation, as well as any resulting re-medial work directed by Architect/Engineer to correct such unauthorized excavations, shall be per-formed at no additional cost to the Owner.

H. Additional Excavation: Removal of materials beyond indicated subgrade elevations or dimensions at the specific direction of Architect/Engineer or geotechnical engineer. In all cases, the Contractor is responsible for performing excavations to subgrade elevations. Additional excavation may be required if bearing materials at required subgrade elevations are unsuitable as defined below.

I. Unsuitable Materials: Once excavation to subgrade, as herein defined, is complete, subgrade materials shall be evaluated by the geotechnical engineer. Subgrade materials shall be deemed “unsuitable” jointly by the geotechnical engineer and the Architect/Engineer, if they do not have the required bearing capacity, if they contain organic material, or if they exhibit...
other undesirable characteristics, and if they cannot be made suitable using conventional stabilizing methods, including but not limited to: discing, harrowing, etc. Additional payment will not be made for the use of conventional stabilizing methods. Payment for removal of unsuitable material and its replacement as recommended by the geotechnical engineer, when authorized by the Architect/Engineer, will be based on unit prices established in the Contract Documents; measurement of the volumes for these unit-price items will be performed by the geotechnical engineer.

J. Cohesionless and Cohesive Materials: Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Cohesionless materials include materials classified in ASTM D2487 as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the minus #40 fraction has a plasticity index of zero as classified by ASTM D4318.

K. Degree of Compaction: Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D698 or ASTM D1557 as specified, abbreviated above as a percent of laboratory maximum density.

L. Geotechnical Engineer: A representative of a commercial geotechnical testing laboratory which will provide the required quality assurance testing for the project; see Quality Assurance section below for additional specifications.

M. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

N. Topsoil: See Part 2 “Materials” for definition and specifications regarding topsoil materials to be used on this project.

O. Rock: See Part 2 “Materials” for definition and specifications regarding rock materials for this project.

1.04 SUBMITTALS

A. General: Submittals shall be in accordance with Section 01 3300 – Submittal Procedures. Copies of all test results and field and office worksheets shall be furnished to the Engineer within 72 hours after the tests are complete.

B. Test Reports: The testing agency shall submit following reports, in duplicate, directly to Architect/Engineer and Owner from the testing services, with copy to the Contractor.
   1. Test report on borrow material for soil classification.
   2. Field density reports and map of test location.
   3. One optimum moisture-maximum density curve for each type of soil used for controlled fill.
   4. Other reports of any testing hereinafter specified deemed necessary by Geotechnical Engineer or requested by the Owner and/or Engineer.
   5. A test location plan shall be included with each submittal.

1.05 QUALITY ASSURANCE

A. A. Geotechnical Engineer: The Owner shall retain a licensed independent Geotechnical Engineer and Test Laboratory approved by the Architect/Engineer to observe and confirm that earthwork meets the requirements of the specifications for density and moisture content. The Geotechnical Engineer shall at-tend the Pre-Construction Conference.

i. Geotechnical engineer of the testing agency shall be a registered engineer, geologist or his representative, subject to approval by the Architect/Engineer, regularly engaged in soils and foundation engineering with expertise in and full capability to do all material analysis,
observation, monitoring, and verification of earthwork operations. Any technician or representative of the testing agency performing testing shall be certified and have a minimum of five years of experience in the type of testing being performed. The geotechnical engineer or his representative shall be present on site sufficient time during grading, excavation and controlled fill placement to certify compliance with these specifications. The geotechnical engineer shall be on site a minimum of once a week and shall submit a progress/field report directly to the General Contractor with a copy to the Owner and Architect/Engineer. The geotechnical engineer shall also review and approve all field reports.

B. Inclement Weather: When fill operations are ceased due to weather (rain, freezing, snow, etc.), construction shall not be resumed until the Geotechnical Engineer has verified soil strength has not been adversely affected. If soil strength has been decreased, the affected portion of fill shall be rescarified, moistened, or dried as required and recompacted to the specified density.

C. Inspection: The Geotechnical Engineer shall continuously observe and monitor all filling and compacting operations so that he can certify that the fill was constructed in accordance with these specifications. The Geotechnical Engineer shall verify that the subgrade has been adequately prepared for filling, that acceptable quality and quantity of fill material is used in each lift, that the specified compaction is achieved in each lift, and that the proper size fill with proper slopes is built. The Geotechnical Engineer shall certify compliance with these specifications by letter mailed to the Owner, with copy to the Architect/Engineer, upon completion of the compaction.

D. Coordination: The Contractor shall coordinate the work with the Owner’s representative and Geotechnical Engineer by notifying the Owner’s representative and Geotechnical Engineer of scheduled work in advance. The Contractor shall coordinate work with other trades whose work will be affected on the site. The Contractor shall bear any cost incurred due to lack of coordination – i.e. geotechnical engineer present on site while no grading operations or other activity requiring testing is occurring.

E. Utilities: Prior to any excavation the Contractor shall verify the locations of all utilities which may be in the area.

F. Drainage: The Contractor shall be responsible for the proper drainage of the site during construction of the project. Water shall not be allowed to accumulate in any of the excavated areas. Storm or ground water collecting on site during construction shall be removed by pumping, ditching, or other suitable means.

1.06 SYSTEM DESCRIPTION
   A. Soil Bearing Capacity: Soil underneath all footings and structures shall have a minimum bearing capacity of 2000 pounds per square foot.

1.07 PROJECT CONDITIONS
   A. Topographic Survey: Existing topographic information is a field survey performed during 2018
   B. Subsurface Investigation:
      i. A subsurface investigation was not performed for this project.
   C. Existing Utilities: Underground utility locations shown are approximate and were determined from above ground features and existing utility maps. Locate existing underground utilities in
areas of work by hand dug test holes. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

1. The Contractor shall contact "Miss Utility" (simply dial 811) for marking of utilities 72 hours prior to any excavation or construction.
2. Should uncharted, incorrectly charted, unmarked in field, or incorrectly marked in the field, piping or other utilities be encountered during excavation, Contractor shall consult utility Owner immediately for directions. Contractor shall cooperate with Owner and utility companies in keeping respective services and facilities in operation, and shall repair or arrange for repair, damaged utilities to satisfaction of utility owner.
3. Contractor shall demolish and completely remove existing underground utilities as indicated on the plans and shall coordinate with utility companies for shut-off of services if lines are active. Utilities shall be abandoned in place only with approval from the Owner and utility provider.
4. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner, Architect/Engineer, and utility owner and then only after arranging to provide temporary utility services according to requirements indicated:
   a. Update the Owner and Architect/Engineer at each scheduled construction meeting for planned utility interruptions. Notify Owner and Architect/Engineer in writing not less than five days in advance of proposed utility interruptions.
   b. Do not proceed with utility interruptions without Owner and Architect/Engineer’s written permission.
   c. Contact utility-locator service for area where Project is located before excavating.

D. Blasting: Blasting will not be allowed for this project

E. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
   1. The Contractor shall operate warning lights as recommended by authorities having jurisdiction.
   2. The Contractor shall protect structures, utilities, sidewalks, pavements, trees and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
   3. The Contractor shall protect, maintain and restore bench marks, monuments, and other reference points affected by this work. If bench marks, monuments or other permanent reference points are displaced or destroyed, points shall be re-established and markers reset under supervision of a licensed Land Surveyor.

PART 2 PRODUCTS

2.01 MATERIALS

A. Satisfactory Soil Materials:
   1. Materials complying with ASTM D 2487 soil classification groups GW, GP, GM, GC, SW, SP, SM, SC, ML, MH, CL, CH may be used as fill material. It is generally desirable for fill material to have a plasticity index less than 25, and a liquid limit less than 50.
   2. If soils in the GC, SC, ML, MH, CL, CH groups, or soils whose plasticity or liquid limit exceed the above desirable limits are to be used as fill material, they shall be very closely monitored by the geotechnical engineer to ensure proper placement, compaction, and use of these materials.
3. Satisfactory soil materials shall be free of all debris, waste, construction debris, frozen materials, vegetable and other deleterious matter, including mica or graphite.

4. Materials for fills shall be secured from excavation after rejection of any unsuitable materials; materials from other sources may be used upon approval by the Geotechnical Engineer.

5. Satisfactory soil materials shall be free of rock or gravel in sizes and depths as follows:
   a. From subgrade to 18" below subgrade, 2" maximum particle size is allowed.
   b. From 18" below subgrade to 48" below subgrade, 4" maximum particle size is allowed.
   c. Deeper than 48" below subgrade in areas outside the building pad, particle sizes greater than 4" may be allowed at the discretion and at the direction of the geotechnical engineer.

B. Unsatisfactory Soil Materials: Unsatisfactory soil materials are defined as those complying with ASTM D 2487 soil classification groups OL, OH, and PT, as well as those soil materials deemed unsuitable by the geotechnical engineer.

C. Topsoil: Topsoil material shall be free from organic material, rock or gravel 1/2" and larger in any dimension, debris, waste, frozen material, vegetable and other deleterious matter; furthermore, topsoil shall be capable of supporting a good growth of grass. Please see Section 32 91 19 - Topsoil Placement and Grading for any additional requirements and specifications for topsoil to be placed within the project.

D. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
   1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp (103-kW) flywheel power with bucket-curling force of not less than 28,090 lbf (125 kN) and stick-crowd force of not less than 18,650 lbf (83 kN); measured according to SAE J-1179.
   2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp (157-kW) flywheel power and developing a minimum of 48,510-lbf (216-kN) breakout force with a general-purpose bare bucket; measured according to SAE J-732.

E. Borrow: Material for use in replacing undercut areas or in construction of embankments shall be approved by the Geotechnical Engineer and obtained from approved sources.

F. Porous Fill: For areas under on-grade slabs or where otherwise called for on plans and details, use clean, washed gravel or crushed stone which is free of clay, vegetable matter, loam or other deleterious matter; material shall be VDOT #57 stone unless otherwise indicated.

G. Filter Fabric: Geotextile filter fabric shall be a nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester, formed into a stable network by needle punching. The fabric shall be inert to commonly encountered chemicals, hydrocarbons, mildew and rot resistant, resistant to ultraviolet light exposure, insect and rodent resistant, and conform to the properties in the following table. The minimum average roll value (weakest principal direction) for strength properties of any individual roll tested from the manufacturing lot or lots of a particular shipment shall be in excess of the minimum average roll value (weakest principal direction) stipulated herein.
1. Test Requirements: Filter fabric shall meet or exceed the following values when tested in accordance with the test method specified.

<table>
<thead>
<tr>
<th>Physical Property</th>
<th>Test Method</th>
<th>Minimum Average Roll Value (Weakest Principal Direction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>ASTM D1777</td>
<td>75 (mil)</td>
</tr>
<tr>
<td>Grab Tensile Strength</td>
<td>ASTM D4632</td>
<td>100 (pounds)</td>
</tr>
<tr>
<td>Elongation at Failure</td>
<td>ASTM D4632</td>
<td>50 (percent)</td>
</tr>
<tr>
<td>Coefficient of Normal Permeability</td>
<td>(cm/sec)</td>
<td>0.1</td>
</tr>
<tr>
<td>Vertical Water Flow</td>
<td>ASTM D4491</td>
<td>100 (gpm/ft²)</td>
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<tr>
<td>Apparent Opening Size</td>
<td>ASTM D4751</td>
<td>70 (mm)</td>
</tr>
<tr>
<td>Puncture Strength</td>
<td>ASTM D4833</td>
<td>80 (pounds)</td>
</tr>
</tbody>
</table>

**PART 3 EXECUTION**

**3.01 TOPSOIL**

A. Conservation of Topsoil: Topsoil shall be removed as required without contamination with subsoil and stockpiled convenient to areas for later application or at locations specified. Any surplus of topsoil from excavations and grading shall be stockpiled in location approved by the Owner. A silt fence shall be installed on the downslope side and the stockpiles seeded.

B. Placing Topsoil: Refer to Section 32 91 19 - Topsoil Placement and Grading for specifications regarding the preparation for and placement of topsoil within the project. All areas disturbed by work in this project shall be seeded in accordance with Section 32 92 19 - Seeding.

**3.02 EXCAVATION**

A. Excavation: Excavation shall be unclassified. After topsoil removal has been completed, excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated. Satisfactory excavation material shall be transported to and placed in fill areas within the limits of the work. Excavations carried below the depths indicated, shall, except as otherwise specified, be
refilled to the proper grade with satisfactory material as directed. All additional work of this nature, unless directed by Owner or Owner’s agents for the purposes of under-cutting below subgrade, shall be at the Contractor's expense; where under-cutting below subgrade is directed, it shall be compensated in accordance with the proposal form. Excavation and filling shall be performed in a manner and sequence that will provide drainage at all times. Excavations shall be kept free from water while construction therein is in progress. If the Contractor fails to provide adequate drainage and any material becomes soft or otherwise unsuitable as a result, such material shall be re-moved and replaced with satisfactory on-site material or borrow material from approved sources, or shall be dried and recompacted as directed by the Geotechnical Engineer at no additional cost to the Owner. Fill areas and slopes may, in some instances, be adjusted to balance earthwork quantities as approved by the Architect/Engineer. Material required for fills in excess of that produced by excavation within the grading limit shall be obtained from borrow areas at the Contractor's expense.

1. Rock Undercut: Rock occurring within 12 inches below the subgrade elevation shall be undercut and replaced. The undercut area shall be brought up to subgrade with approved material placed and compacted in accordance with these specifications and the under the observation of the geotechnical engineer. Other applicable specifications are listed in VDOT 303 concerning under-cutting rock. When required, the under-cutting of rock beyond the subgrade elevations and the corresponding backfill will be paid for as provided for under the unit prices established on the bid form for the removal of unsuitable materials and backfill corresponding thereto; measurement of the volumes for these unit-price items will be performed by the geotechnical engineer.

2. Unless specific “waste areas” have been designated on the site plan, all unsuitable and surplus material shall be disposed of off-site in accordance with Section 31 10 00 – Site Clearing.

B. Excavation for Structures: Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

C. Trench Excavation for Utilities: Trenches for underground utilities systems and drain lines shall be in accordance with Section 31 2333 - Trenching and Backfilling.

D. Ditches, Gutters, and Channel Changes: Ditches, gutters, and channel changes shall be cut accurately to the cross sections and grades indicated. All roots, stumps, rock, and foreign matter in the sides and bot-tom of ditches, gutters, and channel changes shall be trimmed and dressed or removed to conform to the slope, grade, and shape of the section indicated. Care shall be taken not to excavate ditches and gutters below the grades indicated. Excessive ditch and gutter excavation shall be backfilled to grade either with compacted to specified densities material or with suitable stone or cobble to form an adequate gutter paving as directed. All ditches and gutters excavated under this section shall be maintained until final acceptance of the work. Satisfactory material excavated from ditches and channel changes shall be placed in fill areas. Unsuitable and excess excavated material shall be disposed of in designated waste areas or as directed.

E. Dewatering:
1. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.

2. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

3. Effluent from dewatering shall be filtered or passed through a sediment-trapping device before leaving the site or entering the storm sewer system.

4. Convey water removed from excavations and rain water to collecting or run-off areas. Establish and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.

F. Stability of Excavations: Maintain sides and slopes of excavations in a manner such that the excavation provides safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.

3.03 GRADING

A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Finish surfaces free from irregular surface changes, and as follows:
   1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 1 inch above or below required subgrade elevations.

C. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

D. Topsoil: After grading, apply topsoil in areas to receive permanent seeding in accordance with Section 32 91 19 - Topsoil Placement and Grading. Remaining topsoil shall be stockpiled where shown or directed for future use.

E. Protection of Graded Areas:
   1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
   2. Repair and re-establish grades in settled, eroded and rutted areas to specified tolerances.

F. Fine Grading: Grade site to finished grade as indicated by contours, elevations, and details. Protect site from traffic and weather until permanently stabilized with turf or landscaping.

3.04 FILL

A. General: Fill required to bring the site to the grades indicated shall be controlled fill as herein specified.

B. Preparation of Ground Surface for Fill:
   1. All vegetation such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetative matter, rubbish, and other unsatisfactory material within the area upon which fill is to be placed, shall be stripped or otherwise removed before the fill is started. In no case will unsatisfactory material remain in or under the fill area.
   2. The areas shall then be scarified to a depth of at least 6 inches, moistened or aerated as required and compacted with vibratory rollers, pneumatic rollers, sheepsfoot rollers or
other mechanical means acceptable to the Geotechnical Engineer. When existing round surface has a density less than that specified under "Compaction" for particular area classification, break up ground sur-face, pulverize, moisture-condition to optimum moisture content, and compact to required per-centage of maximum dry density, at the direction of the Geotechnical Engineer.

3. Prior to placement of any fill, proofroll the area upon which fill material is to be placed with a loaded tandem-axle dump truck with a minimum weight of 15 tons. Make a minimum of two passes at right angles to each other or otherwise test the area to receive fill as directed by the Geotechnical Engineer. Undercut areas which exhibit undesirable characteristics, in the opinion of the Geotechnical Engineer, and replace with controlled fill prior to placing any additional lifts on the area.

4. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be plowed, stepped, benched, or broken up, as directed, in such manner that the fill material will bond with the existing surface.

5. Prepared surfaces on which compacted fill is to be placed shall be wetted or dried as may be re-quired to obtain the specified moisture content and density.

C. Fills and Embankments:

1. Fills and embankments shall be constructed at the locations and to lines and grades indicated. The completed fill shall conform to the grading plan indicated.

2. Approved material obtained during excavation may be used in forming required fill. Fill shall be satisfactory material as defined herein.

3. The material shall be placed across the full width of the cross section in successive horizontal lay-ers of 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Each layer shall be compacted as specified herein before the overlying lift is placed.

4. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or sub-sequent to compaction operations.
   a. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
   b. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

5. At the end of each day's filling operation, grade fill areas to drain and seal the top of all new con-trolled fill by compacting with a steel drum roller.

3.05 ROCK FILL PLACEMENT

A. General: Rock fills shall be dumped on top of previous layers and spread some distance across the pre-vious layer in a uniform layer / lift parallel with the top of the earthwork; do not dump rock fill material in place and attempt to compact in place. It is critical that rock fills be spread after being dumped, as this process helps compaction to occur. For uniformity, mix soil, rock spall and rock dust with large rock. The best material is to be reserved for finishing and dressing the surface of the rock fill.

B. Testing: The amount of rock present in a rock fill that will preclude conducting density tests shall remain flexible and shall be at the discretion of the Geotechnical Engineer. If it is
possible to conduct a density test, then a test shall be performed per testing requirements outlined elsewhere in this section.

C. Layering:
1. General limitation: Excavated / blasted rock fill material should not be used for fill within 5 feet of footing, grade-slab, or pavement subgrades. The upper 5 feet of fill under the proposed building elements should consist of a soil fill to provide a more uniform bearing surface and for ease of excavation.
2. 10 feet and deeper, below top of rock fill:
   a. Maximum rock size = 4 feet in its greatest dimension
   b. Maximum lift thickness = maximum rock size (no greater than 4’)
3. 2’-10’ below top of rock fill:
   a. Maximum rock size = 2 feet in its greatest dimension
   b. Maximum lift thickness = maximum rock size (no greater than 2’)
4. 1’- 2’ below top of rock fill:
   a. Maximum rock size = 6 inches in its greatest dimension
   b. Maximum lift thickness = 8” loose, 6” compacted depth
5. 0’ – 1’ below top of rock fill:
   a. Maximum rock size = 3 inches in its greatest dimension
   b. Maximum lift thickness = 8” loose, 6” compacted depth

3.06 COMPACTION
A. Subgrade Compaction: Subgrade shall be prepared for compaction as follows:
   1. The subgrade under the building shall be proofrolled with a pneumatic tired device weighing at least 20 tons to locate soft or other unsuitable areas. The number and direction of passes shall be as required by the Geotechnical Engineer. Any unsuitable material which is encountered shall be removed and replaced as required by the Geotechnical Engineer and as specified herein. Do not proof-roll wet or saturated subgrades.
   2. The cut subgrade material shall be compacted to 95% of its maximum dry density as determined by ASTM D698. The moisture content should be within +/-3 percentage points of the material’s optimum as determined by ASTM D2216.
B. Compaction: Each layer of the fill shall be compacted to the maximum theoretical density, as specified below, as determined by ASTM D698. Moisture content shall be within +/-3 percent of optimum as determined by ASTM D2216. Project areas referred to below are taken from the areas designated on the grading plan sheets and the Grading Schedule on those sheets.
   1. Under foundations, future building slabs, sidewalks, and pavements, and in pond embankments, compact each layer to 95% of maximum dry density.
   2. Under lawns or unpaved areas, compact each layer to 85% of maximum dry density.

3.07 FINISHED GRADES
A. General: All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations, except as otherwise specified. Ditches and gutters shall be finished to permit adequate drainage.
B. Unsatisfactory Material: Soft or otherwise unsatisfactory material shall be replaced with satisfactory excavated material or other approved materials.
C. Finished Elevations: Low areas resulting from removal of unsuitable material or from excavation of rock shall be brought up to required grade with satisfactory materials, and the entire area shall be shaped to line, grade, and cross section and shall be compacted as specified. The surface of embankments or excavated areas for road construction or other areas on which a base course or pavement is to be placed shall vary not more than 0.10 feet from the established grade and approved cross section. Surfaces other than those to be paved shall be finished not more than 0.20 feet above or below the established grade or approved cross section. However, in all cases, surfaces shall be finished to provide positive drainage away from buildings.

D. Rims, Covers, & Lids: All tops of utility meters, manholes, valves, etc. shall be adjusted to be flush with adjacent finished grades within the area of work. Contractor is responsible for adjusting utility rims to finished grades at no additional cost to owner.

3.08 PROTECTION

A. Site Preservation: The Contractor shall protect newly graded areas from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades reestablished to the required elevations and slopes. All work shall be conducted in accordance with the Erosion Control provisions of these specifications.

B. Seeding: All areas disturbed by work in this project shall be seeded in accordance with Section 329219 - Seeding.

3.09 FIELD QUALITY CONTROL

A. A. Testing: Testing shall be the responsibility of the Owner, and shall be performed by an approved independent testing laboratory qualified to perform such tests and approved by Architect/Engineer. Field Density tests conforming to ASTM D698 (Standard Proctor), shall be made by the Geotechnical Engineer or his representative on each soil type found in the areas prepared to receive fill and in the soil to be used for fill. Field Density tests shall be made by the Geotechnical Engineer or his representative in accordance with ASTM D1556 or ASTM D2922 and ASTM D3017 on the areas prepared to receive fill and on each layer of compacted fill. When ASTM D2922 is used, the calibration curves shall be checked and adjusted if necessary by the procedure described in ASTM D2922, paragraph “ADJUSTING CALIBRATION CURVE”. ASTM D2922 results in a wet unit weight of soil and when using this method, ASTM D3017 shall be used to determine the moisture gauges along with density calibration checks as described in ASTM D3017. ASTM D 2937 shall be used only for soft, fine-grained, cohesive soils. At least one test shall be performed on the compacted backfill. More tests shall be performed if in the judgment of the Representative, Geotechnical Engineer, or Architect/Engineer the compactive effort of the Contractor will not result in the specified density. In addition to visual inspection of all subgrade and excavations, the Geotechnical Engineer shall be present onsite for visual observation and inspection during all controlled fill operations; it will be the Contract’s responsibility to coordinate in advance with the Geotechnical Engineer so as to have proper observation during filing operations.

B. Testing Frequency: The following submittals are required.
   1. A minimum of one moisture-density test shall be performed for each classification of fill material, and existing subgrade material.
   2. One Atterberg limits test and one gradation analysis is required for every lab density test.
3. Field density tests shall be performed as follows: The Geotechnical Engineer shall direct the number and location of test performed. Unless otherwise directed by the Geotechnical Engineer, perform not less than one field density test for every 2,500 sq. ft. of area, and in no case fewer than four tests no further apart than 50 feet. In utility trenches, perform one test per 50 linear feet of trench.

C. Visual Inspection: Upon completion of all excavation of unsuitable material, and for all footings, the Geotechnical Engineer shall visually inspect the subgrade and excavations. The visual inspection shall be conducted to assure that the data obtained from the test borings and used as a basis of design was representative of the site conditions. Upon completion of the inspection, the Geotechnical Engineer shall provide written notification to the Owner and Architect/Engineer.

D. Proof Rolling: Following visual inspection, Contractor shall demonstrate to the Geotechnical Engineer that the exposed subgrade does not contain previously unidentified soft areas by proof rolling. Proof rolling shall consist of the Contractor rolling the entire surface with approved mechanical equipment while the Geotechnical Engineer observes the subgrade for displacement or deformation.

E. Quantification of Rock Excavation: Except in the case of undercutting below subgrade as directed by the Geotechnical Engineer, the quantification of rock shall not be required as all excavation is unclassified.

3.10 CERTIFICATIONS

A. Post Construction Survey: Following substantial completion of all grading operations, Contractor shall be responsible for having a post construction topographic survey performed of the complete project area.

1. Topographic survey: Surveying services provided shall be performed in compliance with the Virginia Department of Professional and Occupational Regulation’s “Minimum Standards and Procedures for Surveys Determining Topography” and to a standard of care consistent with members of the surveying profession practicing in this locale at this time and date.

B. Elevation Certification: Contractor shall be required to provide certification of grading elevations. Certifications shall be prepared or verified by a registered civil engineer or land surveyor and shall certify that the general grading has been completed and that the resulting grade elevations are in substantial conformity (not exceeding one-tenth of a foot) with the site grading plan.

3.11 DISPOSAL OF WASTE MATERIALS

A. Remove waste materials, including trash and debris and dispose of off Owner's property.

B. Transport acceptable excess excavated material, including excess topsoil, to designated areas as directed by Architect/Engineer.

END OF SECTION 31.00.00
SECTION 31.10.00
SITE CLEARING

PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Work Included: Work shall be completed as described in this section and shall include the furnishing of all labor, material, equipment, and appurtenances to remove all tree stumps, trees, limbs, sod, topsoil, and rubbish from construction area and dispose of said material in an approved location. Stockpile topsoil in an approved area for later use during final grading and restoration. Furnish all labor materials, supplies, and equipment necessary to provide erosion and sediment control during construction of the facilities.

   B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
      1. Section 32.91.19 – Topsoil Placement and Grading.
      2. Section 32.92.19 – Seeding.

1.02  DEFINITIONS
   A. Clearing: Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including down timber, snags, brush, and rubbish occurring in the areas to be cleared.

   B. Grubbing: Grubbing shall consist of the removal and disposal of brush, stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas.

   C. Usable Topsoil: Topsoil to be stockpiled for restoration shall consist of friable clay loam, free from roots, stones, and other undesirable material and shall be capable of supporting a good growth of grass.

   D. Large Trees: Trees, limbs, and other timber having a diameter of 3 inches and greater.

   E. Brush: Brush, tree tops, and material having a diameter less than 3 inches.

1.03  REFERENCES
   A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

   B. American Society for Testing and Materials (ASTM):
      1. D448: Standard Classification for Sizes of Aggregate for Road and Bridge Construction

   C. Virginia Department of Transportation - Road and Bridge Specifications (VDOT):
      1. 106: Control of Material

1.04  SUBMITTALS
   A. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1.05  PROJECT CONDITIONS
   A. Site Protection:
      1. Provide protection as necessary to prevent damage to existing site improvements or vegetation to remain in place as indicated on the plans.
2. Protect improvements on adjoining properties and on Owner’s property.
3. Restore damaged improvements to their original condition, as acceptable to parties having jurisdiction in accordance with Section 32 20 00 – Site Restoration.

B. Traffic:
1. Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.

C. Permits:
1. Contractor shall be responsible for obtaining all necessary permits from authorities having jurisdiction prior to the start of site clearing and corresponding erosion control work.
2. Contractor shall be responsible for coordination of and attendance at all necessary pre-construction meetings with Owner and permitting authorities.

1.06 QUALITY ASSURANCE
A. Coordination: Coordinate clearing operations with Owner to limit clearing of work areas.

PART 2 PRODUCTS

2.01 EROSION AND SEDIMENT CONTROL
A. All Erosion and Sediment Control work required corresponding to the site clearing shall be in accordance with the Erosion and Sediment Control Specifications (Section 31 25 13) for this project.

B. Barriers:
1. Straw Bale Barriers: Straw bale barriers shall be placed in a single row, lengthwise, along the contour and embedded in the soil to a depth of three inches at locations shown on the plans and as directed by the Engineer or other agency having jurisdiction during completion of the work. Bales must be securely anchored in place by stakes or re-bars to prevent displacement. Barriers shall be inspected frequently. Repair or replacement must be made promptly if needed. Refer to the Standard Detail titled Straw Bale Barrier.
2. Silt Fences: Silt fence barriers shall be constructed by setting 1 inch x 2 inches x 3 feet stakes and excavating a 4 inches x 4 inches trench along the line of stakes. Staple silt fence to stakes and extend into trench. Backfill and compact excavated soil, anchoring silt fence. Refer to the Standard Detail titled Silt Fence.

C. Gravel Outlet Structures: Gravel outlet structures shall be constructed of ASTM D448 #2 stone or its equivalent. The bases and side slopes of the gravel shall be placed so as to conform to the dike configuration. The invert of the outlet shall be not less than six inches lower than the top of the adjoining earth dike, and the gravel shall extend to the top of the dike. Discharge from the outlet structure shall be onto an already stabilized area or watercourse. The gravel outlet structure shall be inspected for silt accumulation after each runoff-producing rain. If structure ceases to function properly due to silt accumulation, the silt shall be removed and the gravel shall be replaced.

D. Temporary Interceptor Dikes: Temporary interceptor dikes shall be machine compacted and have a positive grade draining to the gravel outlet structure. Periodic inspection and maintenance of the dike shall be provided to insure proper functioning of the dike.
E. Construction Entrance/Exit: Adequate stone shall be applied prior to and during construction to control dust, erosion, siltation, tracking of mud onto public roads, and to maintain normal traffic.

F. Permanent Measures: Permanent erosion and sediment control shall be in accordance with this section and Section 32 92 19 – Seeding. Schedule excavation, fill, finish grading, and seeding work in such a manner as to minimize exposure to erosive forces.

PART 3 EXECUTION

3.01 CLEARING AND GRUBBING

A. Staking:
   1. Areas to be cleared shall be staked on the ground by the Contractor and approved by the Owner before clearing operations are begun. Contractor shall obtain services of a licensed Engineer or Land Surveyor for purposes of facilities layout. Locations to be field staked by the Contractor and approved by Owner's Representative or Engineer prior to any construction.

B. Protection of Trees:
   1. Owner shall mark any trees within the limits of clearing, 4 inches in diameter or greater, which are desired to be saved for landscaping purposes. Contractor shall take whatever measures deemed necessary to protect marked trees throughout the duration of construction.

C. Clearing:
   1. All trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated on the plans to be left standing. Trees designated to be left standing within the more cleared areas shall be trimmed of dead branches 1-1/2 inches or more in diameter or as directed by the Owner. Limbs and branches to be trimmed shall be neatly cut close to the trunk of the tree or main branches. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

D. Grubbing:
   1. Material to be grubbed, together with logs and other organic debris not suitable for foundation purposes, shall be removed to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this Contract, such as areas buildings, and areas to be paved. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground.

3.02 DISPOSAL OF MATERIALS

A. Disposal:
   1. Carry out disposal of debris and unsuitable or surplus material in accordance with the VDOT 106. In all cases, the Contractor shall be responsible for obtaining a suitable disposal site.

B. Trees:
   1. All felled timber from which saw logs, pulpwod, posts, poles, ties, mine props, or cordwood can be produced shall be considered salable timber, and shall be trimmed of limbs and tops, sawed into salable lengths and removed from the site by the Contractor.
C. Burning or Removing from Site:
   1. Logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations shall not be burned on site. Permission to dispose of such products on private property shall be in writing, and a copy of this permit shall be filed with the Owner.

3.03 DRAINAGE
   A. General: The Contractor shall be responsible for proper drainage of the site during construction of the project. Water shall not be allowed to accumulate in any of the excavated areas. Storm or ground water collecting on the site during construction shall be removed by pumping, ditching or other suitable means.

3.04 STOCKPILING
   A. Topsoil: Topsoil shall be stripped from all excavation and fill areas and stockpiled in an approved area until needed for finish grading. Stockpiles shall be seeded within 10 days of construction. Silt fence shall also be maintained around the stockpiles until mature vegetation is established on the stockpile.
   B. Spreading of Topsoil: The spreading of topsoil shall be in accordance with Section 32.91.19 – Topsoil Placement and Grading in these specifications.
   C. Mulch: Chipped brush to be used in the project as landscaping mulch shall be stockpiled in an approved area until needed. Stockpile shall be maintained to prevent contamination of the material.

END OF SECTION 31.10.00
SECTION 31.23.33
TRENCHING AND BACKFILLING

PART 1 GENERAL

1.01 DESCRIPTION
A. Work Included: Excavation and preparation of trenches as shown on the plans and specified herein, backfilling and site restoration.
B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 01.55.26 – Traffic Control
   2. Section 31.10.00 - Site Clearing
   3. Section 31.00.00 – Earthwork
   4. Section 32.10.00 – Bases, Ballasts, and Paving
   5. Section 32.92.19 – Seeding

1.02 REFERENCES
A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
B. American Society for Testing and Materials Publications (ASTM):
   1. D448: Standard Classification for Sizes of Aggregate for Road and Bridge Construction
   2. D698: Test Method for Laboratory Compaction Characteristics of Soils Using Standard Effort (12,400 ft-lbf/ft³)
   3. D1556: Standard Test Method for Density and Unit Weight of Soil In Place by the Sand-Cone Method
   4. D1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³)(2,700kN-m/m³)
   5. D2167: Standard Test Method for Density and Unit Weight of Soil In Place by the Rubber Balloon Method
   6. D2487: Standard Classification of Soils for Engineering Purposes (unified Soil Classification System)
   7. D2922: Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
C. Virginia Department of Labor and Industry - Occupational Safety and Health Standards for the Construction Industry.
   1. Subpart P: Excavations, Trenching, and Shoring
   2. Subpart U: Blasting and the Use of Explosives

1.03 DEFINITIONS
A. By Reference: All definitions identified in Section 31.00.00 – Earthwork shall be incorporated herein by reference.
B. Unyielding Material: Unyielding material shall consist of rock and gravelly soils with stones greater than 18 inches in any dimension.
C. Unstable Material: Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.
D. Select Granular Material: Select granular material shall consist of well-graded sand, gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall not contain more than 10 percent by weight of material passing a No. 200 mesh sieve. The maximum allowable aggregate size shall be 1 inch, or the maximum size recommended by the pipe manufacturer, whichever is smaller.

E. Initial Backfill Material: Initial backfill material shall consist of select granular material or satisfactory materials free from rocks 1 inch or larger in any dimension.

1.04 QUALITY ASSURANCE

A. Testing Results: Copies of all laboratory and field test reports shall be submitted to the Engineer within 72 hours of the completion of the test.

PART 2 PRODUCTS

2.01 PLASTIC MARKING TAPE

A. General: Plastic marking tape shall be acid and alkali-resistant polyethylene film, 2 inches wide with minimum thickness of 0.004 inches. Tape shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in Table 1 and shall bear a continuous printed inscription describing the specific utility.

<table>
<thead>
<tr>
<th>Tape Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red:</td>
<td>Electric</td>
</tr>
<tr>
<td>Yellow:</td>
<td>Gas, Oil, Dangerous Materials</td>
</tr>
<tr>
<td>Orange:</td>
<td>Telephone, Telegraph, Television, Police, and Fire Communications</td>
</tr>
<tr>
<td>Blue:</td>
<td>Water Systems</td>
</tr>
<tr>
<td>Green:</td>
<td>Sewer Systems (including sewer force main)</td>
</tr>
</tbody>
</table>

PART 3 EXECUTION

3.01 GENERAL

A. A. Classification: Refer to the Specification Section 31.00.00 Earthwork.

B. Clearing

1. General: Only that portion of the work area actually needed for construction shall be cleared unless directed otherwise by the Engineer. In no case shall clearing or debris from
clearing operations be taken past rights-of-way lines or designated work areas. Areas disturbed by construction operations shall be protected from erosion by suitable methods outlined in the Virginia Erosion and Sediment Control Handbook.

3.02 EXCAVATION AND PREPARATION OF TRENCH

A. Depth: Depth of trenches shall be as shown on plans and cut sheets except that the trench shall be excavated to allow for a depth of 1/4 of the pipe's outside diameter or a minimum of 4 inches of ASTM D448 #68 aggregate bedding (or as shown on the plans) in earth and 6 inches of aggregate bedding in rock for gravity sewer.

B. Width: Width shall be sufficient to allow pipe installation without walking or standing on pipe. The trench width at a point 12 inches above the top of the pipe shall not be less than 6 inches and not more than 12 inches on each side of the pipe's largest diameter unless otherwise directed by the Engineer.

C. Unsuitable Material: Wet or otherwise unsuitable soil at the subgrade shall be removed and replaced with compacted ASTM D448 #357 stone to the bottom of the normal trench bedding; such undercutting, when authorized, shall be compensated in accordance with the proposal form. Excess or unsuitable materials shall be disposed of by the Contractor on the project site where directed and approved by the Owner.

D. Rock Excavation: Ledge rock, boulders, and large stones shall be removed to provide a clearance of at least 6 inches below and on each side of all pipe, manholes, valves or other appurtenances and overdepth shall be backfilled with satisfactory material and compacted in conformance with BACKFILLING subsection. When required, the undercutting of rock beyond the require trench cut-lines and the corresponding backfill will be paid for as provided for under the unit prices established on the bid form for the removal of unsuitable materials and backfill corresponding thereto.

E. Topsoil: Topsoil shall be stripped from excavation area and stockpiled in approved area until needed for finish backfill and grading.

F. Trench Protection: The Contractor shall furnish and erect such sheathing, bracing and shoring, and shall furnish necessary signs, barricades and temporary lighting as may be pertinent for the protection of his work, employees, the public, adjacent structures, and to guard against contingencies which might give rise to delays in the work. Sheathing left in place shall be at the Contractor's expense. Where trench wall sloping is necessary for safety or other reasons, the Engineer shall be notified to determine if additional strength pipe will be required. Responsibility for preservation of trench banks and other excavated spaces and the prevention of injury to any persons or property shall rest entirely with the Contractor. A maximum of 200 feet of trench for each crew will be allowed open at any one time. Trench construction and safety shall be governed by the Occupational Safety and Health Standards for the Construction Industry, Subpart P.

G. Pumping, Bailing, and Draining: The Contractor shall remove any water which may accumulate or be found in the trenches or other excavations and shall keep the excavations clear of water while work is being installed, unless approval to the contrary is granted by the Engineer.

H. Blasting: Blasting when permitted shall be in accordance with Section 31 00 00 – Earthwork.

I. Cleated Equipment: No cleated equipment shall be used on pavements. Road drainage shall not be clogged, and shoulders, ditches, roadside drainage facilities and pavement affected by trenching operations shall be maintained in a condition satisfactory to the Owner. Entrances
shall not be blocked except for short periods as arranged with the owner, and ingress and egress to adjacent property shall be maintained at all times.

3.03 WORK WITHIN ROAD RIGHTS-OF-WAY

A. Traffic Control: Typical traffic control for utility work on road rights-of-way shall comply with VDOT Work Area Protection Manual traffic control details.

B. Traffic Routing: Traffic shall not be blocked or re-routed without permission from the Owner and VDOT (or the Town / City having jurisdiction over right-of-way). Where one way traffic is permitted to be maintained, it shall be flagged 24 hours per day. Traffic shall at all times be properly protected by adequate lights, barricades and signs, and also flagmen when needed. Traffic control shall be provided in accordance with Section 01 55 26.

C. Erosion and Siltation Control: At all locations straw barriers, silt fence, silt settlement basins, brush barriers or other measures are to be utilized in prevention of erosion and siltation.

D. Trenches: No trench within VDOT (or the Town / City having jurisdiction over right-of-way) rights-of-way can remain open overnight.

E. Roadway Crossings: When roadway pavement must be open cut for the installation of a utility, all work is to be performed in strict compliance with the procedures and work results spelled out in VDOT’s Special Provisions for Pavement Open Cuts (VDOT Document LUP-OC) unless more stringent requirements are imposed by the Town / City having jurisdiction over right-of-way. In VDOT rights-of-way cutting of pavement or open cutting ditches for utility installation shall be requested via the “Request for Pavement Open Cut” form (VDOT LUP-OC) and shall then be approved in writing by that agency prior to any work; Contractor shall be responsible for any bonding of such work.

3.04 WASTE AREAS

A. General: Unless specific “waste areas” have been designated on the site plan, all unsuitable and surplus material shall be disposed of off-site in accordance with Section 31 10 00 – Site Clearing.

3.05 COORDINATION

A. General: The Contractor shall notify the Owner in advance of commencing work and in the event of the necessity of disrupting utility or other services to such property, he shall notify the Owner or responsible person in charge of such utility or other services and arrange for the disruption and restoration of such service in a manner which will result in a minimum of inconvenience to parties concerned.

3.06 BACKFILLING

A. Materials: All backfill materials shall be free from mud, refuse, construction debris, organic material, boulders, frozen or otherwise unsuitable material. Initial backfill shall be as defined in this section. Remaining backfill may contain stones up to 3 inches in their greatest dimension, unless otherwise specified. The Contractor may backfill with the excavated material, provided it meets the conditions as stated above.

B. Gravity Sewer Bedding: Unless superseded by a more stringent standard of the local authority or jurisdiction, all bedding shall be required on all gravity sewer lines and shall be in accordance with applicable VDOT Standards (VDOT Road and Bridge Standards, latest edition), including the VDOT Standard UB-1 Type 3 detail, PB-1 standard, and PC-1 standard.

C. Pressure Pipe Bedding: Unless superseded by a more stringent standard of the local authority or jurisdiction, all bedding shall be required on all pressure pipe installations and shall be in
accordance with applicable VDOT Standards (VDOT Road and Bridge Standards, latest edition), including the VDOT Standard UB-1 Type 2 detail.

D. Trench Backfilling and Compaction: Backfill and the compaction thereof of utility trenches shall be in accordance with requirements for Controlled Fill as specified in Section 31 00 00 – Earthwork for each area classification including size (thickness) of lifts, compacted density requirements, frequency of tests, etc.

1. In Uncontrolled Areas: Initial backfill shall be with select material to a depth of at least one foot over the pipe and compacted prior to placement of remaining backfill. Initial backfill shall be placed in lifts not to exceed 6 inches (prior to compaction). Remaining backfilling shall be carried up evenly in lifts not to exceed 12 inches (loose). Backfill in trenches outside of proposed pavement areas or street rights-of-way, or in other areas when allowed by the Engineer, shall be compacted in accordance with compaction requirements established in Section 31 00 00 – Earthwork. Care shall be taken to prevent damage to pipe or other structures during compaction. Damage to pipelines or other structures resulting from compaction shall be corrected by the Contractor without expense to the Owner.

2. In Controlled Areas: Backfill under pavement, proposed pavement, or in areas within rights-of-way shall be in layers of selected earth not more than 6 inches in thickness, and each layer shall be compacted in accordance with compaction requirements established in Section 31 00 00 – Earthwork.

3. In Embankments: Backfill of culverts, collars, cradles, and storm structures used as a part of an outlet structure for a stormwater management facility shall be treated like other Controlled Fill areas such as below buildings or pavements; it prepared, placed, compacted, and tested in a manner consistent with compaction requirements for such Controlled Areas as established in Section 31 00 00 – Earthwork.

E. Marking of Pipelines: Marking of pipelines shall be required for all utility pipelines, using a metallic marking tape. The marking tape shall be installed along the entire length of the pipe line.

F. Backfill Testing: Testing of utility trench backfill compaction shall be in accordance with requirements for Controlled Fill as specified in Section 31 00 00 – Earthwork for each area classification including size (thickness) of lifts, compacted density requirements, frequency of tests, etc. The test shall be repeated until satisfactory results are obtained. In addition to visual inspection of all subgrade and excavations, the Geotechnical Engineer shall be present onsite for visual observation and inspection during all backfilling operations; it will be the Contractor’s responsibility to coordinate in advance with the Geotechnical Engineer so as to have proper observation during backfilling operations.

1. Normal Testing Frequency: The Geotechnical Engineer shall direct the number and location of tests performed. Unless otherwise directed by the Geotechnical Engineer, perform not less than one field density test for every 2,500 sq. ft. of area, and in no case fewer than four tests no further apart than 50 feet. In utility trenches, perform one test per 50 linear feet of trench.

2. Expanded Testing Requirements: If normal testing within a test section indicated unacceptable backfill, the Engineer or Owner may require additional testing within the same test section to determine the limits of unacceptable backfill. Additional testing required by the Owner’s representative shall not exceed testing of 4 additional locations within the test section. Unacceptable backfill within the limits established by the testing shall be removed and replaced by the Contractor at no additional cost to the Owner.
Additional testing beyond that required may be performed by the Contractor at his expense to further delineate limits of unacceptable backfill.

3. Additional Testing: Testing beyond the normal frequency or expanded testing required which is requested by the Engineer or Owner, and approved by the Owner, shall be at the Owner's expense.

G. Finished Surfaces: Uniformly smooth grading of disturbed areas shall be required after backfill and compaction. Ditches and gutters shall be finished to drain readily. In grass or lawn areas, the last 4 inches of compacted fill will consist of topsoil or an approved soil which will support a turf growth after fertilizing and seeding. Settlement or other damage that occurs prior to acceptance of this work shall be repaired and grades satisfactorily re-established.

H. Quality Assurance: The Contractor will be responsible for and shall repair any settlement in the backfill or pavement for a period of one year after completion of the work.

3.07 SITE RESTORATION

A. General: Upon completion of utility installation, contractor shall return site to former state according to Section 32 20 00 – Site Restoration.

B. Drainage Improvements: The Contractor shall restore and/or repair all drainage ways and swales including paved or concrete channels as part of this work to a condition equal to that before the work began. Damaged drainage facilities shall be replaced. Restored ditches and swales shall provide positive drainage from roadways. Drainage restoration within VDOT rights-of-way shall be to the satisfaction of the Virginia Department of Transportation.

C. Cleanup: The Contractor shall at all times keep the site cleaned to the satisfaction of the Owner’s representative. In all cases, he shall "broom" the surfaces of paved streets immediately following backfilling. All surplus materials shall be removed and disposed of from the site of the work unless directed otherwise by the Engineer. Where material is placed on pavement, a layer of stone dust or sand shall be applied first to facilitate clean-up.

END OF SECTION 31.23.33
SECTION 31.25.13
EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. A. Section Includes: Contractor shall furnish all labor, materials, supplies, equipment, and appurtenances necessary for the complete and satisfactory construction and maintenance of the erosion control measures shown on the plans and indicated in the Erosion and Sediment Control Narrative for the project. Properties and natural waterways adjacent to the site of land disturbance shall be protected from sedimentation by the use of the erosion control and storm water drainage measures shown on the plans and as may be deemed necessary by the Engineer during construction.

B. Related Sections:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 33.40.00 – Storm Drainage Utilities
   3. Section 32.91.19 – Topsoil Placement and Grading
   4. Section 32.92.19 – Seeding

1.02 TEMPORARY MEASURES

A. General: Temporary erosion and sediment control shall be achieved by using the following measures where indicated on the plans or as required for erosion control: Straw bale barriers, temporary interceptor dikes, gravel outlet structures, and silt fence barrier. Said measures shall be constructed and made workable prior to beginning site excavation and grading work.

1.03 PERMANENT MEASURES

A. General: Permanent erosion and sediment control shall be achieved by seeding and drainage structures as detailed in Sections 33 40 00 – Storm Drainage Utilities, 32 92 19 – Seeding, 32 91 19 – Topsoil Placement and Grading of these specifications. The Contractor shall schedule excavation, fill, finish grading, and seeding work in such a manner as to minimize exposure to erosive forces. Seeding of exposed areas shall commence as soon as possible after excavating, backfilling, grading, or other operations have been completed and shall be maintained until an acceptable stand of turf has been developed. Slope protection shall be installed as soon as the grading is complete.

1.04 REFERENCES

A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

B. American Society of Testing and Materials (ASTM):
   1. D448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction

C. Virginia Department of Conservation and Recreation Virginia Erosion and Sediment Control Handbook (VESCH):
   1. Chapter 3 State Minimum Standards and Specifications

D. Virginia Department of Transportation - Road and Bridge Specifications (VDOT):
   1. 414 - Riprap

1.05 QUALITY ASSURANCE
A. General: All erosion control measures shall be in accordance with Virginia Erosion and Sediment Control Handbook (VESCH), and all revisions and addenda. Methods used on site shall include, but shall not be limited to; VESCH, Chapter 3.

B. Performance Requirements: The erosion control measures shall be installed such that the erosion of disturbed ground and the siltation of storm drain pipes and inlets will be prevented.

C. Regulatory Requirements: All phases of the construction work shall comply with or exceed the minimum state requirements for controlling erosion and sedimentation from "land disturbing activities" as outlined in the "Virginia Erosion and Sediment Control Handbook" (VESCH), and all revisions and addenda thereto.
   1. Contractor is responsible for obtaining all necessary permits for the work from federal, state, or local regulatory agencies.
   2. Contractor shall keep on site and maintain all required permits, plans, and record keeping data required by regulatory agencies and permits.

1.06 MAINTENANCE

A. Maintenance Service: The erosion control measures shall be maintained by the Contractor until a vegetative groundcover is achieved, which in the opinion of the Engineer, is mature enough to control soil erosion and to survive severe weather conditions.

1.07 SUBMITTALS

A. General: Shall be in accordance with Section 01 33 00 – Submittal Procedures.

B. Materials: The Contractor shall submit to the Engineer shop plans or catalog cuts for:
   1. Materials list of items proposed to be provided under this Section.
   2. Manufacturer’s specifications and other data needed to prove compliance with the specified requirements.

1.08 STORAGE AND HANDLING

A. General: Shall be in accordance with Section 01 66 00 – Product Delivery, Storage, and Handling Requirements.

1.09 EROSION CONTROL NARRATIVE

A. General: The erosion control narrative prepared by the Engineer corresponding to these site plans shall be incorporated by reference into these specifications; the work described within the narrative shall be enforced as a part of the contract documents.

1.10 SITE CONDITIONS

A. Environmental Requirements: Properties and natural waterways adjacent to the site of land disturbance shall be protected from sedimentation by the use of the erosion control measures shown on the plans and in compliance with pertinent erosion and sediment control practices.

B. Vegetation: When conditions detrimental to plant growth are encountered such as rubble fill, adverse drainage conditions or obstructions, the Contractor shall notify Architect/Engineer before planting.

C. Planting Time: Times shall be in accordance with VESCH 3.32 Permanent Seeding.

PART 2 PRODUCTS

2.01 GENERAL

A. A. Straw Bale Barriers: Straw bale barriers shall be placed in a single row, lengthwise, along the contour and embedded in the soil to a depth of three inches. Bales must be securely
anchored in place by stakes or re-bars to prevent displacement. Barriers shall be inspected frequently and repair or replacement must be made promptly if needed.

B. Silt Fencing: Silt fence barriers shall be constructed by setting 1 inch x 2 inches x 3 feet stakes and excavating a 4 inch x 4 inch trench along the line of stakes. Staple fencing to stakes and extend into trench. Backfill and compact excavated soil, anchoring silt fence.

C. Super Silt Fence:
1. The chain link fence fabric height shall be 42 inches and pole length shall be 72 inches.
2. The poles do not need to be set in concrete.
3. The chain link fence fabric and the first layer of filter fabric shall be imbedded in the ground a minimum of 8 inches.
4. Post bracing and truss rods will not be required.
5. The filter fabric shall meet the requirements of VESCH Standard and Specification 3.05.
6. The filter fabric shall be secure to the chain link fence fabric with ties spaced at 24 inch centers along the top and mid-section.
7. Once sedimentation has reached half of the Super Silt Fence height, all accumulated sediment shall be removed and disposed of as directed by the Architect/Engineer.
8. The Contractor shall inspect all super silt fences after each rainfall event of at least 0.5 inches or greater. Any deficiencies or damage shall be repaired by the Contractor. If the Super Silt Fence is damaged or inadvertently moved during the sedimentation removal process, the contractor shall immediately replace and/or repair any Super Silt Fence after the damage occurs. The Contractor shall be responsible for all details, devices, accessories and special construction necessary to properly furnish, install, adjust and place in continuous satisfactory service and complete the work in an acceptable manner.

D. Gravel Outlet Structures: Gravel outlet structures shall be constructed of ASTM D448 #2 stone or its equivalent. The bases and side slopes of the gravel shall be placed so as to conform to the dike configuration. The invert of the outlet shall be not less than six inches lower than the top of the adjoining earth dike, and the gravel shall extend to the top of the dike. Discharge from the outlet structure shall be onto an already stabilized area or watercourse. The gravel outlet structure shall be inspected for silt accumulation after each runoff-producing rain. If structure ceases to function properly due to silt accumulation, the gravel shall be replaced.

E. Temporary Diversion Dikes: Temporary diversion dikes shall be machine compacted and have a positive grade draining to the gravel outlet structure. Periodic inspection and maintenance of the dike shall be provided to insure proper functioning of the dike.

F. Construction Entrance: Adequate stone shall be applied at entrances to the work area required or shown on the plans prior to and during construction to control dust, erosion, siltation and to maintain normal traffic. Stone used to construct the temporary construction entrance shall be ASTM D448 #1 or #2 stone as shown on the plans.

G. Riprap: Riprap shall be a rubble stone riprap, 50 to 150 pounds each, similar to VDOT 414 Class I, unless shown otherwise on plans.

H. Soil Stabilization Mat: Mat shall be a degradable multi-layered soil stabilization blanket consisting of a netting of polyethylene, nylon, vinyl, or other material intertwined with a natural organic or manmade mulch, a jute mesh or excelsior mat specifically manufactured for maintaining soil slopes until vegetation becomes established. Soil stabilization mat shall be provided by a manufacturer from VDOT’s “Approved Products List” as described in VESCH 3.36.
I. Permanent Seeding: Seeding shall be in accordance with Section 329219 – Seeding.

PART 3 EXECUTION

3.01 PREPARATION

A. General: Work shall be performed in accordance with Virginia Erosion and Sediment Control Handbook (VESCH) for appropriate installation procedures.

B. Surface Preparation for Stabilization Mat: Any storm drainage channel in which soil stabilization mat is to be installed shall be prepared for installation of the mat according to the mat manufacturer's recommendations. Any areas which are to be covered with a soil stabilization mat shall be protected from erosion prior to the installation of the mat. The protection shall include, but not be limited to, the installation and maintenance of silt fences, straw bale barriers, and temporary diversion dikes.

C. Rip Rap: Excavation of slopes, ditches, or roadways where riprap is to be placed shall be of sufficient depth to achieve finished grades shown on the plans or details. Riprap shall be in accordance with VESCH 3.19.

D. Cut and Fill Slope Preparation: Cut and fill slopes shall be constructed in a manner which will minimize erosion, in accordance with the following:
   1. All slopes steeper than 3:1 shall require surface roughening, either stair-step grading, grooving, furrowing, or tracking, if stabilized with vegetation, in accordance with VESCH 3.29.
   2. Areas with grades less than 3:1 shall have the soil surfaced lightly roughened and loosened to a depth of 4 inches prior to seeding.
   3. Areas which have been graded and will not be stabilized immediately shall be roughened to reduce runoff velocity until seeding takes place.
   4. Slopes with a stable rock face do not require roughening or stabilization.

3.02 CONSTRUCTION SEQUENCE

A. General: The Contractor shall establish a plan for construction sequence so as to minimize the effects of erosion; this sequence shall reflect the sequence of construction established in the approved erosion and sediment plans and narrative.

3.03 INSTALLATION AND APPLICATION

A. Silt Fence: Silt fences shall be installed in accordance with VESCH 3.05 and the following:
   1. Installed height of silt fence shall not exceed 36 inches.
   2. Filter fabric splice joints shall occur only at a support post, minimum 6 inch overlap, and securely sealed.
   3. Posts shall be spaced a maximum of 10 feet on centers at the barrier location and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without wire support fence, post spacing shall not exceed 6 feet on centers.
   4. A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of posts and upslope from the barrier. Eight inches of fabric shall be extended into the trench. The trench shall be backfilled and the soil compacted over the filter fabric.
   5. For extra strength filter fabric installation utilizing closer post spacing, the wire mesh support fence may be eliminated. In such case, the fabric is attached to the upslope side of the posts using heavy-duty wire staples, minimum 1 inch long, or tie wires.
   6. Filter fabric shall not be stapled to existing trees.
7. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

B. Super Silt Fence:
1. The chain link fence fabric height shall be 42 inches and the pole length shall be 72 inches. The poles do not need to be set in concrete.
2. The chain link fence fabric and the first layer of filter fabric shall be imbedded in the ground a minimum of 8 inches. Post bracing and truss rods will not be required.
3. The filter fabric shall meet the requirements of VESCH 3.05. The filter fabric shall be secure to the chain link fence fabric with ties spaced at 24 inch centers along the top and mid-section.

C. Stone and Riprap:
1. Stone on the temporary construction entrance shall be installed to a minimum depth of 1 foot.
2. Riprap shall be installed to the depth of 18 inches or as indicated on the plans, in accordance with VDOT 414. Stone shall be placed such that top of stone be within +/-2 inches of the finished grades shown on the plans or details.

D. Temporary Diversion Dike:
1. A temporary diversion ridge of compacted soil shall be located at the top and/or base of sloping disturbed areas in accordance with VESCH 3.09. Dike shall divert storm runoff from higher drainage areas away from unprotected slopes to a sediment trapping facility or to a stabilized outlet.
2. The minimum allowable height measured from the upslope side of the dike shall be 18 inches (except where dike is part of the proposed silt trap).
3. Side slopes shall be 1.5:1 or flatter. Minimum base width is 4.5 feet.
4. The channel behind the dike shall have positive grade to a stabilized outlet. Channel slope less than or equal to 2 percent shall require no stabilized outlet. Slope greater than 2 percent shall be stabilized in accordance with VESCH 3.17.

E. Temporary Sediment Trap:
1. A small temporary ponding area shall be constructed of earthen embankment with a gravel outlet across a drainage swale to detain sediment laden runoff from the disturbed areas to allow the majority of the sediment to settle out, as per VESCH 3.13. The sediment trap shall be constructed independently or in conjunction with temporary diversion dike.
2. The sediment trap shall have an initial storage volume as indicated on the plans, half of which shall be in the form of a permanent pool (see erosion control plan for required grading).
3. If excavation is required to attain the required storage volume, side slopes shall not exceed 2:1 except for the excavated wet storage area which may be at a maximum 1:1 grade.
4. The outlet for the sediment trap shall consist of a crushed stone section of the embankment located at the low point in the basin. The crest of the outlet shall be at least 1.0 feet below the top of the embankment during peak flow conditions. The outlet shall be constructed as shown in VESCH 3.13.
5. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to 1/2 the designed volume of the trap. Sediment removed from the basin shall be deposited in a suitable area and in such a manner that it will not erode.
6. The structure shall be checked regularly to insure that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the outlet shall be checked to insure that its center is at least one foot below the top of the embankment.

F. Sediment Trap Embankments:
   1. The maximum height of the sediment trap embankment shall be measured from the low point. Minimum top widths and outlet heights for various embankment heights shall be in accordance with VESCH 3.13.
   3. Sediment traps shall be removed after the contributing drainage area is stabilized. Sediment trap areas shall be restored to original or proposed final grades.
   3. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat to facilitate cleanout. The pool area shall be cleared.
   4. Fill material for the embankments shall be free of roots or other woody vegetation, organic materials, large stones, and other objectionable material. The embankment shall be compacted in 8 inch layers by traversing with construction equipment.
   5. The earthen embankment shall be seeded with temporary or permanent vegetation within 15 days of construction.
   6. Construction operations shall be implemented in such a manner that erosion and water pollution are minimized.
   7. All cut and fill slopes shall be 2:1 or flatter.

G. Construction Access Routes: Wherever construction vehicle access routes intersect paved public roads, provisions must be made to minimize the transport of sediment (mud) by runoff or vehicle tracking onto the paved surface (VESCH 3.02 and 3.03). Where sediment is transported onto a public road surface, the roads shall be cleaned thoroughly as necessary to prevent accumulation of dust, mud and siltation that create pollution or hazardous conditions. At the end of each day the paved surface shall be thoroughly cleaned to remove any/all evidence of dust, mud and siltation. Sediment shall be removed from roads by shoveling or sweeping and be transported to a sediment controlled disposal area. Street washing shall be allowed only after sediment is removed in this manner.

H. Construction Entrance: The construction entrance shall be stabilized in accordance with these specifications. Adequate stone shall be applied prior to and during construction to control dust, erosion, siltation and to maintain normal traffic.

I. Temporary Seeding: Provide temporary seeding in accordance with Section 32 92 19 – Seeding, and VESCH 3.31. Provide temporary seeding of any areas when planting time does not permit permanent seeding within 30 days after completion of subgrades and on soil stockpiles.

J. Straw Bale Barriers: Straw bale barriers shall be placed in a single row, lengthwise, along the contour and embedded in the soil to a depth of three inches. Bales must be securely anchored in place by stakes or steel reinforcing-bars to prevent displacement. Barriers shall be inspected frequently and repair or replacement must be made promptly if needed.

K. Gravel Outlet Structures: The bases and side slopes of the gravel shall be placed so as to conform to the dike configuration. The invert of the outlet shall be not less than six inches lower than the top of the adjoining earth dike, and the gravel shall extend to the top of the dike. Discharge from the outlet structure shall be onto an already stabilized area or watercourse. The gravel outlet structure shall be inspected for silt accumulation after each runoff-producing rain. If structure ceases to function properly due to silt accumulation, the silt shall be removed and gravel shall be replaced.
3.04 MAINTENANCE

A. Duration: The erosion control measures shall be maintained by the Contractor until all work covered by this contract is completed and permanent stabilization of disturbed areas has been achieved.

B. Silt Fence and Super Silt Fence:
   1. Decomposed or ineffective silt fence or filter barriers shall be replaced promptly.
   2. Sediment deposits shall be removed when deposits reach approximately one-half the height of the barrier. Sediment shall be removed from the site and disposed at an approved waste area.
   3. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, then prepared and seeded.

C. Construction Entrance Inspection: The Contractor shall inspect the construction entrance periodically. The stone in the construction entrance shall be replaced when, in the opinion of the Contractor, Owner, or Engineer, an excessive amount of mud is being carried into the public right-of-way.

D. Disposal: All temporary erosion and sediment control measures shall be disposed of within 30 days after final site stabilization is achieved or after the temporary measures are no longer needed, unless otherwise authorized by the Engineer. Trapped sediment and other disturbed soil areas resulting from disposition of temporary measure shall be permanently stabilized to prevent further erosion and sedimentation.

3.05 FIELD QUALITY CONTROL

A. General: All erosion control facilities shall be inspected by the Contractor weekly and after each significant rainfall. Inspection shall be performed daily during periods of prolonged precipitation. Any required repairs shall be made immediately.

END OF SECTION 31.25.13
SECTION 32.10.00  
BASES, BALLASTS AND PAVEMENTS

PART 1  GENERAL

1.01  SUMMARY
A. Work Included: This Section includes specifications for the furnishing of all equipment, material, and labor in connection with concrete walks, curb and gutters, curb ramps, and paving of parking areas.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 31.10.00 – Site Clearing
   3. Section 31.00.00 – Earthwork
   4. Section 03.30.01 – Cast-in-Place Concrete for Sitework

1.02  REFERENCES
A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

B. American National Standards Institute (ANSI)/American Concrete Institute (ACI):
   1. A117: Tolerances for Concrete Construction and Materials
   2. 301: Specifications for Structural Concrete
   3. 318: Building Code Requirements for Structural Concrete (ACI 318-99) and Commentary (ACI 318R-99)
   5. 347R: Guide to Formwork for Concrete

C. American Society for Testing and Materials (ASTM)
   2. A615L Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
   7. D698: Test Method for Laboratory Compaction Characteristics of Soils Using Standard Effort (12,400 ft-lb/ft3)

D. Virginia Department of Transportation Road and Bridge Specifications (VDOT):
   1. 208: Subbase and Aggregate Base Material
   2. 210: Asphalt Materials
   3. 211: Asphalt Concrete
   4. 305: Subgrade and Shoulders
5. 308: Subbase Course  
6. 309: Aggregate Base Course  
7. 310: Tack Coat  
8. 311: Prime Coat  
9. 312: Seal Coat  
10. 314: Penetration Surface Courses  
11. 315: Asphalt Concrete Pavement  
12. 502: Incidental Concrete Items  
13. 504: Sidewalks, Steps, and Handrails  
14. 515: Planing Pavement  

E. Virginia Department of Transportation Road and Bridge Standards (VDOT):  
1. CG-2: Standard 6” Curb  
2. CG-6: Combination 6” Curb and Gutter  
3. CG-12A: Perpendicular Curb Ramp (Access for Mobility Impairments)  
4. CG-12B: Parallel Curb Ramp Access for (Mobility Impairments)  
5. CG-12C: Combined (Parallel & Perpendicular) Curb Ramp (Access for Mobility Impairments)  

F. American Association of State Highway and Transportation Officials (AASHTO):  
1. T99: The moisture-density relations of soils using a 5.5 pound rammer and a 12 inch drop  
2. T119: Slump of Portland Cement Concrete  
3. T152: Air Content of Freshly Mixed Concrete by the Pressure Method  
4. T196: Air Content of Freshly Mixed Concrete by the Volumetric Method  
5. T199: Air Content of Freshly Mixed Concrete by the Chance Indicator  

1.03 QUALITY ASSURANCE  
A. Restrictions: The VDOT Standards and Specifications shall define temperature restrictions, application procedures, mix components, and material references. All materials and application procedures shall be in accordance with VDOT Standards and Specifications.  
B. Cast-in Place Concrete: Unless shown otherwise, cast-in-place concrete shall comply with the Building Code Requirements for Structural Concrete (ANSI/ACI 318) and all applicable requirements of the Specifications for Structural Concrete (ANSI/ACI 301).  
C. Mix Designs: Do not commence placement of pavement until mix designs have been reviewed and approved by the Engineer and all governmental agencies having jurisdiction, and until copies of the approved mix designs are at the job site and the batch plant.  
D. Testing: The Geotechnical Engineer or Owner’s representative shall observe the following to determine if the work has been performed in accordance with these specifications:  
   1. Subgrade prior to placing base stone.  
   2. Base stone prior to laying asphalt.  
   3. Surface course application.  
E. It is the Contractor’s responsibility to coordinate inspections with the Geotechnical Engineer.  

1.04 SUBMITTALS  
A. General: Submittals shall be made in accordance with Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures at least two weeks prior to construction. Provide submittals for the following:  
   1. Concrete Mix Design  
   2. Steel Reinforcement  
   3. Welded Wire Reinforcement
B. Concrete Mix Designs:
   1. Within 30 calendar days after award of the Contract, and prior to proceeding with any concrete work, secure concrete mix designs from the concrete supplier, and submit to the Engineer for review and approval.
   2. Distribute approved mix designs to testing laboratory, batch plant, job site, and governmental agencies having jurisdiction.

1.05 SITE CONDITIONS

A. Asphalt Paving Limitations:
   1. Aggregate base course may be placed when air temperature is above 30 degrees F.
   2. Apply prime and tack coats when ambient temperature is above 50 degrees F. (10 degrees C) and when temperature has not been below 35 degrees F. (1 degree C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
   3. Construct asphalt concrete base and surface course only when atmospheric temperature is above 40 degrees F. (4 degrees C) and when base is dry.

B. Portland Cement Concrete Limitations: Placement of concrete shall be restricted to conditions defined in Section 03 30 01 – Cast-in-Place Concrete for Sitework.

1.06 MAINTENANCE

A. Streets: The Contractor shall maintain and repair existing streets as necessary during the construction period and provide for additional applications of compacted stone after completion of trenching and prior to paving, as required.

B. Roadway and Parking Areas: The Contractor shall maintain and repair the road and parking areas as necessary during the construction period and provide for additional applications of compacted stone after completion of trenching and prior to paving, as required.

PART 2 PRODUCTS

2.01 PAVEMENT REPAIR

A. General: Pavement if disturbed, shall have the edges clean cut, then repaired with a bituminous concrete, VDOT Type SM-9.5 at least 1 1/2 times the thickness of the original surface material but in no case less than 2 inches. Pavement seal or overlay, where required, for perpendicular pavement cuts or roadway crossings shall conform to the requirements of VDOT’s LUP-OC policy document. In cases of pavement cuts parallel to the road centerline, the entire width of the pavement shall have a pavement seal or overlay applied after initial patching, extending over the entire length of the patching plus 5 feet at each end as measured along the road centerline.

B. Pavement Seal for Surface Treated Pavement: Where required, pavement seal shall be performed in accordance with VDOT Sections 312 and 314 and shall consist of:
   1. CRS-2 Liquid Asphalt 0.30 Gal/S.Y.
   2. VDOT #8 Cover Stone 25 lbs/S.Y.

C. Pavement Overlay for Asphalt Concrete Pavement: Where required, pavement overlay shall be performed in accordance with VDOT Section 315 and shall consist of:
   1. SM-9.5 Asphalt Concrete - thickness shall be 2 inches unless otherwise indicated.

2.02 ASPHALT CONCRETE PAVING AND SURFACING
A. General: All materials and methods for the construction of the travelway and parking paving shall be in accordance with applicable provisions of the VDOT specifications referred to hereinafter by section.

B. Subgrade: Subgrade shall conform to VDOT Section 305

C. Base Courses:
   1. Aggregate base course shall consist of VDOT #21B aggregate base material and shall conform to VDOT Section 208.
   2. Prime coat shall consist of liquid asphalt material meeting the requirements of VDOT Section 311.
   3. Bituminous concrete base course shall consist of bituminous concrete base material VDOT Type BM-25.0 and conform to VDOT Section 315.

Intermediate Course:
   4. Tack coat shall consist of liquid asphalt material meeting the requirement of VDOT Section 310.
   5. Bituminous concrete intermediate course shall consist of bituminous concrete intermediate material VDOT Type IM-19.0 and conform to VDOT Section 315.

D. Surface Course and pavement Overlay:
   1. Tack coat shall consist of liquid asphalt material meeting the requirements of VDOT Section 310.
   2. Bituminous concrete surface course or overlay shall consist of bituminous concrete surface material VDOT Type SM-9.5 and shall conform to VDOT Section 211.

2.03 CONCRETE PAVEMENT AND WALKS

A. General: All concrete shall be air entrained and comply with Section 03 3001 – Cast-in-Place Concrete for Sitework.

B. Formwork:
   1. General: Metal forms are preferred over wooden forms for the sidewalk installation. Form work shall be designed and constructed to insure that the finished concrete will conform accurately to the indicated dimensions, lines, and elevations, and within the tolerances specified. Forms shall be of wood or steel, straight, of sufficient strength to resist springing during depositing and consolidating concrete. Wood forms shall be surfaced plank, 2 inch nominal thickness, straight and free from warp, twist, loose knots, splits or other defects. Wood forms shall have a nominal length of 10 feet. Radius bends may be formed with ¾ inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Ends of steel forms shall be interlocking and self-aligning. Steel forms shall include flexible forms and radius forming, corner forms, form spreaders, and fillers. Steel forms shall have a nominal length of 10 feet with a minimum of two welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips designed for use with steel forms. Pointed tips designed for use with steel forms.
   2. Sidewalk Form: Sidewalk forms shall be of a height equal to the full depth of the finished sidewalk.
   3. Curb and Gutter Forms: Curb and gutter outside forms shall have a height equal to the full depth of the curb and gutter. The inside form of curb shall have batter as indicated and shall be securely fastened to and supported by the outside form. Rigid forms shall be provided for curb returns, except that bender or thin plank forms may be used for curb or curb returns with a radius of 10 feet or more, where grade changes occur in the return, or
where the central angle is such that a rigid form with a central angle of 90 degrees cannot be used. Back forms for curb returns may be made of 1 ½ inch benders, for the full height of the curb, cleated together.

C. Reinforcement:
1. General: Reinforcement steel shall be the size shown on the plans with all bars being billet steel, grade 40 or 60 (ASTM A615).
2. Welded Wire: Shall be placed in sidewalk areas and shall conform to ASTM A185. Size shall be as indicated on the plans.

D. Expansion Joints:
1. General: Expansion joints are to be provided at locations shown on the plans or at other locations during construction as approved by the Owner. (Joints shall be filled with a premolded expansion joint filler complying with ASTM D1751.
2. Characteristics: The expansion joint shall have the following properties:
   3. Density of 25 pounds per cubic foot.
   4. Asphalt content of 40 percent by volume.
   5. Water absorption of 9.4 percent by volume.
   6. Compressive strength of 475 psi at 50 percent deflection.
   7. Joint fillers shall be non-extruding, ½ inch thickness complying with ASTM D1751 specifications.
   8. Surface Sealant: Sealant for the expansion joint shall be an epoxidized polyurethane material or equal designed for dynamically moving joints to withstand extension up to 40 percent and compression up to 25 percent. Color shall match concrete surface. Material shall be Tremco “Dymeric” or equal by GE, Pecora, or Dow Corning. Sealant shall not extend above the surface elevation of walks.
   9. Dowelling: New sections of sidewalk shall be doweled into existing sidewalk with 10” long, #4 deformed reinforcing steel. The half of the reinforcing steel embedded in new concrete shall be sleeved with a PVC sleeve. The end of the sleeve which is embedded in the new concrete shall be sealed with plastic tape. The other half of the reinforcing steel shall be installed in holes drilled in the existing sidewalk. The dowels shall be installed 12” O.C. and shall have a minimum of 2” of concrete cover, top and bottom. All new sidewalk, utility pads, and dumpster pads shall also be doweled at expansion joints.

2.04 WHEEL STOPS
A. Material: 4,000 psi concrete.

PART 3 EXECUTION

3.01 GENERAL
A. Grading: Uniformly smooth grade excavated areas, filled sections and adjacent transition areas. Subgrade shall be rolled and compacted prior to stone application. Earthwork shall be in accordance with Section 31 0000 - Earthwork of these specifications.
B. Subbase and Base Courses: Aggregate base courses shall be placed in accordance with VDOT Sections 308 and 309. Coordinate with work of Section 31 00 00 – Earthwork, in the compaction of base course.
C. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
D. Barricades: Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

E. Surface Drainage: The surface of all paving work shall slope and drain surface water toward catch basins or swales. If water stands, paving shall be corrected to prevent standing water, subject to the Engineer’s approval.

F. Connections to Existing: Where new work connects to or adjoins existing sidewalk, curb and gutter, or pavement, existing surface shall be saw cut in a straight line at point of connection. Expansion joint material shall be installed, when applicable. Finished surfaces shall be continuous providing a smooth transition between existing and new work.

3.02 ASPHALT PAVING AND SURFACING

A. General. Asphalt concrete pavement construction shall be in accordance with the details on the plans and construction shall be in accordance with VDOT Section 315.

B. Where pavement overlay is to be installed, all existing and proposed valve boxes, structure rims, and any other utility appurtenances within the overlay area, shall be adjusted to be flush with finished grade. This work shall be performed at no additional cost to the owner.

3.03 CONCRETE PAVING AND WALKS

A. General: Construction shall be in accordance with Section 03 30 01 – Cast-in-Place Concrete for Sitework, except as noted otherwise.

B. Subgrade: The subgrade shall be maintained in a smooth compacted condition in conformity with the required section and established grade until the concrete is placed. The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected so as to produce a subgrade free from frost when the concrete is deposited.

C. Bedding: Concrete shall be placed on a minimum of 2 inches of VDOT #21B stone or other stone approved by Owner’s representative unless shown otherwise on the plans. Bedding shall be placed on firm, undisturbed subgrade.

D. Thickness: Concrete thickness shall match that of the existing concrete unless otherwise noted on the plans. Concrete shall, under no circumstances be less than 6 inches thick.

E. Width: Pavement and sidewalk width shall match that of the existing unless otherwise noted on the plans. The width of the sidewalk shall be measured from the back of the curb.

F. Slopes: Sidewalks, unless otherwise noted on the plans, shall slope toward drainageways at a minimum of ¼ inch to 1 foot.

G. Form Setting: Forms shall be carefully set to the indicated alignment, grade and dimensions. Forms shall be held rigidly in place by a minimum of three stakes per form placed at intervals not to exceed 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms. Any concrete found defective after form removal shall be promptly and satisfactorily repaired at no cost to the Owner. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

1. Sidewalks: Forms for sidewalks shall be set with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10 foot long section. After forms are set, grade and alignment shall be checked with a 10 foot straightedge. Forms shall have a transverse
slope (as indicated of a minimum ¼ inch per foot) with the low side adjacent to the roadway. Side forms shall not be removed for 12 hours after finishing has been completed.

2. Curbs and Gutters: The forms of the front of the curb shall be removed not less than 2 hours nor more than 6 hours after the concrete has been placed. Forms back of curb shall remain in place until the face and top of the curb have been finished as specified for concrete finishing. Gutter forms shall not be removed while the concrete is sufficiently plastic to slump in any direction.

H. Expansion Joints: The Contractor shall install expansion joints at the locations shown on the plans. The distance between expansion joints shall not exceed 30 feet. Installation of the expansion joints shall be in accordance with the manufacturer's recommendations.

I. Control Joints: The Contractor shall divide concrete sidewalk into sections, the length of which match the existing sidewalk, by transverse control joints formed by a trowel or jointing tool. These control joints shall be at least 1/4 of the slab depth and 1/8-inch wide and match in appearance the joints in the existing sidewalk.

J. Handicapped Access Ramps: The minimum width of handicapped access ramps shall be 36 inches excluding the flared sides. The maximum slope of ramp runs shall be 1:12. All handicapped access ramp construction shall conform to ANSI A117.1 using dimensions shown on VDOT Standards CG-12A, CG-12B, and CG-12C. Detectable warning in walking surface is required.

K. Finish Surface: The finished surface including control joints and edging of the new concrete shall match that of the existing concrete. The finished surface shall exhibit a uniform texture free from irregularities. No water shall pond on the finished surface. Areas which exhibit excessive cracking, discoloration, form marks or tool marks or which are otherwise inconsistent with the overall appearances of the work shall be removed and replaced at no additional cost to the Owner.

L. Protection: Contractor shall protect uncured concrete from vandalism. Any damage to concrete work prior to acceptance by Owner shall be repaired by the Contractor at no expense to the Owner.

M. Weather: Concrete shall be placed based on the following conditions:

1. Placing During Cold Weather: Concrete placement shall be discontinued when the air temperature reaches 40 degrees F and is falling. Provisions shall be made to protect the concrete from freezing during the specified curing period. If necessary to place concrete when the temperature of the air, aggregates, or water is below 35 degrees F, placement shall be approved in writing. Approval shall be contingent upon full conformance with the following provisions. The underlying material shall be prepared and protected so that it is entirely free of frost when the concrete is deposited. Mixing water and aggregates shall be heated as necessary to result in the temperature of the in-place concrete being approved. The aggregates shall be free of ice, snow, and frozen lumps before entering the mixer. Covering and other means shall be provided for maintaining the concrete at a temperature of at least 50 degrees Fahrenheit for not less than 72 hours after placing, and at a temperature above freezing for the remainder of the curing period. Do not use antifreeze agents or chemical accelerators, unless written approval for such use has been given by the ENGINEER. All work with concrete when air temperature is below 40 degrees F shall comply with ANSI/ACI 306R and as specified herein.

2. Placing During Warm Weather: The temperature of the concrete as placed shall not exceed 85 degrees F except where an approved retarder is used. The mixing water and/or
aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. In no case shall the placing temperature exceed 95 degrees F.

3. Temperature: Concrete shall not be placed when the temperature is below 40 degrees Fahrenheit or placed against frozen or frosted concrete. Concrete shall not be placed on frozen subgrade.

N. Concrete Curb: Concrete curb shall be in accordance with VDOT Standards CG-2 as shown on the plans. Combination curb and gutter shall be in accordance with VDOT Standards CG-6 as shown on the plans. All concrete curbing shall be in accordance with VDOT Section 502.

O. Curb Ramps, Concrete Steps, and Sidewalk Transitions: Shall be in accordance with VDOT Section 504.

P. Construction Joints: Transverse joints for crack control shall be in accordance with VDOT Section 502.

Q. Concrete Finishing: Except as may be shown otherwise on Drawings, provide the following finish-es at the indicated locations. Finishes for concrete other than listed here shall be in accordance with Section 03 30 01 – Cast-in-Place Concrete for Sitework.
   1. Trowel Finish: apply to curbs and gutters and other surfaces that are to be exposed to view, unless otherwise shown.
   2. Nonslip Broom Finish: apply to all concrete walks, and steps except ramps.

3.04 FIELD QUALITY CONTROL

A. Subgrade Testing: The subgrade shall be tested for grade and cross section by means of a template extending the full width of the sidewalk and/or curb and gutter. The subgrade shall be of materials equal in bearing quality to the subgrade under the adjacent pavement.

B. Thickness Deficiency: When measurements indicate that the completed concrete sections is deficient in thickness by more than 0.25 inch the deficient section will be removed, between regularly scheduled joints, and replaced.

C. High Areas: In areas not meeting surface smoothness and plan grade requirements, high areas shall be reduced either by rubbing the freshly finished concrete with carborundum brick and water when the concrete is less than 36 hours old or by grinding the hardened concrete with an approved surface grinding machine after the concrete is 36 hours old or more. The area corrected by grinding the surface of the hardened concrete shall not exceed 5 percent of the area of any integral slab, and the depth of grinding shall not exceed ¼ inch. All pavement areas requiring grade or surface smoothness corrections in excess of the limits specified above shall be removed and replaced.

D. Remedial Work: Repair or replace deficient work as directed by the Engineer and at no additional cost to the Owner.

END OF SECTION 32.10.00
SECTION 32.17.23
PAVEMENT MARKINGS

PART 1 GENERAL

1.01 DESCRIPTION
A. Work Included: Provide pavement marking in the arrangement shown on the Plans, as specified herein, and as needed for a complete and proper installation.
B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures

1.02 QUALITY ASSURANCE
A. General: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.03 SUBMITTALS
A. General: Submittals shall be in accordance with Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures.
B. Within 30 calendar days after receipt of the OWNER's Notice to Proceed, submit:
   1. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
   2. Manufacturer's recommended installation procedures which, when approved by the Engineer, shall become the basis for accepting or rejecting actual installation procedures used on the work.

PART 2 PRODUCTS

2.01 PAVEMENT MARKING PAINT
A. General: Provide white paint specifically formulated for use as pavement marking in automobile traffic areas. Paint shall be equal to highway marking paint specified by the Virginia Department of Transportation.

2.02 OTHER MATERIALS
A. General: Provide other materials, not specifically described but required for a complete and proper installation, as selected by the CONTRACTOR subject to the approval of the ENGINEER.

PART 3 EXECUTION

3.01 SURFACE CONDITIONING
A. General: Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
B. Curing: Verify that the asphalt concrete paving has cured such that the pavement marking paint may be properly applied.

3.02 APPLICATION
A. General: Provide proper masking and spray application equipment recommended for this use by the manufacturer of the paint material provided. Apply the paint in strict accordance with the recommendations of the paint manufacturer.

B. Markings: Pavement markings shall be spray applied, in neat, straight lines, 4 inches in width. Lines shall stop 6 inches short of curb and sidewalk edge. Diagonal lines at accessible space shall be spaced 12 inches on center.

3.03 PROTECTION AND CLEANUP

A. General: Provide traffic cones, barricades, and other devices needed to protect the paint until it is sufficiently dry to withstand traffic.

B. Inspection: When paint is sufficiently dry, visually inspect the entire application, and touchup as required to provide uniform opaque color and clean, straight lines and surfaces throughout. Where required, provide permanent opaque paint in color matching the asphalt concrete paving to block out overspray. Eliminate all traces of splashed, tracked or spilled paint from all adjacent surfaces.

END OF SECTION 32.17.23
SECTION 32.31.13
CHAIN LINK FENCE AND GATES

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Posts, rails, and frames.
B. Wire fabric.
C. Concrete.
D. Manual gates with related hardware.

1.02  RELATED REQUIREMENTS
A. Section 03.30.00 - Cast-in-Place Concrete: Concrete anchorage for posts.

1.03  REFERENCE STANDARDS
I. CLFMI CLF-FIG0111 - Field Inspection Guide; 2014.

1.04  SUBMITTALS
A. See Section 00.70.00 – General Conditions, for submittal procedures.
B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.

1.05  QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
1.06 WARRANTY
   A. See Section 00.72.00 – General Conditions, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Chain Link Fences and Gates:
      3. Substitutions: See Paragraph 4 of Section 00.70.00 – General Conditions.

2.02 MATERIALS
   A. Posts, Rails, and Frames:
      1. ASTM A1011/A1011M, Designation SS; hot-rolled steel strip, cold formed to pipe
         configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc
         coating conforming to ASTM F1043 and ASTM F1083.
      2. Line Posts: Type I round.
      3. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round.
      4. Conform to CLFMI CLF-PM0610.
   B. Wire Fabric:
      1. ASTM A392 zinc coated steel chain link fabric.
      2. Gauge: 13 gauge core, 9 gauge finish.
      5. Conform to CLFMI CLF-PM0610.
      6. Provide coil spring tension wire at bottom of fence
   C. Concrete:
      1. Type specified in Section 03.30.00.

2.03 COMPONENTS
   A. Line Posts: 1.9 inch diameter.
   B. Corner and Terminal Posts: 2.38 inch diameter.

2.04 MANUAL GATES AND RELATED HARDWARE
   A. Hardware for Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller
      gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open
      position.
   B. Hinges: Finished to match fence components.
      2. Mounting: Center.
   C. Latches: Finished to match fence components.
      2. Locking: Mechanical.

2.05 ACCESSORIES
   A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.
B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.

2.06 FINISHES
A. Components: PVC coating over galvanized components.
   1. PVC thickness: .0015” to .0025”
B. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.
C. Accessories: Same finish as components.
D. Color: Black.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verification of Conditions: Verify that areas are clear of obstructions or debris.

3.02 INSTALLATION
A. Install framework, fabric, accessories and gates in accordance with ASTM F567.

3.03 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch.
B. Maximum Offset From True Position: 1 inch.
C. Do not infringe on adjacent property lines.

3.04 FIELD QUALITY CONTROL
A. Layout: Verify that fence installation markings are accurate to design, paying attention to gate locations, underground utilities, and property lines.
B. Fence Height: Randomly measure fence height at three locations or at areas that appear out of conformance against design.
C. Gates: Inspect for level, plumb, and alignment.
D. Workmanship: Verify neat installation free of defects. See CLFMI CLF-FIG0111 for field inspection guidance.

3.05 CLEANING
A. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
B. Clean fence with mild household detergent and clean water rinse well.

END OF SECTION 32.31.13
SECTION 32.91.19
TOPSOIL PLACEMENT AND GRADING

PART 1 GENERAL

1.01 DESCRIPTION
A. Work Included: Prepare and place topsoil on a previously prepared subgrade.
B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 31.00.00 - Earthwork
   2. Section 32.92.19 - Seeding

1.02 REFERENCES
A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in these specifications using the abbreviations shown:
B. Virginia Department of Transportation – Road and Bridge Specifications (VDOT):
   1. 602: Topsoil
C. Virginia Erosion and Sediment Control Handbook (VESCH):
   1. 3.30: Topsoiling

1.03 DELIVERY, STORAGE AND HANDLING
A. General: Topsoil shall be stripped and stockpiled in accordance with Sections 31.10.00 – Site Clearing and 31.00.00 - Earthwork and shall conform to the pertinent provisions of VESCH 3.30.

1.04 MAINTENANCE
A. Erosion: Employ erosion and sediment control practices as necessary to prevent soil erosion until adequate vegetative cover has developed. Topsoil which erodes shall be replaced with topsoil of like character until adequate vegetative cover has developed.

PART 2 PRODUCTS

2.01 GENERAL
A. Topsoil shall conform to the pertinent provisions of VESCH 3.30 and VDOT Section 602, except as described herein.
B. Use all on-site stockpiled topsoil which is free from matted weeds and sod; clods and stones larger than 1/2 inch; toxic substances, litter, or other deleterious material.
   1. Topsoil must also be free of plant parts of Quackgrass, Johnsongrass, Mugwort, Netsedge, Poison Ivy, Canadian Thistle or other species which might compete with the desired plant growth.
   2. Topsoil shall not contain toxic substances harmful to plant growth, such as pesticide residues.
   3. Additional Topsoil: As needed, Contractor shall provide topsoil from outside the project.

PART 3 EXECUTION
3.01 PREPARATION

A. General: Preparation of subgrade shall follow the processes described in VESCH 3.30 and VDOT Section 602.

B. Preparation: Unless otherwise designated on the plans or directed by the Architect/Engineer, areas designated to receive topsoil shall be graded, shaped, and then scarified or tilled by disk, harrowing, or other approved methods to a depth of approximately 2 inches. Topsoil shall be applied only when the subsoil is in a loose, friable condition. This will enable the topsoil layer to sufficiently bond to the underlying subgrade layer. Subsoil on slopes that have been horizontally grooved in accordance with the plans shall not be loosened.

C. Approval: Topsoil shall be placed only upon friable graded surfaces which have been approved by the Architect/Engineer.

3.02 APPLICATION

A. General: Application of topsoil shall follow the process as described in VESCH 3.30 and VDOT Section 602. Topsoil shall conform to the grades and elevations as shown on the plans.

B. Distribution: Stockpiled topsoil shall be uniformly distributed over all denuded areas. Topsoil shall have a minimum thickness of 4 inches after natural settlement and light rolling, or greater depth if specified on the plan drawings.

C. Applying Topsoil: The loose depth of topsoil shall be sufficient to allow the area to conform to the elevations shown on the plans after topsoil settles. After topsoil has been applied, large clods, hard lumps, and stones larger than 3/4 inch in greatest dimension. Areas shall be machine raked or hand raked so as to provide a smooth yard suitable for mowing. When the topsoiling operation is complete, the area shall be in a condition to receive seed, sod, or plants without further soil preparation. Areas shall be seeded within 7 calendar days after topsoiling is completed.

D. Applying Topsoil in Field Areas: Application of topsoil to areas for athletic / recreation fields shall be accomplished by placing material in at least two lifts. The first lift, approximately two to three inches in depth, shall be tilled / scarified utilizing an approved discing or tine tillage implement to a depth of three to four inches to bond the topsoil with the underlying subgrade materials.

E. Compaction: Topsoil shall be compacted by one pass of a cultipacker, roller, or other approved equipment weighing 100-160 pounds per linear foot of roller.

F. Conditions: Topsoil shall not be placed when either the topsoil or the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading.

3.03 QUALITY ASSURANCE

A. General: Topsoil which is inadequate or unsuitable for healthy plant growth shall be disposed of by the Contractor and replaced as necessary with topsoil similar in texture and composition to other on-site topsoil, at no additional cost to the Owner.

END OF SECTION 32.91.19
SECTION 32.92.19

SEEDING

PART 1 GENERAL

1.01 DESCRIPTION
   A. Work Included: Furnish and install lime, fertilizer, seed, mulch, and water on all disturbed areas on the site, in strict accordance with this Section and as shown on the drawings. Work in this section includes permanent seeding and, when required, temporary seeding.
   B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
      2. Section 32.91.19 – Topsoil Placement and Grading

1.02 REFERENCES
   A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
   B. Virginia Department of Transportation Road and Bridge Specifications (VDOT):
      1. 244: Roadside Development Materials
      2. 602: Topsoil
      3. 603: Seeding
      4. 606: Soil Retention Coverings
   C. Virginia Erosion and Sediment Control Handbook (VESCH):
      1. 3.31: Temporary Seeding
      2. 3.32: Permanent Seeding
      3. 3.35: Mulching
      4. 3.36: Soil Stabilization Blankets and Matting

1.03 SUBMITTALS
   A. General: When requested by the Architect/Engineer at any time during the landscape installation, Contractor shall submit the following in accordance with the Conditions of the Contract.
      1. Soil Analysis: Soil analysis test reports and soil amendment application rate recommendation shall be submitted and approved prior to the commencement of seeding operations.
      2. Hydroteening: When hydroteening is proposed, Contractor shall submit information on the mixture to be used including fertilizer, lime, and mulch.
      3. Proposed Seed and Application: Contractor shall furnish documentation on proposed seed, rates, application, fertilization, etc. for Architect / Engineer to review and approve prior to purchase and application.
      4. Product Data: Contractor shall furnish labels or other appropriate product data for landscape materials. This may include but is not limited to: labels showing lime and fertilizer analysis; labels showing seed mixture contents and analysis; and labels from geotextile fabrics and similar materials.
      5. Samples: Contractor shall furnish samples of landscape materials.

1.04 QUALITY ASSURANCE
A. General: Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Equipment: Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

C. Seed: Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

D. Soil Amendments: Provide fertilizers, lime and other soil amendments in containers showing analysis, contents, and volume or weight.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery: All seed shall be kept cool, dry and free of contaminants during transportation. Seed and soil amendments shall be delivered in original, unopened containers with appropriate labels attached.

B. Storage: Seed which is not sown within 24 hours after delivery shall be stored as follows, unless other methods of storage are requested by the Contractor and approved by the Engineer.
   1. Seed storage location shall be cool, dry, and sheltered from wind, traffic and construction activities.
   2. Fertilizers, lime, herbicides, insecticides, and other agricultural chemicals shall be stored separately from the seed.

C. Replacement: Seed which is heated, moistened, or otherwise damaged during transportation or storage shall be rejected and replaced by the Contractor at no additional cost to the Owner. Seed in damaged or opened packaging shall be rejected and replaced by the Contractor at no additional cost to the Owner.

1.06 PROJECT CONDITIONS

A. General: For areas specifically designated on the plans, the Contractor shall analyze the topsoil and base soil amendment application rates on recommendations received. For areas not specifically designated on the plans, the Contractor may elect to analyze topsoil and base application rates on recommendations received, in lieu of rates specified herein.

B. Soil Analysis: Results from the soil analysis required in Section 32 91 19 – Topsoil Placement and Grading will be provided for use in determining what amendments will be necessary for the soil as part of the seeding process.

1.07 WARRANTY

A. General: Contractor shall perform periodic inspection of the seeded areas during the warranty period.

B. Warranty Maintenance (Contractor): Contractor shall provide, during the warranty period, maintenance as necessary to establish a healthy uniform stand of turf. Contractor’s maintenance shall generally include overseeding, application of amendments, and repair of erosion as necessary.

C. Warranty Maintenance (Owner): On building sites and easements outside of highway rights-of-way, property Owner shall provide routine maintenance of seeded areas during the warranty period including water, and mowing. It shall be the Contractor’s responsibility during the warranty period to provide written notice of any unsuitable or inappropriate maintenance practice to the Owner and Architect/Engineer, which in the Contractor’s opinion,
is adversely affecting turf growth. In the event of conflict, Architect/Engineer will render an opinion binding on both parties.

1.08 MAINTENANCE

A. General: Seeded areas shall be maintained as necessary to establish a healthy, uniform stand of turf until substantial completion. Maintenance shall consist of watering, mowing, fertilizing, weed removal, disease and insect removal, and where erosion occurs, repair.

PART 2 PRODUCTS

2.01 MATERIALS

A. Grass seed: Seed shall comply with all applicable state and federal seed laws and contract requirements. Seed shall comply with provisions of VESCH 3.31 or 3.32 and VDOT Section 244.
   1. Grass seed shall consist of pure, live, certified grass seed mixture, of the latest crop, and containing weed seed less than 0.5 percent by weight of the total mixture.
   2. All grass seed used for turfgrass in athletic / recreation field areas shall be listed among the “Category 1 / Recommended” varieties listed in the most recent Virginia Turfgrass Variety Recommendations published annually by Virginia Tech and the Virginia Cooperative Extension as part of the Virginia and Maryland National Turfgrass Evaluation Program (NTEP).
   3. Seed mixture for permanent seeding shall be a 90% Tall Fescue and 10% Blue Grass blend (percentages by weight) applied at 4 pounds of Pure Live Seed (PLS) per thousand square feet of area (4 lbs PLS / 1000 SF).
   4. Seed mixture(s) for temporary seeding shall consist of two seed types selected from the appropriate mixture in the table below. Selection of the particular mixture shall be based on the time of year during which seeding is to occur. Numbers indicate pounds of seed per acre.

B. Fertilizer: Fertilizer shall be commercially-prepared and granular. Fertilizer shall be uniform in composition, dry, and free-flowing.
   1. Fertilizer must comply with pertinent provisions of VESCH and VDOT Section 244 Fertilizer shall conform to all applicable state and federal regulations.
   2. Fertilizer for permanent seeding shall be complete with a 10-20-10 or 15-30-15 analysis (percentages by weight of nitrogen, phosphorous and potassium, respectively) or as recommended in the soil test report and approved by the Architect/Engineer.
   3. Fertilizer for temporary seeding shall be complete with a 10-20-10 or 15-30-15 analysis (percentages by weight of nitrogen, phosphorous and potassium, respectively).

C. Mulch: Oat or wheat straw shall be used. Straw shall be dry and free from weeds, weed seeds, and foreign matter detrimental to plant life. Mulch shall conform to VDOT Section 244.

D. Straw blanket: Straw blanket shall consist of a 100 percent straw blanket sewn into a lightweight photodegradable net. The straw blanket shall be designed for installation on 3:1 and steeper slopes. Weight of blanket shall be approximately 0.5 pounds per square yard. Straw blankets shall be used in areas indicated on plans.

E. Paper matting: Paper matting shall consist of a flexible knitted construction of high strength degradable yarn interwoven with strips of biodegradable paper. Weight of matting shall be approximately 0.2 pounds per square yard.
F. Water: Water shall be potable or clean water free of contaminants harmful to plant growth. Brackish water shall not be used.

G. Lime: Unless otherwise noted, lime shall be agricultural ground or pulverized limestone.

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>Southern Piedmont and Coastal Plain</th>
<th>Northern Piedmont and Mountains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feb. 16 – April 30</td>
<td>March 1 – April 30</td>
</tr>
<tr>
<td></td>
<td>May 1 – Aug. 30</td>
<td>May 1 – Aug. 15</td>
</tr>
<tr>
<td></td>
<td>Sept. 1 – Nov. 15</td>
<td>Aug. 16 – Oct. 31</td>
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<tr>
<td></td>
<td>Nov. 16 – Jan. 31</td>
<td>Nov. 1 – Feb. 28/29</td>
</tr>
<tr>
<td>Oats (Avena sativa)</td>
<td>50</td>
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</tr>
<tr>
<td>Rye (Secale cereale)</td>
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<td>-</td>
</tr>
<tr>
<td>Foxtail Millet (Setaria italica)</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>Annual Ryegrass (Lolium multifolium)</td>
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<td>-</td>
</tr>
<tr>
<td>Weeping Lovegrass (Evagrostis curvula)</td>
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<td>40</td>
</tr>
<tr>
<td>Korean Lespedeza (Lespedeza stipulacea)</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

**PART 3 EXECUTION**

**3.01 PREPARATION**

A. General: Rake the soil surface to remove all root clumps, stones, and debris 1 inch or greater in size. True up all depressions and edges. Soil in the area to be seeded shall be prepared in accordance with VESCH 3.36 and VDOT Section 602 and 603.

B. Grading: Establish a smooth grade, free of irregularities or undulations, suitable for mowing, and ready to receive seed. Finish grade must conform to the grades and elevations as shown on the plans.

C. Topsoil: Topsoil shall be in place for all areas to be permanently seeded in accordance with Section 32 9119.13 – Topsoil Placement and Grading.

**3.02 APPLICATION**

A. General:

1. Seeding shall conform with VESCH 3.31 or VESCH 3.32, and VDOT Section 603. Initial seeding shall consist of uniformly applying seed, mulch, and water on prepared areas. Over-seeding shall consist of applying seed, mulch, and water to areas previously seeded.

B. Lime:
1. Apply lime uniformly at the rate of 2 tons per acre or as recommended in the soil test report, using approved application method. After application, the soil shall be loosened to a depth of 4 inches by disking, harrowing, or other approved method. Washed and disturbed areas shall be final dressed prior to applying fertilizer. Lime application is not required for areas to be temporarily seeded for periods less than 4 months.

C. Fertilizer:
1. Incorporate fertilizer into top 4 inches of soil by discing or power rake.
2. For areas to be permanently seeded, apply fertilizer uniformly at the rate of 1000 pounds per acre for 10-20-10, 670 pounds per acre for 15-30-15, or as recommended in the soil test report.
3. For areas to be temporarily seeded, apply fertilizer uniformly at the rate of 500 pounds per acre for 10-20-10 or 335 pounds per acre for 15-30-15.

D. Seeding Time:
1. Seed shall be sown during favorable weather conditions. Seed shall not be sown when the ground is frozen or when air temperatures are below freezing. Do not sow under windy conditions.

E. Seeding:
1. Sow seed uniformly, dividing the selected rate in half and sowing in cross directions using a mechanical spreader. Do not allow seed to drift into adjacent planting beds.

F. Raking:
1. After machine sowing, lightly cover seed and provide a smooth surface by raking.

G. Mulching:
1. Mulching shall comply with the pertinent provisions of VESCH 3.35 and VDOT Section 603.
2. Apply mulch within 48 hours of sowing seed. Apply mulch of loose straw uniformly at the rate of 2 tons per acre. Between October 16 and January 31, the application rate shall be increased to 3 tons per acre. Mulch shall be anchored to the seeded surface by discing, netting, or by other methods approved by the Architect/Engineer.
3. Areas to be temporarily seeded need be mulched only during the fall or during the summer when weather conditions are excessively hot or dry.
4. On slopes steeper than 2:1, paper matting shall be installed after fertilizing and seeding to serve as both mulch and mulch anchor. Application of matting shall be according to VESCH 3.36 and VDOT Section 606.

H. Watering:
1. Immediately after completion of mulching, apply water thoroughly to mulch and seedbed with a fine mist spray. Water heavily once per week during dry weather until a thick cover of grass is established.

I. Hydroseeding:
1. Hydroseeding may NOT be used as an alternative application method.

END OF SECTION 32.92.19
SECTION 33.03.00
UTILITY PIPE AND MATERIALS

PART 1  GENERAL

1.01 DESCRIPTION

A. Work Included: The work in this section shall include the furnishing, installation, and testing of all pipe, fittings and structures, and furnishing the equipment, labor, and appurtenances for the installation of piped utilities. All work shall be completed as shown on the plans and as specified in related sections and hereunder.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section Include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 33.04.00 - Valves and Cocks
   3. Section 31.23.33- Trenching and Backfilling
   4. Section 33.10.00 - Water Utilities
   5. Section 33.46.00 – Subdrainage

1.02 REFERENCES

A. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.

B. American Association of State Highway and Transportation Officials Publications (AASHTO):
   1. M 252: Corrugated Polyethylene Drainage Tubing
   2. M 294: Corrugated Polyethylene Pipe 12- to 24-in. in Diameter

C. American Society for Testing and Materials (ASTM):
   2. B88: Standard Specification for Seamless Copper Water Tube
   6. D1785: Standard Specification for Poly (Vinyl Chloride) Plastic Pipe, Schedules 40, 80, and 120
17. F477: Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

D. American National Standard Institute (ANSI)/American Water Works Association (AWWA):
2. C105: Standard for Polyethylene Encasement for Ductile Iron Pipe Systems
6. C 151: Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water
7. C 153: Standard for Ductile-Iron Compact Fittings, 3 in. Through 24 In. (76 mm Through 610 mm) and 54 In. Through 64 In. (1,400 mm through 1,600 mm), For Water Service
8. C 220: Standard for Stainless Steel Pipe 4 inches (100 mm) and Larger (Includes Addendum C 220a-99)
10. C 605: Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
11. C 900: Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. Through 12 in. (100 mm through 300 mm), For Water Distribution
12. C 901: Standard For Polyethylene (PE) Pressure Pipe And Tubing, ½ Inch (13 mm) Through 3 Inches (76 mm) For Water Service.

E. Safety Codes Commission, Commonwealth of Virginia:

F. American National Standard Institute (ANSI)/American Society of Mechanical Engineers (ASME):
1. B 16.1: Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800
2. B 16.22: Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings

1.03 SUBMITTALS

A. General: Submittals shall be in accordance with Section .00.72.00 – General Conditions, Paragraph 7, Submittal Procedures.
B. Pipe material product data for all types used. Product data shall contain manufacturer certification of compliance with applicable ASTM, AWWA, and ANSI standards when applicable.

1.04 QUALITY ASSURANCE

A. Quality Assurance: All pipe and fittings shall be new, free from defects or contamination and shall, whenever possible, be the standard product of a single manufacturer.

B. Manufacturers Limitations: Products used in the work of this section shall be manufactured in the U.S. where possible by manufacturers regularly engaged in production of similar items.

C. All pipe and fittings shall be the diameter shown on the plans.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery, storage and handling shall be in accordance with Manufacturer’s recommendations and with the requirements of Section 01 66 00 – Product Delivery, Storage, & Handling.

B. Inspect pipe and fittings upon arrival of materials at job site.

C. Handle and store pipe materials and fittings to protect them from damage due to impact, shock, shear or free fall. Do not drag pipe and fittings along ground. Do not roll pipe unrestrained from delivery trucks.

D. Use mechanical means to move or handle pipe. Employ acceptable clamps, rope or slings around outside barrel of pipe and fittings. Do not use hooks, bars, or other devices in contact with interior surface of pipe to lift or move lined pipe.

E. Store PVC pipe out of direct sunlight.

1.06 WASHINGTON COUNTY SERVICE AUTHORITY

A. All water or sewer work under the jurisdiction or authority of Washington County shall be done in conformance with the Washington County Service Authority’s Standard Specifications, latest edition.

1. Where the WCSA’s Standard Specifications allow for options or do not provide specifications, the materials provided and work performed shall be done in accordance with these project specifications.

PART 2 PRODUCTS

2.01 PVC PIPE

A. General: Polyvinyl chloride pipe shall be made from clean, virgin, PVC compound conforming to a cell classification of 12454 as defined by ASTM D1784, and meet the following requirements:

B. Water and Pressure Pipe – lines 2” through 3 ½” diameter (ASTM D2241):

1. Water distribution pipe shall be made in accordance with ASTM D2241. Integral bells shall incorporate gaskets meeting the requirements of ASTM F477 and be locked into the bell. The assembled join shall meet the requirements of ASTM D3139. The laying length of the pipe shall be 20 feet. The pipe and gasket must be tested and approved for contact with potable water in accordance with ANSI/NSF 61. Pipe shall be Pressure Class 200 – SDR21.

C. Water Service Tubing – lines ¾” through 1 ½” diameter:

1. Pipe shall conform to ASTM D2737 and AWWA C901, pressure class 200 psi, with SODR 9 (CTS); pipe shall be listed under NSF Standard 14 for Potable Water.
D. Gravity Sewer Pipe (SDR35):
   1. Pipe shall be made in accordance with ASTM D3034 from sizes four inches through fifteen inch. The wall thickness, when testing according to ASTM D3412, shall correspond to a dimension ratio of SDR 35 with a pipe stiffness value of 46. Integral bells shall incorporate locked in gaskets meeting the requirements of ASTM D3212 and F477. The laying length of the pipe shall be 14 feet.

E. Drain, Waste, and Vent:
   1. Pipe shall be Schedule 40, Type 1, Grade 1, plain end conforming to ASTM D1784 and ASTM D1785 with solvent weld joints and fittings.
   2. Miscellaneous Pipe:
      3. Pipe for miscellaneous applications and where specified on the plans shall be Schedule 80 conforming to ASTM D1785 with solvent weld joints.

2.02 DUCTILE IRON PIPE

A. General: Ductile iron pipe (DIP) and fittings shall meet or exceed the following requirements:
   1. Pressure Class 350 in accordance with AWWA C150.
   2. Cast in accordance with AWWA C151.
   3. Cement lining in accordance with AWWA C104 except on air piping or as otherwise noted.
   4. All lines below grade shall be constructed with push-on joints and mechanical joints at fittings. Pipe lines inside of building and exterior non-buried lines shall be with flanged joints.
   5. Rubber gasket joints shall be in accordance with AWWA C111.
   6. Ductile iron pipe shall be incased in high density, cross laminated polyethylene film in accordance with AWWA C105.

2.03 POLYETHYLENE / POLYPROPYLENE PIPE (Smooth Bore Type)

A. Typical ‘corrugated plastic pipe’ with internal corrugations shall not be acceptable.

B. Standard (ST) High Density Polyethylene (HDPE) Drain Pipe:
   1. Pipe shall be solid high density polyethylene and shall meet the requirements of AASHTO M 294 Type S and of ASTM D3350 minimum cell classification. Standard HDPE pipe shall be used only for drainage applications outside of the state maintained public Right-of-Way.
   2. The pipe shall have an integrally formed smooth waterway, including a full circular cross-section, with an outer corrugated pipe wall and an essentially smoother inner wall (waterway). Manning's "n" value for use in design shall not exceed 0.012. Size shall be as indicated on the plans.
   3. Joints: Pipe shall be joined with a bell-and-spigot joint meeting the requirements of AASHTO M 294. The joint shall be watertight according to the requirements of ASTM D3212 and shall have gaskets be made of polyisoprene meeting the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. Joints shall remain watertight when subjected to a 1.5 degrees axial misalignment. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.

2.04 COPPER WATER TUBE – lines ¼" through 2"

A. Copper water tubing shall be Type K (heavy wall) soft-type for underground services. Tubing shall conform to Federal-WW-T-799, ASTM B.88, and shall be approved and listed by Underwriters Laboratory.

2.05 FOUNDATION DRAINS
A. Pipe: 4” diameter, perforated, corrugated, plastic drainage tubing, complete with ells, tees, end caps, etc., necessary for a complete installation. Pipe shall be in accordance with ASTM F405.

B. Aggregate: Crushed stone used in conjunction with foundation drains shall be in accordance with Section 33 46 00 Subdrainage.

2.06 FITTINGS

A. Polyvinyl Chloride (PVC) Fittings: Polyvinyl chloride fittings shall be made from clean, virgin, PVC compound conforming to ASTM D1784 and shall conform to the following requirements:
   1. Gravity Sewer: Fittings shall be gasketed bell type provided by the same manufacturer as the pipe and conforming to ASTM D3034-04a for SDR 35.
   2. Drain, Waste, and Vent: Fittings shall be Schedule 40 socket type conforming to ASTM D2466.
   3. Solvent Cement: Solvent cement for use on PVC pipe and fittings shall conform to ASTM F493 ASTM D2564, or ASTM D2846 as appropriate for pipe used.

B. Ductile Iron Fittings: Ductile iron fittings shall conform to AWWA C104, AWWA C110 for standard body and AWWA C153 for compact body fittings, and meet the following requirements:
   1. Buried fittings shall be mechanical joint and supplied with the proper adapter and/or transition gasket for use with PVC pipe.
   2. Flanged fittings shall be 125 pound fittings meeting ANSI/ASME B 16.42, or meeting ANSI/ASME B 16.1 for fittings not available in ductile iron.
   3. Ductile iron fittings shall be incased in high density, cross laminated polyethylene film in accordance with AWWA C105.

C. Couplings: Flexible couplings for use in joining gravity pipe of differing materials and/or sizes shall be constructed of elastomeric polyvinyl chloride conforming to ASTM C443, C1173, D5926 and secured to the connecting pipes using stainless steel screw type band clamps. Flexible couplings shall be similar to Series 1056 as manufactured by Fernco, Inc., Series 151 as manufactured by Indiana Seal, Series MR as manufactured by mission Rubber Company, or approved equal.

D. Restrained Joint Fittings: If mechanical restraining glands are used as restraining mechanisms on joints, dimensions of the glands shall be such that they can be used with the standardized mechanical joint bell and tee head bolts conforming to the requirements of AWWA C 111 and AWWA C 153.

E. High Density Polyethylene Fittings (Smooth Bore Pipe): Fittings shall conform to AASHTO M 294. Fabricated fittings shall be welded on the interior and exterior at all junctions.

PART 3 EXECUTION

3.01 EXCAVATION, BACKFILLING AND COMPACTION

A. A. General: Trench excavation and backfilling shall be in accordance with Section 31 23 33 – Trenching and Backfilling.
3.02 SEPARATION OF WATER AND SEWER LINES

A. Parallel Installation:
1. Normal conditions – Water mains shall be separated at least 10 feet horizontally from a sewer or sewer manhole. The distance shall be measured edge-to-edge.
2. Unusual conditions – When local conditions prevent a horizontal separation of 10 feet, the Contractor shall notify the Engineer. The Engineer, after consultation with the Virginia Department of Health, shall provide special instructions for construction within the area of conflict. In some cases, if authorized by the Engineer, the 10 foot separation requirement may be waived provided that:
   3. The bottom (invert) of the water main shall be at least 18 inches above the top (crown) of the sewer.
4. Where this vertical separation cannot be obtained, the sewer shall be constructed of AWWA approved water pipe, pressure tested in place to 30 psi without leakage prior to backfilling.
5. The sewer manhole shall be of watertight construction and tested in place.

B. Crossings:
1. Normal conditions – Water lines crossing over sewers shall have a separation of at least 18 inches between the bottom of the water line and the top of the sewer.
2. Unusual conditions – When local conditions prevent a vertical separation described above, the Contractor shall notify the Engineer. The Engineer, after consultation with the Virginia Department of Health, shall provide special instructions for construction within the area of conflict. In some cases, if authorized by the Engineer, the following construction shall be used:
   3. Sewers passing over or under water mains shall be constructed of AWWA approved water pipe, pressure tested in place to 50 psi without leakage prior to backfilling.
4. Water lines passing under sewers shall, in addition, be protected by providing:
   a. A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water line.
   b. Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the waterline.
   c. That the length of the water line be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer.
   d. Intersections: No water pipe shall pass through or come in contact with any part of the sewer or sewer manhole.
   e. Special Cases: In the event that existing utilities or field conditions make it impossible or impractical to meet the separation requirements, the Contractor shall notify the Architect/Engineer. The Architect/Engineer, after consultation with the Virginia Department of Health, shall provide special instructions for construction within the area of conflict.

3.03 INSTALLATION OF PIPE AND FITTINGS

A. General:
1. No valve, hydrant, or other appurtenance on existing water lines shall be opened or closed for any purpose by the Contractor. Any opening or closing of valves, hydrants, whatsoever shall be by the Owner of the utilities only. The Contractor shall notify the Owner of the utilities at least 24 hours prior to the need to open or close any appurtenance, except in emergencies, at which time the Owner of the utilities shall be notified immediately.
2. All manufactured pipes, fittings, and appurtenances shall be installed in conformance with the project specifications, all applicable state and local regulations, and in strict conformance with the manufacturer's recommendations and referenced standards.

B. Handling:
1. Pipe shall be placed in the trench in such a manner as to prevent damage to pipe and protective coatings and linings. Under no circumstances shall pipe be dropped or dumped into the trench. As the temperature approaches or drops below freezing, extra care shall be used in handling pipe.

C. Cleaning:
1. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. Spigot and bell ends of pipe and gaskets shall be cleaned and lubricated according to manufacturer's instructions. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug.

D. Cutting:
1. Pipe shall be cut in a neat and workmanlike manner without damage to the pipe. Unless otherwise authorized by the Architect/Engineer, cutting shall be done by means of approved type of mechanical cutters. Wheel cutters shall be used when practicable.

E. Direction of Laying:
1. All pipe shall be laid with bell ends facing in the direction of laying unless otherwise directed by the Architect/Engineer. Where pipe is laid on a grade of 10 percent or greater, or for gravity pipe systems, the laying shall start at bottom and shall proceed upward with the bell ends of pipe upgrade. Each piece of pipe shall be laid true to line and grade. The bottom of the trench shall be smoothly graded and bell holes provided so that the trench bottom provides uniform support to the barrel of the pipe when in final position. Adjustments to line or grade shall be made by removing or adding granular material under the barrel. In no case shall wedges or blocks be used under the body of the pipe. The pipe shall be pushed fully "home" by hand, with a bar and block of wood to cushion the bell, or other methods for large diameter pipe.

F. Bedding:
1. Bedding of pipe shall be placed to the depth shown on the plans or standard details and shall be compacted to specified density. Bedding shall be in accordance with applicable local and state standards and specifications.

G. Lateral Connections:
1. In-Line wyes and tees for cleanouts/laterals shall be installed during initial construction. When lines are required to be tapped, connections shall be made using an approved watertight saddle. Tapping into the ultra-rib pipe with the wye tapping saddle or the Fowler Inserta Tee will only be authorized to accommodate additional requirements subsequent to acceptance of project by the Owner or as explicitly authorized by the Architect/Engineer.

H. Anchorage:
1. For pipe installation at grades over 20 percent, the pipe shall be anchored in accordance with standard details.

I. Deflection at Joints:
1. Maximum deflection for force main and pressure pipe joints will be as follows:
Allowable Deflection (in inches)

<table>
<thead>
<tr>
<th>Pipe Dia.</th>
<th>Ductile Iron Lengths</th>
<th>(Push on)</th>
<th>Ductile Iron Lengths</th>
<th>(Mechanical)</th>
<th>PVC-AWWA</th>
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<tr>
<td></td>
<td>12’</td>
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<td>7.5</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

2. Flexible pipe may be curved in the trench to the limits specified in “Allowable Deflection (in inches) table above”. Do not deflect PVC pipes in joints. Joints must be secured laterally in ditch and deflection effected in the barrel of the pipe unless specific allowance by manufacturer is provided in the joint.

J. Installation of Fittings:
1. Fittings shall be installed with the same care that mainline pipe is installed. Caps or plugs shall be braced to prevent blow off during testing.

K. Jointing:
1. Mechanical Joints: When installing mechanical joint (MJ) ductile iron pipe, the socket, spigot end and rubber gasket shall be thoroughly washed with soapy water to remove any grease or grit that might damage the gasket. In making up the joint, the gland for MJ pipe followed by the gasket, shall be placed over the plain end of the pipe and inserted into the socket. The gasket shall be pushed into position without excessive force and evenly seated in the socket of the pipe bell, and the gland for MJ pipe, then moved into position against the face of the rubber gasket.

2. Flanged Joints: Where flanged joints are used, they shall be installed by skilled workmen in accordance with the best standard practice. Bolts shall be tightened so as to evenly distribute the joint stress and insure proper pipe alignment.

L. Roadway Crossings through Casings: When special conditions require use of casings, care shall be taken to maintain the proposed plan grade. Before pushing the pipe through the casing, plastic/steel collars/insulators shall be strapped to the bells to keep the pipe centered in the casing and to prevent damage when installation is made. Care shall be taken to ensure that the installed pipeline is well secured to prevent movement. See standard details.

1. All joints within casing pipe shall be restrained.
M. Installation of Tees and Laterals:
1. Tees and laterals shall be installed with the same care that mainline sewers are laid.
2. Slopes shall be not less than 1 percent unless otherwise indicated.
3. Laterals shall be the size indicated on the plans and of the same material as the main sewer pipe and shall run to locations indicated on the plans.
4. Laterals shall be properly capped and suitably sealed to prevent infiltration of water into the connections.
5. Caps or plugs shall be braced to prevent blowoff during exfiltration or air testing. Ends of laterals shall be marked and braced.
6. Couplings shall be provided as needed for ductile iron pipe connections to plastic tees.
7. Rotation of mainlines and concrete support will be required for deeper installations.
8. Cleanouts per the appropriate detail shall be provided at the terminal points. See standard details.

N. Cleanouts:
1. Piping and fittings shall be constructed of the same materials as the main line sewer and shall conform to standard details. Reconnecting to existing laterals shall be accomplished with proper water tight transition couplings as required.

O. Setting of Valves:
1. Valves shall be installed in accordance with manufacturer's instructions and shall be in accordance with Section 33 0400 - Valves and Cocks and as shown on the standard details.

P. Anchorage: Pressure pipe lines shall be protected against joint pulling or thrust damage by suitable concrete anchors, braces, tie rods or mechanical joint restraining devices installed at direction changes as a result of fittings and all other critical points.
1. Rods and clamps shall be galvanized or otherwise rust proof treated.
2. Concrete anchors shall be of the size indicated in Standard Details and shall bear on solid undisturbed earth. Stubouts and dead end lines shall be anchored in accordance with Standard Details.
3. Mechanical restraining devices shall be installed in accordance with standard details and conform to the following table or approved equal:

<table>
<thead>
<tr>
<th>Mechanical Joints</th>
<th>Ductile Iron</th>
<th>PVC C 900 or 905</th>
<th>PVC C 909 (Ultra Blue)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigma Series One-Lok</td>
<td>Sigma Series PVM</td>
<td>Sigma Series PVM</td>
<td></td>
</tr>
<tr>
<td>UniFlange 1300</td>
<td>UniFlange 1300</td>
<td>UniFlange 1300</td>
<td></td>
</tr>
<tr>
<td>UniFlange 1400</td>
<td>UniFlange 1300</td>
<td>UniFlange 1300</td>
<td></td>
</tr>
<tr>
<td>Romac Industries 612</td>
<td>Romac Industries 612</td>
<td>Romac Industries 612</td>
<td></td>
</tr>
<tr>
<td>Push-On Joints</td>
<td>Megalug Series 1700</td>
<td>Megalug Series 1600/2800</td>
<td>Megalug Series 1600/2800</td>
</tr>
<tr>
<td>Sigma Series SLDH</td>
<td>Sigma Series PVP</td>
<td>Sigma Series PVP</td>
<td></td>
</tr>
<tr>
<td>UniFlange 1390</td>
<td>UniFlange 1350</td>
<td>UniFlange 1350</td>
<td></td>
</tr>
<tr>
<td>UniFlange 1450</td>
<td>Romac Industries 611</td>
<td>Romac Industries 611</td>
<td></td>
</tr>
<tr>
<td>Romac Industries 611</td>
<td>Romac Industries 611</td>
<td>Romac Industries 611</td>
<td></td>
</tr>
</tbody>
</table>
**Restrains manufactured by Romac Industries are not acceptable for use on PVC C 909 (Ultra Blue) Pipe.**

### 3.04 PIPELINE TESTING

A. General: Testing of pipe lines and structures shall be at the Contractor’s expense. Any defects or leaks shall be repaired or replaced at the Contractor’s expense. Test results shall be provided to Engineer in accordance with Section 01 33 00 – Submittal Procedures.

B. Pressure Testing:

1. Test Section: Pressure and leakage testing shall be conducted on each valved section (between adjacent valves) of pressure pipeline. Force mains and other pressure pipe without valves shall be tested in sections not to exceed 5,000 feet.

2. Procedures: Pressurization, air removal, and allowances shall be in accordance with AWWA C 600, Section 5 or AWWA C 605, Section 7 as appropriate for pipe used. Testing shall begin on the first valved section of line within ten days after its completion. The pressure and leakage tests shall be conducted concurrently for a duration of two hours. Water main testing through fire hydrants shall not be permitted. The valved section of the pipe under consideration shall be slowly filled with water and brought to the specified pressure by means of a pump. Before supplying the specified test pressure, all air shall be expelled from the pipe. Testing shall not begin until at least seven days after the last concrete anchor has been poured on the section of line being tested (if high early concrete is used, two days). The Engineer or Owner’s representative shall observe all leakage tests. If the pipe fails to meet test requirements, all leaks shall be repaired and defective pipe replaced at the Contractor’s expense. The test shall be repeated until satisfactory results are obtained. The Contractor shall be charged for all retests at the normal rates for inspection services.

3. Test Pressures: Test pressure shall be 150 psi as measured at the lowest point in that test section, unless otherwise noted. For test pressures less than 200 psi, Contractor shall demonstrate that there is no significant pressure (other than static) in the adjacent sections of pipeline to the one being tested.

4. Leakage: Leakage shall be defined as the quantity of water that must be supplied into the valved pipe section to maintain pressure within 5 psi of the specified test pressure. The allowable leakage shall not exceed the values given in table labeled Allowable Leakage per 1,000 Feet of Pipeline included at the end of this section.

#### Allowable Leakage Per 1,000 Feet (305 m) of Pipeline* - gph (multiply by 2 for 2 hour test)

<table>
<thead>
<tr>
<th>Avg. Test Pressure</th>
<th>Pipe Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>300</td>
<td>0.39</td>
</tr>
<tr>
<td>275</td>
<td>0.37</td>
</tr>
<tr>
<td>250</td>
<td>0.36</td>
</tr>
<tr>
<td>225</td>
<td>0.34</td>
</tr>
</tbody>
</table>
C. Gravity Sewer Testing: All gravity sewer lines (except storm sewer) shall be tested by any or all of the following methods for both displacement or structural faults and for watertightness by the Contractor. The testing methods shall be at the option of the Inspector. The Contractor shall make all preparations and shall supply the labor for all tests. The Contractor shall supply specialized equipment, such as T.V. cameras for the conduction of such tests. No charge shall be made for initial witnessing of tests, but each succeeding test required on the same section of line caused by failure of the tests shall be charged to the Contractor.

1. Pipe Displacement Testing - Lights: A light will be flashed between manholes by means of a flashlight or by reflecting sunlight with a mirror. If the illuminated interior of the pipeline shows visible leaks, poor alignment, displaced pipe or any other defects, they will be remedied by the Contractor at the Contractor's expense.

2. Pipe Displacement and Structural Testing - T.V.: A T.V. camera to be supplied by the Contractor may be used to locate defects in the pipeline. These shall then be remedied by the Contractor at the Contractor’s expense.

3. Pipe Deflection Testing: Pipe may be measured for vertical ring deflection after completion of the backfill. Maximum ring deflection of the pipe under load shall be limited to 5.0 percent of the vertical internal pipe diameter. Testing shall be accomplished by recording deflectometer or by approved mandrel, sphere, or pin type go/no-go device. Such equipment shall be furnished by the Contractor.

4. Pipe Infiltration Testing: When, in the opinion of the Architect/Engineer, the trench or excavation is sufficiently (4 foot above crown) saturated as a result of ground water or rain, tests may be made on the basis of infiltration. The Contractor shall carefully measure the flow of water at the nearest downgrade manhole. The necessary supply of water, plugs, labor and equipment shall be furnished by the Contractor at his expense. Three series of measurements shall be made at not less than 1 hour intervals, and the results shall be reduced to an average. This average shall then be computed so as to apply for the 24-hour period. All such tests shall be made only under the supervision of the Project Representative. All defective work shall be immediately repaired and retested until proven to be satisfactory. Infiltration shall not exceed a rate of 100 gallons per inch of pipe diameter per mile per day for any section of the system.

5. Pipe Exfiltration Testing: When conditions are not suitable for making infiltration tests, an exfiltration test may be made. The line to be tested shall be filled so that a head of at least 4 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be re-established. The amount of water required to maintain this water level during a 2 hour test period shall be measured. Leakage measured by this test shall not exceed 100 gallons per inch diameter per mile of pipeline per day. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished.
6. Pipe Air Testing: Air Testing shall be conducted in accordance with ASTM F1417 and as summarized below.
   a. Clean pipe to be tested by propelling snug-fitting inflated rubber ball through the pipe with water if necessary.
   b. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
   c. If the pipe to be tested is submerged in ground water, insert a pipe probe by boring or jetting into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.
   d. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig.
   e. After an internal pressure of 4.0 psig is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
   f. After stabilizing the internal pressure at 4.0 psig, reduce the internal air pressure to 3.5 psig, and start stopwatch. Determine the time in minutes and seconds that is required for the internal air pressure to reach 2.5 psig. Minimum permissible pressure holding times for runs of single pipe diameter and for systems of 4 inch, 6 inch, or 8 inch laterals in combination with trunk lines are indicated in minutes and seconds in the table shown.
   g. NOTE: The air test may be dangerous if, because of ignorance or carelessness, a line is improperly prepared. It is extremely important that the various plugs be installed and braced in such a way as to prevent blowouts. In as much as a force of 250 pounds is exerted on an 8 inch plug by an internal pipe pressure of 5 psi, it should be realized that sudden expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be dangerous. As a safety precaution, pressurizing equipment should include a regulator set at perhaps 10 psi to avoid over pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing. The pressure gauge used during the test shall be located completely outside of manhole.

3.05 DISINFECTION
   A. Disinfecting Water Mains: Water mains and accessories shall be disinfected using the “continuous-feed” or “slug method” in accordance with ANSI/AWWA C651. The “Tablet Method” described in ANSI/AWWA C651 shall not be used. The successful bidder shall obtain the most recent applicable AWWA standard. This standard shall be at jobsite with access granted to Owner’s representative and Engineer. Care shall be taken to minimize entrance of foreign material into pipe, fittings and valves. The main shall be flushed prior to disinfection with sufficient flow to produce a velocity of 10 fps. Flushing shall take place in areas with adequate drainage.
      1. Final flushing shall follow to ensure that the chlorine concentration is not higher than that generally prevailing in the system. Chlorinated water shall not be discharged to any water course or drainage way until it is diluted or reduced to a level which will result in no damage to aquatic life.
   B. A chlorine application by an approved method shall be made using water from the existing distribution system or water supply. The initial chlorine concentration in the water to be used shall be a minimum of 50 mg/l available chlorine. The chlorinated water shall be retained in the main for at least 24 hours, but not more than 72 hours during which time all valves and hydrants in the section treated shall be operated. At the end of this period, the treated water...
shall contain no less than 25 mg/l chlorine throughout, and final flushing shall follow to ensure that the chlorine concentration is not higher than that generally prevailing in the system. Chlorinated water shall not be discharged to any water course or drainageway until it is diluted or reduced to a level which will result in no damage to aquatic life.

C. Bacteriological Tests: After final flushing and before the water main is placed in service, 2 consecutive samples shall be collected at 24 hours intervals for each 1,200 feet (366 m) of the new water main, plus one set from the end of the line and at least one set from each branch. These samples shall be tested for bacteriological quality by the State Laboratory or other certified laboratory and shall show the absence of coliform organisms. Samples will be collected (through the use of sample taps supplied by the Contractor) and delivered to the Testing Laboratory by the Owner within 48 hours of written notifications from Contractor. The Owner’s representative shall witness the collection of samples. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. The Contractor is responsible for the cost of all tests.

END OF SECTION 33.03.00
PART 1  GENERAL

1.01 DESCRIPTION

A. Work Included: Provide complete, in place, and free from leakage, all valves as shown on the plans and in accordance with this Specification. Valves shall be furnished complete with valve operators and accessories necessary for a complete assembly adequate for the specified or indicated purpose. Valve assemblies shall be installed, painted, tested and adjusted.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 01 30 00 – Product Delivery, Storage, and Handling Requirements
   3. Section 33 03 00 - Utility Pipe and Materials

1.02 REFERENCES

A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

B. American National Standard Institute (ANSI):

C. American National Standard Institute (ANSI)/American Society of Sanitary Engineers (ASME):
   1. B16.1: Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800
   2. B16.5: Pipe Flanges and Flanged Fittings

D. American National Standard Institute (ANSI)/American Society of Sanitary Engineers (ASSE):
   1. 1011: Hose Connection Vacuum Breakers
   2. 1013: Reduced Pressure Principle Backflow Preventers

E. American National Standard Institute (ANSI)/American Water Work Association (AWWA):
   2. C500: Standard for Metal Seated Gate Valves for Water Supply Service
   3. C800: Standard for Underground Service Line Valves and Fittings

F. American Society for Testing and Material (ASTM):

1.03 SYSTEM DESCRIPTION

A. General: Valves shall be non-rising stem, with handwheel, lever, nut, or hydraulic operator, as shown on the Plans and specified herein.

1.04 SUBMITTALS

A. General: Shall be in accordance with Section 01 33 00 – Submittal Procedures. Each submittal shall be identified with precise, use, line and location.

B. Shop Drawings shall be submitted in accordance with Section 01

C. Maintenance Instructions: Submit corrective and preventive maintenance instructions, including recommended spare parts.
1.05 DELIVERY, STORAGE AND HANDLING

A. General: Shall be in accordance with Section 01 66 00 – Product Delivery, Storage, and Handling Requirements.

B. Delivery: Deliver valves to the job site packaged, tagged, and marked.

C. Storage: Store valves at the job site in a manner to prevent damage and accumulation of dirt and rust.

1.06 WASHINGTON COUNTY SERVICE AUTHORITY

A. All water or sewer work under the jurisdiction or authority of Washington County shall be done in conformance with the Washington County Service Authority’s Standard Specifications, latest edition.

1. Where the WCSA’s Standard Specifications allow for options or do not provide specifications, the materials provided and work performed shall be done in accordance with these project specifications.

PART 2 PRODUCTS

2.01 TAPPING SLEEVE AND VALVE

A. Complete assembly, including tapping sleeve, tapping valve, and bolts and nuts. Use sleeve and valve compatible with tapping machine.

B. Tapping Sleeve: Cast or ductile-iron, 2-piece bolted sleeve with flanged outlet for new branch connection. Sleeve may have mechanical-joint ends with rubber gaskets or sealing rings in sleeve body. Include sleeve matching size and type of pipe material being tapped and of outlet flange required for branch connection.

C. Indicator Posts: Shall be UL Listed and FM Approved. Bodies of indicator posts shall be constructed of ductile iron or cast iron. The color of the indicator post above ground grade shall be red. The stem, indicators, and all working parts are to be fully enclosed to prevent moisture and weather damage. Target plates shall be aluminum construction and shall have the words “OPEN” and “SHUT” cast in large, easy-to-read raised letters. The target plates shall be located behind two sight windows fitted with heavy clear glass or plexiglass, and the appropriate word shall appear as the valve is operated. The indicator post shall be equipped with a compatible electronic supervisory switch which monitors the opening and closing of the valve. The indicator posts shall be equal to those manufactured by Mueller, Kennedy, or Clow. Indicator posts shall be supplied with a corresponding resilient wedge gate valve by the same manufacturer.

2.02 VALVE BOXES

A. Boxes shall be furnished and installed for all valves buried in the earth. The valve boxes shall be a 3-piece screw type in accordance with Standard Details, with 5 ¼ inch shaft similar to buffalo type by Bingham and Taylor. Base shall be of sufficient size and configuration to support the box without resting on the pipe or valve. The word “water” shall be cast on the box lid in letters not less than 1 inch high on all water valves.

2.03 MISCELLANEOUS VALVES

A. Corporation Stop: Shall be 3/4 inch unless otherwise indicated with inlet threads conforming to ANSI/AWWA C800, commonly known as the “Mueller” thread, and an outlet compatible with the service pipe and shall be Mueller #H-15000 for copper outlet or approved equal.
B. Supply Stop Valves: Stop valves shall be angle type polished chrome plated shut-off stops with inlet end threaded and outlet end compression fitting to match fixture fittings.

C. Hose Bibb: Assembly shall be anti-contamination wall faucet. Valve shall be furnished with approved vacuum breaker which complies with ANSI/ASSE 1011 and has 3/4 inch male hose threads. Valve shall be of brass construction with adjustable packing nut and deep stem guard, Teflon impregnated packing and standard “O” size washer and wheel handle. Inlet shall be 1/2 inch copper tube.

D. Reduced Pressure Zone Backflow Preventer Assembly (RPZ): shall consist of two independent check valves, relief port, four test ports, and an in-line strainer. The body of the unit shall be bronze construction and shall be supplied with ball type shutoff valves. The units shall be Hersey Model FRPII (3/4 inch - 2 inch) or approved equal. Units shall conform with ASSE 1013.

PART 3 EXECUTION

3.01 INSPECTION

A. General: Examine the areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to proper and timely completion of work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION - ALL VALVES

A. General: Valve installation shall comply with Standard Details and the Manufacturer's recommendations. No valve, hydrant, or other appurtenance on existing water lines shall be opened or closed for any purpose by the Contractor. Any opening or closing of valves, hydrants, whatsoever shall be by the Owner of the utilities only. The Contractor shall notify the Owner of the utilities at least 24 hours prior to the need to open or close any appurtenance, except in emergencies, at which time the Owner of the utilities shall be notified immediately.

B. Stems: Shall be oriented for accessibility as approved by the Owner’s representative. Do not install valves with stems in the downward direction.

C. Setting of Valves: A valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished grade or as directed by the Architect/Engineer. Valves boxes shall be installed in accordance with the Standard Details.

D. Transmitting Forces: Valves and valve boxes shall be installed so no forces are transmitted to the valve through the piping or valve boxes.

E. Cleaning: All valves and appurtenances shall be flushed clear of all foreign material after installation.

F. Testing: Field test all valves and appurtenances for proper operation, proper adjustments and settings, freedom from vibration, binding, scrapings, and other defects. Check all valve supports for strength and high quality workmanship. All defects shall be corrected to the satisfaction of the Owner’s Representative. Hydrostatic and leakage tests shall be in accordance with Section 33 03 00 - Utility Pipe and Materials.

END OF SECTION 33.04.00
SECTION 33.05.00
COMMON WORK RESULTS FOR UTILITIES

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: The work in this section shall include the furnishing, installation, and testing of all utility appurtenances and furnishing the equipment, labor, and appurtenances for the installation of utility appurtenances.

B. Related Sections: Additional sections of the documents which are referenced in this section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 31.23.33 – Trenching and Backfilling
   3. Section 33.04.00 – Valves and cocks

1.02 REFERENCES

A. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.

B. American Association of State Highway and Transportation Officials Publications (AASHTO):
   1. M198 Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible watertight Gaskets.
   2. Section 16 Steel Tunnel Liner Plates Standard Specifications for Highway Bridges.

C. American Society for Testing and Materials (ASTM):
   3. A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
   4. A307 Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile
   5. A449 Standard Specifications for Hex Cap Screws, Bolts and Studs, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
   9. C478 Standard Specification for Precast Reinforced Concrete Manhole Sections
   10. C1244 Standard Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test Prior to Backfill
   11. D3034 Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings

D. American Water Works Association (AWWA):
   1. C700 Cold-Water Meters-Displacement Type, Bronze Main Case

E. ANSI/ASME:
   1. A112.21.1 Floor Drains

F. Virginia Department of Transportation - Road and Bridge Specifications (VDOT):
   1. 217 Hydraulic Cement Concrete
   2. 302 Drainage Structures

1.03 QUALITY ASSURANCE
A. Quality Assurance: All utility appurtenances shall be new, free from defects or contamination and shall, whenever possible, be the standard product of a single manufacturer.

B. Manufacturers Limitations: Products used in the work of this section shall be manufactured in the U.S. where possible by manufacturers regularly engaged in production of similar items.

1.04 SUBMITTALS

A. General: Submittals shall be in accordance with Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures.

1.05 WASHINGTON COUNTY SERVICE AUTHORITY

A. All water or sewer work under the jurisdiction or authority of Washington County shall be done in conformance with the Washington County Service Authority’s Standard Specifications, latest edition.

1. Where the WCSA’s Standard Specifications allow for options or do not provide specifications, the materials provided and work performed shall be done in accordance with these project specifications.

PART 2 PRODUCTS

2.01 SERVICE METERS AND EQUIPMENT

A. A. Service Meters: Service meters shall be frost-proof 1 inch x 3/4 inch disc meters conforming to AWWA C700. The meter shall have internal strainer and hermetically sealed non-fogging standard registers operated by magnetic drive and flow units in U.S. gallons. The measuring chamber shall be bronze with bottom freeze-out cap or plug. Service meters shall be Sensus or approved equal, with provisions for adding “Touch Read” capability at a later date.

B. Coppersetter: Coppersetters for meter settings (1 inch x 3/4 inch) shall have key type inlet valve and dual angle check on outlet piping shall be included. Coppersetters valve shall be of the tandem type to allow the pressure regulator to be installed ahead of the meter. These shall be Ford 70 series units or approved equal, with 12 inch height, for use with copper service pipe.

C. Meter Box: Each meter shall be installed in a concrete 24 inch meter box conforming to the Standard Details.

D. Meter Box Cover: Each meter box shall be equipped with a cast iron frame and cover, 11-1/2 inch lid opening, 18 inch I.D. with extension ring as required, with standard pentagon bolt and lifter worm lock. Overlapping style similar to Ford X32 shall be used in lawn areas. Inset lids similar to Ford A32 shall be used in sidewalk or pavement areas.

E. Multiple Meter Box: The meter box shall be 36 inch corrugated metal pipe conforming to Standard Details. The meter box shall be equipped with cast iron 20 inch x 36 inch frame and cover. The frame and cover specified above may be used in conjunction with an extension ring similar to Ford EXT-5.

2.02 MISCELLANEOUS DEVICES

A. Sample Tap Assembly: The sample tap shall be equipped with an aluminum cover with padlock provision, ¾ inch hose connection, vent tube, brass interior pipe, galvanized riser pipe and brass interior pipe, galvanized riser pipe and brass valve body. The sample tap shall be the Eclipse No. 88, Gil Industries No. EH 101, or approved equal.]
B. Hose Bibs: Shall be single faucet, compression valve, tee handle, 1/2 inch male thread inlet, hose connection spigot with vacuum breaker, polished chrome finish similar to American Standard 4224.028.

C. Floor Drains: Drains shall conform to ANSI/ASME A112.21.1. Floor drains shall be coated cast iron with double drainage flange, weepholes, threaded outlet connection, integral bell trap, and adjustable polished nickel alloy round removable strainer. Strainer shall be 6 inches in diameter and shall be made with light duty grate in buildings except in traffic areas where medium duty shall be used.

D. Pipe Repair Clamps: Shall be of stainless steel, type 304 with pre-assembled bolting mechanism. Clamps shall be Style FS2 or FS3 as manufactured by the Ford Meter Box Company, Inc., Series 520 or 530 Full Seal as manufactured by the Mueller Co., Style CL, SL or SS as manufactured by Romac Industries, Inc. or approved equal.

E. Saddles: Saddles shall be made of a malleable material and have flat stainless steel straps. Rubber gaskets shall be required for all pipe sizes and classes. Lead gaskets will not be allowed. Saddles shall provide full support around the circumference of the pipe and have a bearing area of sufficient width along the axis of the pipe 1-1/2 inch minimum. Saddles shall not have lugs that will dig into the pipe when the saddle is tightened. The U-bolt type strap will not be allowed. Saddles shall be Ford FS 202, Mueller DE2S SERIES, Romac Style 202S or approved equal.

PART 3 EXECUTION

3.01 EXCAVATION, BACKFILLING AND COMPACTION

A. General: Trench excavation shall be in accordance with Section 31 23 33 – Trenching and Backfilling.

3.02 INSTALLATION OF UTILITY APPURTENANCES

A. Setting of Valves: Valves shall be installed in accordance with manufacturer's instructions and shall be in accordance with Section 33 04 00 - Valves and Cocks and as shown on the Standard Details.

B. Meters: Service meters shall be installed per Standard Detail SC-6, with pressure regulator installed in meter box. Connection to existing service line shall be made. All service taps shall be made under normal working pressure only after water main is tested and disinfected.

C. Installation of Pipe Supports: Exposed piping inside of building shall be supported both horizontally and vertically such that forces are transmitted to the supports and sagging is eliminated.

END OF SECTION 33.05.00
SECTION 33.05.13
MANHOLES AND STRUCTURES

PART 1 GENERAL

1.01 DESCRIPTION
A. Work Included: The work in this section shall include the furnishing, installation, and testing of all utility appurtenances and furnishing the equipment, labor, and appurtenances for the installation of utility appurtenances.

B. Related Sections: Additional sections of the documents which are referenced in this section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 31.23.33 – Trenching and Backfilling
   3. Section 33.03.00 – Utility Pipe and Materials
   4. Section 33.04.00 – Valves and Cocks

1.02 REFERENCES
A. General: The Work shall comply with the most recent or tentative standards as published at the date of the Contract and as listed in the Specifications using abbreviations shown.

B. American Association of State Highway and Transportation Officials Publications (AASHTO):
   1. M198: Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible watertight Gaskets.
   2. Section 16: Steel Tunnel Liner Plates Standard Specifications for Highway Bridges.

C. American Society for Testing and Materials (ASTM):
   4. A307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile
   5. A449: Standard Specification for Quenched and Tempered Steel Bolts and Studs
   14. C1244: Standard Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test Prior to Backfill
D. Virginia Department of Transportation - Road and Bridge Specifications (VDOT):
   1. 217: Hydraulic Cement Concrete
   2. 232: Pipe and Pipe Arches
   3. 302: Drainage Structures

E. Virginia Department of Transportation – Road and Bridge Standards, Latest Edition

F. American Association of State Highway and Transportation Officials (AASHTO)
   1. M105
   2. M199

1.03 QUALITY ASSURANCE

A. Quality Assurance: All utility appurtenances shall be new, free from defects or contamination and shall, whenever possible, be the standard product of a single manufacturer.

B. Manufacturers Limitations: Products used in the work of this section shall be manufactured in the U.S. where possible by manufacturers regularly engaged in production of similar items.

1.04 SUBMITTALS

A. General: Submittals shall be in accordance with Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures.

B. Shop drawings:
   1. Manhole sections
   2. Base units and construction details, including reinforcement, jointing methods, materials and dimensions
   3. Frames, grates, rings, and covers
   4. Materials to be used in fabricating drop connections
   5. Materials to be used for pipe connections at manhole walls
   6. Materials to be used for stubs and stub plugs, if required
   7. Materials and procedures for corrosion-resistant liner and coatings, if required.
   8. Plugs to be used for sanitary sewer hydrostatic testing
   9. Manufacturer’s data for pre-mix (bag) concrete, if used for channel inverts and benches

PART 2 PRODUCTS

2.01 PRECAST CONCRETE MANHOLES

A. General: Concrete manholes shall be of precast construction. All concrete shall be rodded or vibrated to minimize honeycombing and assure watertightness. Items delivered and installed at the site shall be structurally sound and free from cracks or major surface blemishes.

B. Construction:
   1. Precast manholes shall conform to ASTM C478 and as called for on the plans. Drop manholes where required shall be constructed in accordance with Standard Details.
   2. The eccentric design manhole shall be used, except as shown on the plans.
   3. Provide base riser section with integral floors, unless shown otherwise.
   4. Provide interlocking adjustment rings which are standard components of manufacturer of manhole sections.
   5. Minimum inside diameter shall be 48 inches unless noted on plans, with minimum of 5 inch thick walls. All manholes shall have monolithic bases except as shown on the plans.

C. Manhole Steps:
   1. Steps shall be plastic coated with steel reinforcement.
2. Steps shall comply with ASTM C478, AASHTO M-199, and OSHA Instruction Standard 1-1.9.
3. Steps shall be on 16 inch minimum centers and conform to Standard Details.

D. Sanitary Sewer Pipe Connections
1. Provide resilient connectors conforming to requirements of ASTM C 923. Use the following materials for metallic mechanical devices as defined in ASTM C 923:
   a. External clamps: Type 304 stainless steel
   b. Internal, expandable clamps on standard manholes: Type 304 stainless steel, 11 gauge minimum.
   c. Internal, expandable clamps on corrosion-resistant manholes:
      (1) Type 316 stainless steel, 11-gauge minimum
      (2) Type 304 stainless steel, 11-gauge minimum, coated with minimum 16 mil fusion-bonded epoxy conforming to AWWA C 213

E. Storm Drain Pipe Connections
1. Provision for indicated storm drainage pipe connections shall be made by means approved in VDOT 302.
2. Existing lines shall be grouted into place.
3. The storm drain pipe shall be connected to the manhole base section with an approved flexible water-tight sleeve or gasket (similar to the New Lock Joint Flexible Manhole Sleeve as manufactured by the Interpace Corporation or the Z:LOK Manhole Pipe Connector as manufactured by A:LOK PRODUCTS INC.). The A:LOK Manhole Pipe Seal as manufactured by A:LOK CORP will not be an acceptable product for this purpose.

F. Frames and Covers: Frames and covers shall be of cast iron conforming to ASTM A48 for Class 30 Gray Iron and AASHTO M105, and shall meet the requirements of Standard Details. All structures located within travelways shall receive traffic bearing tops.

G. Concrete: Concrete used for shaping of manholes, channels, sidewalk, and miscellaneous work shall meet requirements of VDOT Section 217 type A3.

H. Joints: Joints shall be sealed with two rings of butyl rubber rope conforming to AASHTO M198, Type B.

2.02 MISCELLANEOUS DEVICES
A. Pipe Repair Clamps: Shall be of stainless steel, type 304 with pre-assembled bolting mechanism. Clamps shall be Style FS2 or FS3 as manufactured by the Ford Meter Box Company, Inc., Series 520 or 530 Full Seal as manufactured by the Mueller Co., Style CL, SL or SS as manufactured by Romac Industries, Inc. or approved equal.

B. Sleeves and Inserts: Shall be provided and correctly located in the structure, as required for the work. Inserts shall be steel and of proper size for loads encountered.
1. Sleeves shall be provided for all exterior utility pipes passing through concrete or masonry walls. Sleeves through existing concrete walls and slabs may be omitted if wall or slab can be core drilled and properly sealed in a manner acceptable to the Engineer. Sleeves placed horizontally in walls shall be standard weight ASTM A53 steel pipe of length equal to thickness of wall or beam. All sleeves (and core drilled openings) shall be of sufficient diameter to clear bare or covered pipes by 1/4” all around except sleeves on lines subject to movement by expansion which shall clear the bare pipe or insulation on insulated pipe at least one inch all around. Pipes through exterior walls below grade shall have modular mechanical type seals consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve. Sleeve shall have
anchor and water stop plate. The entire assembly shall be tightened and adjusted and made watertight.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that lines and grades are correct.
B. Determine if sub grade, when scarified and recompacted, can be compacted to 95 percent of maxi-mum Standard Proctor Density according to ASTM D 698 prior to placement of foundation material and base section. When proper density is not reached, moisture condition sub grade until that density is reached or treat as unstable sub grade.
C. Do not build manholes in ditches, swales, or drainage paths unless approved by Engineer.

3.02 PLACEMENT

A. Install precast manholes to conform to locations and dimensions shown on Drawings.
B. Place sanitary and storm manholes at points of change in alignment, grade, size, pipe intersections, and end of sewer.

3.03 EXCAVATION, BACKFILLING AND COMPACTION

A. General: Trench excavation and Backfilling shall be in accordance with Section 31 23 33 – Trenching and Backfilling.

END OF SECTION 33.05.13
SECTION 33.10.00
WATER UTILITIES

PART 1  GENERAL

1.01  DESCRIPTION
   A. Work Included: Furnish all labor, materials, tools, transportation, supplies, equipment, testing, and disinfection of the water main shown on the plans.
   B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
      1. Section 33.03.00 - Utility Pipe and Materials
      2. Section 33.04.00 - Valves and Cocks

1.02  REFERENCES
   A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
   B. American National Standards Institute (ANSI)/American Water Works Association (AWWA):
      1. C651: Standard for Disinfecting Water Mains

1.03  QUALITY ASSURANCE
   A. Contractor Responsibilities: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

1.04  WASHINGTON COUNTY SERVICE AUTHORITY
   A. All water or sewer work under the jurisdiction or authority of Washington County shall be done in conformance with the Washington County Service Authority’s Standard Specifications, latest edition.
      1. Where the WCSA’s Standard Specifications allow for options or do not provide specifications, the materials provided and work performed shall be done in accordance with these project specifications.

PART 2  PRODUCTS

2.01  MATERIALS
   A. Local Regulations or Standards: Contractor is responsible for confirming the jurisdiction of any local authority that may have local regulations or standards pertaining to the work herein; where there is conflict between the project specifications and the local standards, Contractor shall conform to the more stringent standards.
   B. Pipe and Fittings, Joints, and Coating: All materials shall be in accordance with the Section 33.03.00 - Utility Pipe and Materials; water pipe shall be PVC, Ductile Iron, or Copper, as indicated on the plans or in accordance with the size.
   C. Valves: All valves shall be in accordance with Section 33.04.00 - Valves and Cocks.
   D. Concrete: Miscellaneous concrete shall be VDOT Type A-3 specifications.
E. Tie Rods: ¾ inch thread steel rods for hydrant clamping shall be galvanized or otherwise rustproof treated. Compatible tie bolts and nut or clamps shall be similarly rustproof treated.

F. Heated, Fiberglass, Above-Grade Enclosure (Hot Box):
   1. The enclosure, certified to ASSE 1060, shall be of min. 1/8" tk. thixotropic polyester resin reinforced with fiberglass strand. Molded exteriors will be a smooth, yacht quality finish, protected w/UV inhibited isophthalic polyester gel coat. Non-molded products will utilize an “industrial” exterior texture, with the same gel coated finish. Enclosure shall utilize a lockable flip top design, for maintenance access through lid without removal of the entire unit. Molded product shall utilize an overlapping lid seam design for weather proofing and vandal resistance.
   2. Insulation shall be min. 1-1/4" tk. (R8), unicellular, non-wicking, polyisocyanate foam.
   3. Drains shall be sized for full port backflow discharge and designed for “one way” exit, inhibiting intrusion of debris and/or vermin.
   4. Enclosure shall be anchored to a concrete slab or GLASSPAD™ from within the enclosure w/steel anchors and require a single lock for security purposes.
   5. Heat will protect the piping and equipment from exterior temperatures to -30°F and be thermostatically controlled. UL or ETL listed self-regulating cable(s) or wall mounted air heater(s) will be sized to maintain the equipment at +40°F, in accordance with N.F.P.A. 3-3.1.8 & 3-6.1.3.2. Heat source shall be mounted a minimum of 7" above the slab unless it is UL or ETL certified and NEC approved for submersion. Power source shall be installed inside the enclosure by others, protected with a ground fault interrupting receptacle (GFI) or GFI circuit – ref. UL 943, N.E.M.A.3R.

PART 3 EXECUTION

3.01 INSTALLATION OF PIPE, FITTINGS AND ACCESSORIES
   A. Pipe and Fitting Installation: All work shall be in accordance with Section 33.03.00 - Utility Pipe and Materials.
   B. Valve Installation: All work shall be in accordance with Section 33.04.00 - Valves and Cocks.

3.02 SERVICE CONNECTIONS
   A. General: All service taps for connecting service lines shall be made under pressure with proper tapping machine for the pipe being tapped. The water main shall be tested and disinfected before service taps are made.

END OF SECTION 33.10.00
SECTION 33.30.00
SANITARY SEWERAGE UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work Included: Furnish all labor, materials, tools, transportation, supplies, plant equipment, and appurtenances necessary for the complete and satisfactory construction of the sanitary sewer as shown on the plans, completed and ready for service.

B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 31.23.33 – Trenching and Backfilling
   3. Section 33.03.00 - Utility Pipe and Materials
   4. Section 33.05.13 – Manholes and Structures
   5. Section 33.04.00 - Valves and Cocks

1.02 REFERENCES

A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.


1.03 SUBMITTALS

A. All submittals shall be in accordance with Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures.

B. Provide shop drawings for all products used in accordance with Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures.

C. Testing reports as required in Section 33.03.00 – Utility Pipe and Materials and Section 33.05.13 – Manholes and Structures.

1.04 WASHINGTON COUNTY SERVICE AUTHORITY

A. All water or sewer work under the jurisdiction or authority of Washington County shall be done in conformance with the Washington County Service Authority’s Standard Specifications, latest edition.
   1. Where the WCSA’s Standard Specifications allow for options or do not provide specifications, the materials provided and work performed shall be done in accordance with these project specifications.

PART 2 PRODUCTS

2.01 GRAVITY SEWER

A. Local Regulations or Standards: Contractor is responsible for confirming the jurisdiction of any local authority that may have local regulations or standards pertaining to the work herein; where there is conflict between the project specifications and the local standards, Contractor shall conform to the more stringent standards.
B. General: Gravity sewer pipe shall be PVC or ductile iron pipe, in accordance with Section 33.03.00 – Utility Pipe and Materials at the Contractor’s option except where specified otherwise in Section 33.03.00 – Utility Pipe and Materials or on the plans. Tees, wyes, or other miscellaneous fit-tings shall be of the same material and type as the gravity sewer pipe provided, in accordance with Section 33.03.00 – Utility Pipe and Materials. No other materials may be used for sanitary sewer piping.

2.02 MARKING TAPE
A. General: Marking tape shall be required on all pipe lines including sanitary sewer mains. Detectable mylar marking tape shall be as specified in Section 31.23.33 – Trenching and Backfilling.

PART 3 EXECUTION

3.01 PREPARATION
A. Prepare traffic control plans and set up street detours and barricades in preparation for excavation when construction will affect traffic. Conform to requirements of Section 01 55 26 - Traffic Control and Regulation.
B. Perform work in accordance with applicable OSHA standards. Employ trench safety systems as required.
C. Immediately notify agency or company owning utility line, which is damaged, broken or disturbed. Obtain approval from agency or utility company for repairs or relocations, either temporary or permanent.
D. Do not allow sand, debris or runoff to enter sewer system.

3.02 DIVERSION PUMPING
A. Install and operate required bulkheads, plugs, piping, and diversion pumping equipment to maintain sewage flow and to prevent backup or overflow. Obtain approval for diversion pumping equipment and procedures from governing authority.
B. Design piping, joints and accessories to withstand twice maximum system pressure or 50 psi, whichever is greater.
C. No sewage shall be diverted into area outside of sanitary sewer.
D. In event of accidental spill or overflow, immediately stop overflow and take action to clean up and disinfect spillage. Promptly notify Engineer so that required reporting can be made to DEQ and Environmental Protection Agency by Engineer.

3.03 EXCAVATION
A. Line and Grade. Establish required uniform line and grade in trench from benchmarks identified by Engineer. Maintain this control for minimum of 100 feet behind and ahead of pipe-laying operation. Use laser beam equipment to establish and maintain proper line and grade of work. Use of appropriately sized grade boards, which are substantially supported, is also acceptable. Protect boards and location stakes from damage or dislocation.
B. Trench Excavation. Excavate pipe trenches to depths shown on Drawings and as specified in Section 31.23.33 – Trenching and Backfilling.

3.04 SEPARATION OF WATER AND SEWER LINES
A. General: Sanitary sewer shall be separated from water lines in accordance with Section 33.03.00 – Utility Pipe and Materials.

3.05 INSTALLATION OF PIPE, FITTINGS, AND PRECAST STRUCTURES
A. General: Installation and testing of pipe, fittings, and appurtenances shall be in accordance with Section 33.03.00 – Utility Pipe and Materials and Section 33.05.13 – Manholes and Structures.

3.06 TESTING, INSPECTION, AND ACCEPTANCE
A. General: Testing and inspections shall be in accordance with the governing authority’s standards and specifications, Section 33.05.13 – Manholes and Structures and Section 33.03.00 - Utility Pipe and Materials.
B. Contractor shall ensure all applicable inspections and testing reports are furnished to the Engineer in accordance with Section 00.72.00 – General Conditions.

3.07 BACKFILL AND SITE CLEANUP
A. Backfill trench after pipe installation is complete (including inspection, if required).
B. Backfill and compact soil in accordance with Section 31.23.33 – Trenching and Backfilling.
C. Repair and replace removed or damaged pavement and sidewalks as specified in Section 32.20.00 – Site Restoration.
D. In unpaved areas, grade surface as uniform slope to natural grade as indicated on Drawings. Provide minimum of 4 inches of topsoil and seed according to requirements of Section 32.91.19 – Topsoil Placement and Grading.

END OF SECTION 30.30.00
SECTION 33.41.00
STORM UTILITY DRAINAGE PIPING

PART 1 GENERAL

1.01 DESCRIPTION
A. Work Included: Furnish all labor, materials, tools, transportation, supplies, plant equipment, and appurtenances necessary for the complete and satisfactory construction of the storm drainage system shown on the plans, completed and ready for service.
B. Related Sections: Additional Sections of the Documents which are referenced in this Section include:
   1. Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures
   2. Section 01.55.26 – Traffic Control
   3. Section 31.00.00 – Earthwork
   4. Section 31.23.33 – Trenching and Backfilling
   5. Section 32.91.19 – Topsoil Placement and Grading
   6. Section 33.03.00 - Utility Pipe and Materials
   7. Section 33.05.13 – Manholes and Structures

1.02 REFERENCES
A. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.
C. VDOT Road and Bridge Specifications, Latest Edition
D. VDOT Road and Bridge Standards, Latest Edition.
   1. Section 100: Drainage
   2. Section 1000: Box Culverts

1.03 QUALITY ASSURANCE
A. Contractor Responsibilities: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

1.04 SUBMITTALS
A. Submittals shall be in accordance with Section 00.72.00 – General Conditions, Paragraph 7, Submittal Procedures

PART 2 PRODUCTS

2.01 STORM DRAINAGE
A. Local Regulations or Standards: Contractor is responsible for confirming the jurisdiction of any local authority that may have local or state regulations or standards pertaining to the work herein; where there is conflict between the project specifications and the local or state standards, Contractor shall conform to the more stringent standards.
B. General: Fittings shall be of the same material and type as the gravity pipe provided, in accordance with Section 33.03.00 – Utility Pipe and Materials. Storm drainage pipe shall be provided in accordance with Section 33.00.00 – Utility Pipe and Materials at the Contractor’s option from the list included below, except where specified otherwise in Section 33.03.00 – Utility Pipe and Materials or on the plans.
1. Polyethelyne
2. Corrugate Steel
3. Reinforced Concrete
4. PVC
5. Ductile Iron Pipe

2.02 MANHOLES AND STRUCTURES
A. Structures shall be in accordance with Section 33.05.13 – Manholes and Structures and in conformance with VDOT Road and Bridge Standards (latest edition) and VDOT Road and Bridge Specifications (latest addition).

PART 3 EXECUTION

3.01 GENERAL
A. Installation of pipe, fittings, and appurtenances shall be in accordance with Section 33.03.00 – Utility Pipe and Materials, Section 33.05.13 – Manholes and Structures, and applicable state standards and specifications.

3.02 PREPARATION
A. Prepare traffic control plans and set up street detours and barricades in preparation for excavation when construction will affects traffic. Conform to requirements of Section 01.55.26 - Traffic Control.
B. Provide barricades, flashing warning lights, and signs for excavations. Conform to requirements of Section 01.55.26 - Traffic Control. Maintain barricades and warning lights for streets and intersections while Work is in progress or where traffic is affected by Work.
C. Immediately notify agency or company owning utility lines, which may be damaged, broken, or disturbed. Obtain approval from agency for repairs or relocations, either temporary or permanent.
D. Remove old pavements and structures, including sidewalks and driveways in accordance with requirements of Section 02.41.00 – Demolition, if removal is necessary.

3.03 EXCAVATION
A. Earthwork: Conform to requirements of Section 31.00.00 - Earthwork. Use bedding as indicated on Drawings and Standard Details.
B. Line and Grade: Establish required uniform line and grade trench from benchmarks identified by Engineer. Maintain this control for minimum of 100 feet behind and ahead of pipe-laying operation. Use laser beam equipment to establish and maintain proper line and grade of Work. Use of appropriately sized grade boards, which are substantially supported is also acceptable. Lines and grades shall be in accordance with Section 31.00.00 – Earthwork.
C. Trench Excavation shall be in accordance with Section 31.23.33 – Trenching and Backfilling.

3.04 PIPE INSTALLATION
A. Install in accordance with pipe manufacturer’s recommendations and as specified in Section 33.03.00 – Utility Pipe and Materials.

B. Install inlets, headwalls, and wing-walls to conform to requirements of VDOT Road and Bridge Standards and Specifications, Latest Edition.

3.05 BACKFILL AND SITE CLEANUP

A. Backfill trench after pipe installation is complete (including inspection, if required).

B. Backfill and compact soil in accordance with Section 31.23.33 – Trenching and Backfilling.

C. Repair and replace removed or damaged pavement and sidewalks as specified in Section 32.20.00 – Site Restoration.

D. In unpaved areas, grade surface as uniform slope to natural grade as indicated on Drawings. Provide minimum of 4 inches of topsoil and seed according to requirements of Section 32.91.19 – Topsoil Placement and Grading.

END OF SECTION 33.41.00