

BALTIMORE COUNTY PUBLIC SCHOOLS
Division of Business Services; Department of Fiscal Services; Office of Purchasing
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204

SPECIFICATION AND PROPOSAL

FOR

REPLACEMENT OF VICTORY VILLA ELEMENTARY SCHOOL

VOLUME 1 (Div. 0-14; APPENDIX)

SOLICITATION NUMBER: **ARA-209-17 (PSCP#03.057.17 LPC)**

BID ISSUED DATE: **November 10, 2016**

PRE-BID: A PRE-BID meeting is scheduled for **November 16, 2016 at 3:00 P.M.**; at **BCPS Office of Engineering and Construction, 9610 Pulaski Park Drive, Suite 204 Baltimore, Maryland, 21220.**

DUE DATE: December 8, 2016

DUE TIME: **2:00 P.M.** (Eastern Time Zone)

RETURN TO: BALTIMORE COUNTY PUBLIC SCHOOLS
OFFICE OF PURCHASING
ARA-209-17 Attn: Anita Randall
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204

PUBLIC OPENING: Same date, (10 minutes after due time)
Conference Room
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204

Failure to plainly identify as a "SEALED BID" on the outside of the return envelope may result in premature opening of the envelope and bid.

Baltimore County Public Schools reserves the right to waive informalities, to reject all bids, and to reissue this bid at its option, and does not make an obligation to purchase by issuing this bid.

For updated bid information please call the "Bidder's Hotline" at 410-887-7819 or visit our website www.bcps.org/offices/purchasing/bidboard/

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FOR

Victory Villa Elementary School
500 Compass Road, Maryland 21220

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November 10, 2016

PSCP #03.057.17 LP
ARA-209-17

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BALTIMORE COUNTY PUBLIC SCHOOLS

S. Dallas Dance, Ph.D. Superintendent

6901 Charles Street

Towson, Maryland 21204-3711

SECTION 00 1000 – NOTICE TO CONTRACTORS

The Board of Education of Baltimore County invites Trade Contractors to bid on the **REPLACEMENT OF VICTORY VILLA ELEMENTARY SCHOOL, Solicitation Number ARA-209-17 (PSCP#03.057.17 LP)**. Procurement questions can be emailed to Anita Randall at arandall@bcps.org. Verbal questions will not be taken.

Contractors proposing to bid may obtain solicitation documents beginning at **2:00 pm on Thursday, November 10, 2016**. Visit website: <http://www.bcps.org/offices/purchasing/> and click onto "Invitation to Bid". Solicitation documents can be ordered electronically or picked-up in person from Gardens Reprographics (419 Saint Paul Place, Baltimore, MD 21202. Hours: Monday through Friday 8 – 5. Phone: 410-539-2763).

A pre-bid meeting is scheduled for **November 16, 2016 at 3:00 P.M. at BCPS Office of Engineering and Construction, 9610 Pulaski Park Drive Suite 204 Baltimore, Maryland, 21220.**

Sealed bids will be received until **2:00 P.M.**, December 8, 2016 in the Office of Purchasing at Baltimore County Public Schools, located at 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204. A public bid opening will take place approximately 10 minutes after the due date and time for this solicitation.

All bidders shall be pre-qualified by Baltimore County Department of Public Works (BCDPW), Contracts Division. Category "I" Buildings, Classification Number 1 (Construction), prior to the date of bid opening.

Certified Minority Business Enterprises are encouraged to respond to this solicitation notice. The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the specific overall MBE goal of 30 percent established for this project. All prime contractors, including certified MBE firms, when submitting bids or proposals as general or prime contractors, are required to attempt to achieve this goal from certified MBE firms. The subgoals established for this project are 7 percent from African American-owned businesses and 4 percent from Asian American-owned businesses. Any MBE firms bidding should review the provisions in COMAR 21.11.03.12-1 for counting a portion of self-performance toward meeting the stated goals. The bidder or offeror is required to submit with its bid or proposal a completed Attachment A - Certified MBE Utilization and Fair Solicitation Affidavit and Attachment B - MBE Participation Schedule, as described in the solicitation documents.

This project is subject to State of Maryland Prevailing Wage Rates as determined by the Department of Labor, Licensing & Regulation - Division of Labor & Industry.

The Baltimore County Department of Public Works' cost group for this project is H: Over \$15 Million. Commodity Code: 909-67

The Board of Education of Baltimore County reserves the right to reject any or all proposals and to waive informalities.

By Order of the Board of Education of Baltimore County
Office of Purchasing

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Creating a Culture of Deliberate Excellence

BALTIMORE COUNTY PUBLIC SCHOOLS

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**BALTIMORE COUNTY PUBLIC SCHOOLS
PART I: GENERAL TERMS AND CONDITIONS**

1.0 DEFINITIONS

- 1.1 For the purpose and clarity of this document only, "BCPS" will mean the Baltimore County Public Schools and the Baltimore County Board of Education and its officials and employees.
- 1.2 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between BCPS and Award Bidder, Conditions of the Contract (General Supplementary and other Conditions), Drawings, Specifications, and all Addenda issued prior to execution of the Contract.
- 1.3 Definitions set forth in The American Institute of Architects (AIA) Contract Documents (modified), or in other BCPS Contract Documents are applicable to the Solicitation/Bidding Documents.
- 1.4 Addenda are written or graphic instruments issued by BCPS or its representative prior to the execution of the Contract which modify or interpret the Solicitation by additions deletions clarifications or corrections.
- 1.5 A Bid is a complete and properly signed proposal to do the Work and/or provide the Goods for the sums stipulated therein submitted in accordance with the Solicitation.
- 1.6 The Base Bid is the sum stated in the Solicitation for which the Bidder offers to perform the Work described in the Solicitation as the base to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.
- 1.7 An Alternate is an amount stated in the Proposal/Bid that may be added to or deducted from the amount of the Base Bid if the corresponding change in the Work as described in the Solicitation is accepted.
- 1.8 A Unit Price is an amount stated in the Solicitation as a price per unit of measurement for materials equipment or services or a portion of the Work as described in the Solicitation.
- 1.9 A Bidder is any reliable and interested person, broker, vendor, contractor and/or manufacturer who responded to the solicitation /submits a Bid/Proposal.
- 1.10 An Award Bidder is a person or entity who submits a Proposal/Bid and has been approved by the Board of Education for award.
- 1.11 A Sub-contractor is a person or entity who submits a proposal or bid to an Award Bidder for materials, equipment, or labor for a portion of the Work.

2.0 AN INVITATION TO BID

- 2.1 BCPS invites all interested and qualified Contractors to submit a proposal/bid. These specifications are intended to cover the purchase of services and/or commodities requested and include, but are not limited to, providing labor, materials, equipment and supervision of labor and subcontractors to complete requirements as identified [by BCPS].
- 2.2 In accordance with State law and BCPS policies, notices and announcements shall be published a minimum of 14 calendar days in advance of due date for any proposal/bid having a potential award value of \$25,000 or more.
- 2.3 Unless otherwise indicated, BCPS shall receive sealed proposals/bids until date and time indicated on bid or as modified by addenda. Proposals/Bids must be delivered to the BCPS Office of Purchasing located at 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204. Proposals/Bids must be delivered in sealed opaque envelopes and clearly marked on the outside: Name of Bidder, Due Date and Time, Solicitation/Bid Number and Solicitation Title.
- 2.4 Brand name and model numbers are offered as a reference for bidders as to the style, size, weight, and other characteristics of the item(s) in the specifications. The use of such brand names should not be interpreted as the exclusive brand desired unless so stated. The determination of the acceptability and/or the criteria for acceptability of an alternate is solely the responsibility of BCPS. (Refer to Part II: Specifications--General Requirements and/or Part III: Technical Specifications).
- 2.5 The Bidder or their authorized representatives are expected to fully inform themselves as to the conditions, requirements, circumstances, prerequisites, qualifications and/or specifications before submitting their proposal/bid. A Bidder's failure to become fully informed is at the Bidder's sole and complete risk of loss. The Bidder shall have no right to any damages, cost and/or any other remedy at law or equity against BCPS for any miscalculation, misunderstanding, error (either omissions or commissions), mistake, misinterpretation, and/or the failure by the Bidder to obtain an award of bid, award of contract and/or profits, fees or money from BCPS when the Bidder failed to fully inform themselves. In the case of error in extension of prices in the bid, the unit price shall govern or the entire proposal/bid may be declared non-responsive.
- 2.6 Upon evaluation of all responses, a recommendation for the award of contract will be presented to the Board of Education of Baltimore County for approval. Upon approval of the award of contract, the bidder(s) shall be notified either by mail, telephone or purchase order of their award(s). When applicable, a BCPS contract document shall also be issued.
- 2.7 The Bidder will not be allowed to offer more than one price on each item even though he may feel that he has two or more types or styles that will meet specifications. Bidder must determine which to offer. IF SAID BIDDER SHOULD SUBMIT MORE THAN ONE PRICE ON ANY ITEM, ALL PRICES FOR THAT ITEM WILL BE REJECTED AND THE PROPOSAL/BID WILL BE DECLARED NON-RESPONSIVE.

- 2.8 Where provision is made on the proposal form for bidding items on an individual, group or aggregate basis, the award will be made on whichever basis is in the best interest of the BCPS. When an aggregate bid is requested, the unit prices for each item shall be identified on the proposal sheet for accounting purposes. The unit prices in an aggregate bid should be consistent with the total quoted price for an aggregate bid. A "NO BID" on a combination of items will be permitted except as otherwise provided for on the proposal sheet and/or in PART II: SPECIFICATIONS-GENERAL REQUIREMENTS AND PART III: TECHNICAL SPECIFICATIONS.
- 2.9 The product offered by the bidder shall be new, not used, and the latest version. Should a product be discontinued and/or upgraded during the course of the contract, the Award Bidder shall offer to BCPS a new alternate product meeting and/or exceeding the established specifications, under the same terms, conditions and prices as the originally offered item.
- 2.10 The Award Bidder, after award and before manufacture and/or shipment, may be required to submit working drawings or detailed descriptive data identified as acceptable to BCPS, which provide sufficient data to enable BCPS to judge the bidder's compliance with specifications.

3.0 BID PREPARATION, PROPOSAL SHEET, AND BID OPENING

- 3.1 Bidder must submit one (1) original with original signatures of the proposal using BCPS proposal forms. The bidder should make and retain one (1) copy of the bid for their files. Bids must be signed and submitted by an authorized representative of the bidder. Each bidder may attach a letter of explanation to the bid, if so desired, to provide an explanation of any detail(s) in the bid.
- 3.2 Signed proposals/bids should be returned in a sealed envelope. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate sealed opaque mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof. BCPS shall not accept any facsimile transmission to agents, representatives or employees as meeting the requirement of the sealed bid. A facsimile document shall not be considered a valid response to the bid specification.
- 3.3 Each bid must show the full business address, telephone number, and fax number of the bidder and be signed by the person or persons legally authorized to sign contracts. All correspondence concerning the bid and contract, including Notice of Award, copy of Contract, and Purchase Order, will be mailed or delivered to the address shown on the bid in the absence of written instructions from the bidder to the contrary.
- 3.4 All bidders shall be required to complete the certificates and/or affidavits, and/or acknowledgements that are incorporated into the proposal pages of this specification. Such documents are required by local, state or federal funding agencies of BCPS as part of the bidding process. The documents may include: Anti-Bribery Affidavit, Debarment Certificate, Sales Tax Certification, Minority Bidder Status, and when applicable, Asbestos Free Certification.

3.5 Bid Opening

- 3.5.1 At the public opening of the bid, the bidder's names and their prices will be read and posted.
- 3.5.2 Complete evaluations of the proposals/bids will not take place at the bid opening and no indication of award will be made. BCPS reserves the right to review all responses and analyze the results of the procurement process.
- 3.5.3 A final recommendation(s) shall be prepared for review and approval by the Board of Education of Baltimore County.
- 3.5.4 The recommended award will be available in the Office of Purchasing after the completed evaluation.
- 3.5.5 Proposals will be available for review by the public after Award of Contract by the Board of Education of Baltimore County. Upon acceptance and approval of the proposal(s)/bid(s) by the Board of Education, a binding contract shall be established between BCPS and the Award Bidder(s). Bidder(s) may contact the Office of Purchasing to arrange a date and time to review bid documents.

3.6 At the time of the bid opening each bidder will be presumed to have read and to be thoroughly familiar with the specifications and related documents (including all Addenda). The failure or omission of any bidder to receive or examine any form, instrument, or document, shall in no way relieve them from any obligation in respect of his bid.

3.7 Any omissions, errors, conflicts, or discrepancies in this document shall be called to the attention of BCPS IN WRITING at least seven (7) business days prior to the date fixed for the opening of bids.

4.0 **MULTI-AGENCY PROCUREMENT**

4.1 BCPS reserves the right to extend the terms and conditions of this solicitation to any and all other agencies within the state of Maryland as well as any other federal, state, municipal, county, or local governmental agency under the jurisdiction of the United States and its territories. This shall include but not limited to private schools, parochial schools, non-public schools such as charter schools, special districts, intermediate units, non-profit agencies providing services on behalf of government, and/or state, community and/or private colleges/universities that require these goods, commodities and/or services. This is conditioned upon mutual agreement of all parties pursuant to special requirements, which may be appended thereto. The supplier/contractor agrees to notify the issuing body of those entities that wish to use any contract resulting from this bid and will also provide usage information, which may be requested. A copy of the contract pricing and the bid requirements incorporated in this contract will be supplied to requesting agencies.

- 4.2 Each participating jurisdiction or agency shall enter into its own contract with the Award Bidder(s) and this contract shall be binding only upon the principals signing such an agreement. Invoices shall be submitted in duplicate "directly" to the ordering jurisdiction for each unit purchased. Disputes over the execution of any contract shall be the responsibility of the participating jurisdiction or agency that entered into that contract. Disputes must be resolved solely between the participating agency and the Award Bidder. BCPS does not assume any responsibility other than to obtain pricing for the specifications provided.

5.0 BID SECURITY

- 5.1 If so stipulated in the Advertisement, Invitation to Bid, or supplementary instructions to bidders, each Proposal/Bid shall be accompanied by a Bid Bond in the dollar amount of five percent (5%) of the Base Bid. This Bid Bond pledges that the Bidder will enter into a Contract with BCPS on the terms stated in the Solicitation and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising hereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds, where required, the amount of the Bid Security/Bid Bond/Surety Bond shall be forfeited to BCPS as liquidated damages not as a penalty. This bond must be provided with the proposal/bid submission and failure to do so may be cause for rejection of the bid as being non responsive. The cost of the bid bond will be borne by the bidder(s) in all instances.
- 5.2 If a surety bond is required it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents and the attorney in fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.
- 5.3 BCPS will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished or (b) the specified time has elapsed so that bids may be withdrawn or (c) all proposals/bids have been rejected.
- 5.4 All bonds must be underwritten by surety companies which are authorized to transact surety business in the State of Maryland. If a bonding company is used that is not authorized, the contract will be Terminated for Default or if the required bond is a bid bond, this is just cause for rejection of the bid as being non responsive.
- 5.5 Performance Bonds and/or payment bonds are required for proposals/bids meeting the following conditions. The Award Bidder(s) of this contract may be required to submit either one or both of these bonds within ten (10) days of receipt of the Notice of Intent to Award and in accordance with the terms stated below. The cost of the performance bond and/or payment bond will be borne by the bidder(s) in all instances.
- 5.5.1 Performance Bond shall be required for contracts and/or awards of construction contracts in excess of \$30,000.00 for the amount of 100% of the contract price to cover faithful performance of the contract. Simultaneously with his delivery of the executed contract, the Award

Bidder must deliver to BCPS an executed bond in the amount of one hundred percent (100%) of the accepted bid as security for the faithful performance of his contract and for the payment of all persons performing labor or furnishing materials in connection therewith, prepared on the standard bond form A 311 as approved and issued by the American Institute of Architects and having as surety thereon such surety company or companies as are authorized to transact surety business in the State of Maryland and approved by the Board of Education of Baltimore County and are authorized to transact business in this State. Performance Bond shall be made out in the name of the "Board of Education of Baltimore County". They shall be provided to the Office of Purchasing, Contracting Assistant, 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204.

5.5.2 Payment Bond shall be required for contracts and/or awards of construction contracts in excess of \$30,000.00 for the amount of 100% of the contract price as security for the payment of all persons performing labor and furnishing materials in connection therewith when required by BCPS. Payment Bonds shall be made out in the name of the "Board of Education of Baltimore County". They shall be provided to the Office of Purchasing, Contracting Assistant, 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204.

5.6 Certified checks in the amount(s) stated above will be accepted in lieu of the performance bond and payment bond only upon prior approval of the Purchasing Agent. If checks are approved for acceptance in lieu of either bond, they should be in the same amount as these bonds; be separate checks; and should clearly designate the purpose i.e., performance of payment.

5.6.1 Certified checks, if submitted, will be deposited in the BCPS bank account(s). Upon successful completion of the contract, check(s) will be drawn upon the Board's bank account(s) for the full amounts of both certified checks.

5.6.2 Certified checks shall be made out in the name of the "Board of Education of Baltimore County". They shall be provided to the Office of Purchasing, Contracting Assistant, 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204.

5.7 A letter of credit drawn on a bank with a local branch may be used in place of bonds. Letters of credit should list the beneficiary as Board of Education of Baltimore County. Letters of credit drawn on a bank shall be made out in the name of the "Board of Education of Baltimore County". They shall be provided to the Office of Purchasing, Contracting Assistant, 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204.

5.8 ACCEPTABLE BID SECURITY

5.8.1 Baltimore County Public Schools may require performance or payment bonds, or both, on supply, service, maintenance, or construction-related service contracts if the contract is expected to exceed \$100,000.

Acceptable security for bid, performance, and payment bonds is limited to a bond in a form satisfactory to Baltimore County Public Schools underwritten by a surety company authorized to do business in the State of Maryland.

Should the bidder be denied corporate surety credit for whatever reason Baltimore County Public Schools will accept an Irrevocable Trust Receipt (ITR) issued by an individual surety. This individual surety must work through insurance agents licensed in the State of Maryland, in accordance with Maryland law.

5.8.2 The bidder electing to use a bond provided by an individual surety shall provide evidence with the bond in a form satisfactory to Baltimore County Public Schools that the Contractor has been denied credit by a corporate surety within the past 3 years from the date the bond was submitted, based on a good faith application by the contractor, and the Individual surety transacts business only through an insurance agency licensed to do business in the State of Maryland. A letter issued and duly authorized from the conventional bonding company denoting the “reason for denial” must be submitted with the bid as “Proof of Denial”, and provided that the individual surety can meet all Maryland statutory and regulatory requirements, including, but not limited to, Subtitle 6 of Title 21 of the code of Maryland regulations. Failure to meet the bonding requirement(s) shall be cause for immediate rejection of the bid.

5.8.3 Individual sureties for contracts and bonds shall be United States citizens. An individual surety may be accepted only if a security interest or recorded mortgage creating a lien on assets acceptable to the procurement officer is provided to the State by the individual surety and, an individual surety shall submit documents with a bond that confirms the assets supporting the bond. Acceptable assets include, but are not limited to;

1. Cash or certificates of deposit,
2. Cash equivalents held with a federally insured financial institution,
3. Assets that are evidenced by a security interest, including an irrevocable trust receipt issued by the financial institution or by an independent trustee in the name of Baltimore County Public Schools, and are issued in accordance with Commercial Law Article, §9-109, Annotated Code of Maryland.

5.8.4 Unacceptable assets include, but are not limited to:

1. Notes or accounts receivable and,
2. Foreign securities and,
3. Real property as follows:
 - a. Real property located outside of the State and,
 - b. Real property that is the principal residence of the surety and,

- c. Real property owned concurrently, regardless of the form of co tenancy, including joint tenancy, tenancy by the entirety, and tenancy in common, except where all cotenants agree to act jointly.

5.8.5 Whenever a bond with a security interest in real property is submitted, the individual surety shall provide:

1. Evidence of title in the form of a certificate of title prepared by an attorney or a title insurance company licensed by the State;
2. Title evidence showing:
Fee simple title vested in the contractor or surety along with any concurrent owners;
Whether any real estate taxes are due and payable and,
All recorded encumbrances.

5.8.6 Acceptability as an individual surety:

1. A corporation, partnership, or other unincorporated association or firm,
2. A member of a partnership, if that member is a principal obligor,
3. Stockholders of corporate principals are acceptable as individual sureties, provided their qualifications are independent of the stockholder's financial holdings.

5.8.7 If a bond with a security interest in personal property is submitted, the individual surety shall provide evidence of title in a form satisfactory to Baltimore County Public Schools. Except for irrevocable letters of credit and irrevocable trust receipts, Uniform Commercial Code (UCC) security interests in personal property assets shall be provided to Baltimore County Public Schools.

6.0 TIE BIDS

6.1 In the event of tie bids, where all other factors such as past performance on purchases or bidder's service or delivery record are considered comparable, the award(s) shall be made to one of the tie bidders in the following order of preference: Baltimore County minority and/or small business enterprise vendor; the Baltimore County based bidders; out-of -county but Maryland based minority and/or small business enterprise vendor; the out-of-county but Maryland based bidder; out-of-state minority and/or small business enterprise vendor and the out-of-state based bidder.

6.2 In the event a tie bid still exists, the Manager, Office of Purchasing or their designee, shall conduct a coin toss for selection of the potential Award Bidder(s) or seek a geographical, proportional or divided award of contract, whichever is in the best interest of BCPS.

7.0 BID PRICES

- 7.1 Any bidder may withdraw his bid submission prior to the bid opening date and time specified. After this, BCPS has a period of one-hundred twenty (120) calendar days to issue a Purchase Order or have award of contract approved by the Board of Education. The bidder agrees to retain all prices and requirements of the bid until the completion of the contract period
- 7.2 Unit Prices must be rounded off to no more than two (2) decimal places, unless otherwise specified.
- 7.3 Cash discounts will not be taken into consideration in determining a contract award. All discounts, other than prompt payment, are to be included in bid price.
- 7.4 BCPS reserves the right to accept price reductions from the award bidder during the term of this contract.
- 7.5 BCPS will not accept any proposals with bidder escalator clauses, unbalanced figures or irregular features.
- 7.6 If a Base Bid and/or Alternate amount contain contradictory terms, typewritten terms prevail over printed terms, handwritten terms prevail over both, and words prevail over numbers, the dollar amount expressed in words shall govern.

8.0 TAXES AND PERMITS

- 8.1 Materials, which are incorporated into work under formal or informal contracts, are not exempt from the Maryland State Sales or Use Tax. Award Bidders shall be responsible for paying such taxes when purchasing materials.
- 8.2 Award Bidders shall obtain and pay for any permits required.

9.0 BILLING AND PAYMENTS

- 9.1 All invoices are to be submitted in duplicate and mailed as specified and directed to either:
 - Baltimore County Public Schools
Engineering & Construction
9610 Pulaski Park Drive, Suite 204
Baltimore, Maryland 21220
 - OR
 - Baltimore County Public Schools
Accounts Payable
6901 Charles Street, Building "E"
Towson, Maryland 21204
- 9.2 To expedite payments you must follow these guidelines:

- 9.2.1 All invoices must contain a valid Baltimore County Public Schools' purchase order number.
- 9.2.2 An itemized packing slip including the purchase order number and dollar amounts must accompany all supplies and materials delivered.
- 9.3 Standard BCPS payment terms are net 30 days. Payments made directly by BCPS will be made within 30 days from invoice date or receipt of goods, whichever is later. Payments made by any other agency may not meet these terms.
- 9.4 Payment in full will only be made upon completion of contract.

10.0 GOVERNING LAW AND VENUE

The bid shall be construed in accordance with, and interpreted under, the laws of the State of Maryland. Any lawsuits arising out of such bid shall be filed in the appropriate State Court located in Baltimore County, Maryland.

11.0 ADDENDA

- 11.1 All changes to the bid specifications will be made through appropriate addenda issued from the Office of Purchasing.
- 11.2 Addenda will be available to all who are known by the Office of Purchasing to have received a completed set of Bid Documents.
- 11.3 Copies of Addenda will be made available for inspection wherever Bid Documents are on file.
- 11.4 All changes to the bid documents will be made through the appropriate addenda. Any and all such interpretations and any supplemental instructions will be available to all project plan holders. Addenda will be issued a minimum of five (5) business days prior to the date fixed for the opening of bids, excluding date of bid opening, unless the addendum issued extends the due date of the bid. It is the bidders' responsibility to verify receipt of all addenda. Failure of any bidder to receive any addenda or interpretation shall not relieve that bidder from any obligations under this bid and as amended by all addenda. All addenda so issued shall become a part of the award and contract documents.
- 11.5 Each Bidder shall ascertain prior to submitting a Bid that they have received all Addendum issued and the Bidder shall acknowledge their receipt on the Addenda Affidavit Form. The Addenda Affidavit Form shall be completed and returned in duplicate with the bid proposal response. Failure to return the Addenda Affidavit Form may be reason for rejection of the bid.

12.0 INSURANCE

- 12.1 Award Bidder's LIABILITY INSURANCE

12.1.1 The Award Bidder shall purchase and maintain in a Company or Companies acceptable to the BCPS such insurance as will protect him from claims set forth below which may arise out of or result from the Award Bidder's operations under the Contract, whether such operations be by himself or by 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 workers' or 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 his employees;
- .3 claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
- .4 claims for damages insured by usual personal injury liability coverage, which are sustained (1) by any person as results of an offense directly or indirectly related to the employment of such person by the Award Bidder, or (2) by any other person;
- .5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting there from;
- .6 claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle; and
- .7 claims for damages because of employee dishonesty by any of the Award Bidder's employees.

12.1.2 The insurance required by Subparagraph 12.1.1 shall be written for not less than the following, or greater if required by law:

- .1 Comprehensive General Liability

Bodily Injury: \$1,000,000 each occurrence--\$1,000,000 aggregate
Property Damage: \$500,000 each occurrence--\$500,000 aggregate
or if such insurance is written with a combined single limit, not less than \$1,500,000 each occurrence, \$1,500,000 aggregate. Such insurance shall include:

- .1 Premises/Operations;
- .2 Independent Contractor's;
- .3 Products/Completed Operations to be maintained for two years after final payment;
- .4 Contractual Liability including protection for the Award Bidder from claims arising out of liability in connection with this contract;

- .5 Personal Injury Liability including coverage for offenses related to employment;
- .6 Explosion, Collapse and Underground hazards as applicable
- .2 Comprehensive Automobile Liability
 - Liability - \$1,000,000
 - Personal Injury Protection - Statutory
 - Uninsured Motorists - Statutory
- .3 Workers' Compensation--Maryland Benefits - Statutory
Employer's Liability - \$100,000
- .4 Blanket Fidelity
- .5 **Prime Contractor** Pollution Liability:
 - Each Occurrence Limit: \$1,000,000
 - General Aggregate Limit: \$1,000,000

Claims Made or Occurrence Forms are acceptable

12.1.3 Certificates of Insurance acceptable to the BCPS shall be filed with the BCPS prior to commencement of the Work. The Certificates of Insurance will state that such insurance is in force and cannot be cancelled or released except upon thirty (30) days prior written notice to the Board of Education of Baltimore County. **The Certificate of insurance must name the Board of Education of Baltimore County as an additional insured.**

12.2 BCPS'S LIABILITY INSURANCE--BCPS shall be responsible for purchasing and maintaining its own liability insurance and, at its option, may purchase and maintain such insurance as will protect him against claims which may arise from operations under the Contract. Baltimore County Board of Education is a member of the Board of Education Group Insurance Pool (the Pool), which provides property self-insurance. Coverage is effective July 1 through June 30 annually. The Pool is a self-insurance mechanism, authorized under Maryland law, by which boards of education pool together to provide property self-insurance coverage.

The Board of Education of Baltimore County is subject to the provisions of Md. Code Ann., Educ. '4-105 and Md. Code Ann., Cts. & Jud. Proc. '5-518 limiting liability to \$100,000.00. Pursuant to the provisions of the aforementioned statute, the Board of Education of Baltimore County is a member of the Maryland Association of Board of Education Group Insurance Pool for comprehensive liability coverage to \$100,000.00.

12.3 PROPERTY INSURANCE

12.3.1 Unless otherwise provided, the BCPS shall purchase and maintain property insurance, subject to a deductible of \$10,000 to be assumed by the BCPS, upon the entire Work at the site to the full insurable value

thereof. This insurance shall include the interests of the BCPS, the Award Bidder, Subcontractors and Sub-subcontractors in the Work and shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss or damage including, vandalism and malicious mischief. If the BCPS does not intend to purchase such insurance for the full insurable value of the entire Work, he shall inform the Award Bidder in writing prior to commencement of the Work. The Award Bidder may then affect insurance, which will protect the interests of him, his Subcontractors and the Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the BCPS. If the Award Bidder is damaged by failure of the BCPS to purchase or maintain such insurance and to so notify the Award Bidder, then the BCPS shall bear all reasonable costs properly attributable thereto. The BCPS does not maintain insurance of any kind on tools, equipment, temporary offices, sheds, shacks and other property of the Award Bidder or of his employees, nor materials or supplies stored away from the job site. It shall be the complete responsibility of the Award Bidder to provide for his own protection and that of his employees against any losses of such tools, equipment and other property, and materials and supplies stored away from the job site.

- 12.3.2 The Award Bidder shall purchase and maintain boiler and machinery insurance if this contract includes installation, modification or repair of such equipment. This insurance shall be at limits of not less than \$500,000, covering all boilers and other equipment not covered for explosion by standard property insurance policies. This insurance shall include the interests of the BCPS, the Award Bidder, Subcontractors and Sub-subcontractors in the Work.
- 12.3.3 Any loss insured under Subparagraph 12.3.1 is to be adjusted with the BCPS and made payable to the BCPS as trustee for the insured, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Subparagraph 12.3.8. The Award Bidder shall pay each Subcontractor a just share of any insurance moneys received by the Award Bidder, and by appropriate agreement, written where legally required for validity, shall require each Subcontractor to make payments to his Sub-subcontractors in similar manner.
- 12.3.4 BCPS maintains a copy of all policies, which are available to the Award Bidder for inspection before an exposure to loss may occur.
- 12.3.5 If the Award Bidder requests in writing that insurance for risks other than those described in Subparagraph 12.3.1 or other special hazards are included in the property insurance policy, the BCPS shall, if possible, include such insurance, and the cost thereof shall be charged to the Award Bidder by appropriate Change Order.
- 12.3.6 If required in writing by any party in interest, the BCPS as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of his duties. He shall deposit in a separate account any money so received, and he shall distribute it in accordance with such

agreement as the parties in interest may reach, or in accordance with an award by arbitration in which case the procedure shall be as provided. If after such loss no other special agreement is made, replacement of damaged work shall be covered by an appropriate Change Order.

12.3.7 BCPS as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within five days after the occurrence of loss to the BCPS's exercise of this power, and if such objection be made, arbitrators shall be chosen. The BCPS or trustee shall, in that case, make settlement with the insurers in accordance with the directions of such arbitrators. If distribution of the insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

12.3.8 BCPS and Award Bidder waive all rights against (1) each other and the Subcontractors, Sub-subcontractors, agents and employees each of the other, and (2) the Architect and separate contractors, if any, and their Subcontractors, Sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Paragraph 12.3 or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the BCPS as trustee. The foregoing waiver afforded the Architect, his agents and employees shall not extend to the liability of the Architect, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, his agents or employees providing such giving or failure to give is the primary cause of the injury or damage. The BCPS or the Award Bidder, as appropriate, shall require of the Architect, separate Contractors, Subcontractors and Sub-subcontractors by appropriate agreements, written where legally required for validity, similar waivers of each in favor of all other parties enumerated in this Subparagraph 12.3.6.

12.3.9 If BCPS finds it necessary to occupy or use a portion or portions of the facility where work is being done prior to Substantial Completion thereof, such occupancy shall not commence prior to a time mutually agreed to by the BCPS and Award Bidder and to which the insurance company or companies providing the property insurance have consented by endorsement of the policy or policies. This insurance shall not be cancelled or lapsed on account of such partial occupancy. Consent of the Award Bidder and of the insurance company or companies to such occupancy or use shall not be unreasonably withheld.

12.4 Loss of Use Insurance

The BCPS, at its option, may purchase and maintain such insurance as will insure him against loss of use of his property due to fire or other hazards, however caused.

12.5 Evidence of Insurance

12.5.1 Prior to the award of contract, the Award Bidder is required to submit a certificate of insurance evidencing Worker's Compensation and Employer Liability Insurance in the amounts required above, and in addition, this certificate will indicate the amounts of insurance carried by the Bidder of the following types: Comprehensive General Liability Insurance, Comprehensive Automobile Insurance, Excess Liability Insurance, and any other insurance coverage maintained by the Award Bidder. The Certificates of Insurance will state that such insurance is in force and cannot be cancelled or released except upon thirty (30) days prior written notice to the Board of Education of Baltimore County. **The Certificate of insurance must name the Board of Education of Baltimore County as an additional insured.**

12.5.2 All Required Insurance Coverage must be underwritten by insurers allowed to do business in the State of Maryland and acceptable to the Board. The insurers must also have a policyholder's rating of "B" or better, and a financial size of "Class VII" or better in the latest evaluation by A. M. Best Company. The board hereby grants specific approval for the acquisition of worker's compensation and employer's liability insurance from the Injured Worker's Insurance Fund of Maryland.

13.0 **DIRECT DAMAGES**

In the event the Award Bidder fails to deliver the goods or services of the contract in accordance with the specifications, BCPS reserves the right to purchase the goods/services on the open market. All expenses incurred by BCPS as a result of such purchases will be deducted from the monies owed or monies which may become due.

14.0 **TERMINATIONS/SUSPENSIONS FROM CONTRACT**

14.1 Termination by BCPS for Cause

14.1.1 BCPS may terminate the Contract if the Award Bidder:

- .1 persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Award Bidder and the Subcontractors;
- .3 persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or
- .4 otherwise is guilty of substantial breach of a provision Of the Contract Documents such, but not limited to: (1) Maintain progress in accordance with Project schedule; (2) Prevents other contractors from meeting their scheduled progress; (3) has unsatisfactorily performed the contract.

- 14.1.2 When any of the above reasons exist, BCPS, after consultation with the Construction Manager, and after determining that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of BCPS and after giving the Award Bidder and the Award Bidder's surety, if any, seven days written notice, terminate employment of the Award Bidder and may, subject to any prior rights of the surety take the following actions:
- .1 take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Award Bidder
 - .2 accept assignment of subcontracts and
 - .3 finish the Work by whatever reasonable method BCPS may deem expedient.
- 14.1.3 When BCPS terminates the Award Bidder for one of the reasons stated above, the surety shall not, without the written consent of BCPS, retain the Award Bidder for the Work and the Award Bidder shall not, without written consent of BCPS, perform any of the Work.
- 14.1.4 When BCPS terminates the Contract for one of the reasons stated above, the Award Bidder shall not be entitled to receive further payment until the Work is finished.
- 14.1.5 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, such excess shall be paid to the Award Bidder. If such costs exceed the unpaid balance, the Award Bidder shall pay the difference to BCPS. The amount to be paid to the Award Bidder or BCPS, as the case may be, shall, upon application, be certified by the Architect after consultation with the Construction Manager and this obligation for payment shall survive termination of the Contract.
- 14.2 Termination for Convenience: In the event that BCPS determines to terminate this contract for convenience, then BCPS will provide the Contractor with written notice of that termination for convenience. The parties agree that the provisions of this contract, which would be their nature survive final acceptance of the work or service described and required by the contract and bid documents, shall remain in full force and effect after any termination for convenience in order to implement the following provisions.
- 14.2.1 In the event of such a termination for convenience, the Contractor agrees to waive any claims for damages including, but not limited to anticipated profits, mark-ups or payroll reimbursements. The Contractor agrees that upon such termination for convenience the sole right and/or remedy available to the Contractor will be the right of the Contractor to be paid the actual cost of all work properly performed by the Contractor

prior to the date of the termination. The Contractor further agrees that it will only be entitled to payment for work not previously paid for in other sums of money already received by the Contractor under any of the terms and conditions of this agreement. If at the date of such termination that Contractor has properly purchased, prepared or fabricated, off the site, any goods for subsequent incorporation in the work, and if the Contractor delivers such goods to the site or to such other place as BCPS shall reasonably direct, then the Contractor shall be paid for such goods or materials.

14.2.2 Upon receipt of such notice the Contractor shall, unless notice directs otherwise, immediately discontinue the work on that date and, to the extent specified in the notice, place no further order or subcontracts for materials, equipment, services or facilities except as may be necessary for completion of such portion of the work, as is not discontinued: promptly make every reasonable effort to procure cancellation upon terms satisfactory to BCPS of all orders and subcontracts to the extent that related to the performance of the discontinued portion of the work, and shall thereafter do only such work as may be necessary to preserve and protect work already in progress and to protect materials, plants and equipment on the site or in transit thereto.

14.2.3 Upon such termination, the obligations of the contract shall continue as to portions of the work already performed and as to bona fide obligations assumed by the Contractor prior to the date of termination.

14.2.4 The Contractor agrees that the Contractor does not have a right to termination for convenience.

14.3 BCPS reserves the right to terminate this contract, in whole or in part, because of non-appropriation of funds by the fiscal authorities. In the event of a termination for non-appropriation of funds, the provisions of Paragraphs 14.2.1, 14.2.2 and 14.2.3 above shall be controlling.

15.0 DRUG, TOBACCO, AND ALCOHOL

15.1 All Baltimore County Board of Education and BCPS properties are "drug, tobacco, and alcohol free zones" as designated by federal, state and local laws and by Board of Education policy. Neither the Contractor nor any of the Contractor's employees, subcontractors or agents will be permitted to have any illegal drugs; tobacco products; or alcohol products while performing their duties under this Contract and while working on Board of Education and BCPS property. Use or possession of illegal drugs, tobacco products, or alcohol products on school property will result in immediate removal of the offending individual(s). BCPS reserves the right to issue, at a minimum, a verbal directive to the offending individual(s) to comply with this prohibition and to cease use. The Contractor will be notified in writing of any violation(s).

15.2 Any subsequent offense by any individual or individuals may result in a permanent ban from the project for the offender(s), with appropriate formal notice to the Contractor. BCPS reserves the right to document any offenses in the

Contractor's file maintained by the Office of Purchasing. BCPS further reserves the right to address any substance use infraction by any means it deems necessary, up to and including termination of the Contract. In the event that a Contract is terminated as a result of a substance abuse infraction, BCPS will provide an "unsatisfactory" reference when references are requested.

16.0 APPEAL PROCESS

16.1 BCPS intends the appeal process to resolve contract disputes in a manner consistent with the effort to promote fair and open competition. Any bidder objecting to the recommendation for award or the award of contract may appeal the action to the Office of Purchasing by formally notifying the designated Purchasing Agent in writing no later than seven calendar days after the basis for appeal is known. The bidder shall have an opportunity to meet and/or talk with the Purchasing Agent to present the issues. A formal written response to the appeal shall be issued in a timely manner.

16.1.1 For an appeal of recommendation of award of contract, the decision of the Purchasing Agent shall be reviewed by the Manager, Office of Purchasing. The Manager, Office of Purchasing may approve, modify or disapprove the decision of the Purchasing Agent. In disapproving, the decision, the appeal will be remanded to the Purchasing Agent for resolution. In all other cases, the decision of the Manager, Office of Purchasing is the final action by BCPS. The decision shall include a statement of the decision, with supporting material. Bidders receiving a decision on an appeal of recommendation of award shall forfeit the right to continue the appeal process of the award of contract.

16.1.2 In the event a bidder determines cause to appeal an award of contract, which has been approved by the Board of Education of Baltimore County, said action must be filed in writing to the Executive Director, Division of Physical Facilities. This action shall occur not later than seven days from the date of award of contract. The Executive Director, Division of Physical Facilities reserves the right to meet with the protesting Bidder as a part of the appeal investigation. A formal written decision will be issued by the Executive Director, Division of Physical Facilities in a timely manner.

16.1.3 Should the Bidder wish to pursue the appeal of award of contract further, administrative procedures have been established for such action, which will be outlined at the time the appeal is made.

16.2 Appeal of Suspension or Termination.

16.2.1 Any Award Bidder objecting to their Suspension or Termination may protest the action to the Department of Physical Facilities by formally notifying the Executive Director, Department of Physical Facilities in writing within fourteen (14) calendar days from the date of the notification. The Award Bidder shall have an opportunity to meet with the Executive Director, Department of Physical Facilities, or his designee, to present his issues.

- 16.2.2 If the Award Bidder is unsatisfied with the outcome of this meeting, then the Award Bidder may utilize the administrative process to further the appeal.
- 16.3 BCPS reserves the right to proceed with the work under the contract during the appeal process if BCPS determines that this is in the best interest of BCPS, in the opinion of BCPS.
- 16.4 Appeal of Termination for Non-Appropriation of Funds or for loss of Appropriated funds: NONE
- 16.5 Any costs incurred in the appeal process will be borne by the bidder(s) in all instances.

17.0 LITIGATION PROCEDURES

- 17.1 All questions involving interpretation of the Contract Documents and of a value of less than \$10,000, which cannot be settled by agreement between the BCPS Project Manager and the Award Bidder shall be referred to the next highest department level manager for a decision. If the Award Bidder is not satisfied with the decision rendered, the matter shall, within thirty (30) days from that decision, the matter shall be referred to the Baltimore County Attorney or their designee sitting as Arbitrator with all of those rights, responsibilities, and duties mandated pursuant to Section 3-201, et seq., Court and Judicial Proceedings Article, Annotated Code of Maryland. Said decision rendered shall be final, subject only to Section 3-223 and 3-224, Court and Judicial Proceedings Article, Annotated Code of Maryland.
- 17.2 All questions involving interpretation of the Contract Documents which involve a value of \$10,000 or more, and cannot be resolved between the Award Bidder and BCPS Manager shall be referred to the Departmental Administrator for a review. If the Award Bidder is not satisfied with the decision rendered, the matter may be appealed to the BCPS, Department's Executive Director.
- 17.3 If the Award Bidder is unsatisfied with the decision of the Executive Director, then the Award Bidder may utilize administrative procedures established by the Board of Education for such action.
- 17.4 Waiver of Jury Trial

The Vendor and board hereby waive trial by jury in any action or proceeding to which the board and/or the Vendor are parties arising out of or in any way pertaining to this agreement. It is agreed and understood that this waiver constitutes a waiver of trial by jury of all claims against all parties to such actions or proceedings, including claims against parties who are not parties to this agreement. This waiver is knowingly, willingly and voluntarily made by the board and the Vendor and the board and the Vendor hereby represent and warrant that no representations of fact or opinion have been made by an individual to induce this waiver of trial by jury or to in any way modify or nullify its effect. The board and the Vendor further represent and warrant that they have been represented or

have had the opportunity to be represented, in the signing of this agreement and in the making of this waiver by legal counsel, selected of their own free will, and that they have had the opportunity to discuss this waiver with counsel.

18.0 DISCRIMINATION

- 18.1 The Award Bidder will not discriminate against any employee or applicant for employment because of race, creed, color or national origin. The Award Bidder will take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, creed, color or national origin. Such action shall include but not be limited to the following: employment, upgrading, demotion or transfer; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Award Bidder agrees to post in conspicuous places, available to employees and applicants, notices provided by the BCPS setting forth the provisions of this nondiscrimination clause.
- 18.2 The Award Bidder 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 by the BCPS advising the said labor union or workers' representative of the Award Bidder's commitments under this section, and the Award Bidder shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- 18.3 The Award Bidder shall furnish, if requested by BCPS, a compliance report concerning their employment practices and policies in order for BCPS to ascertain compliance with the special provisions of this contract concerning discrimination in employment.
- 18.4 In the event the Award Bidder is deemed noncompliant with the nondiscrimination clause of this contract, this contract may be canceled, terminated or suspended in whole or in part and the Award Bidder may be declared ineligible for further/future BCPS' work.
- 18.5 The Award Bidder shall include the special provisions outlined herein, pertaining to nondiscrimination in employment in every subcontract or purchase order utilized by him in order to carry out the terms and conditions of this contract, so that such nondiscrimination in employment provisions shall be binding on each Subcontractor.

19.0 GENERAL CONTRACT CONDITIONS

The standard printed form A-201, General Conditions of the American Institute of Architects, current edition, will form the General Conditions of the contract.

20.0 BUY AMERICAN STEEL ACT

Bidders shall comply in every respect with Article 21, Section 17 – 301 to Section 17 – 306, Annotated Code of Maryland.

21.0 AMERICAN DISABILITIES ACT

BCPS routinely opens all sealed bids in a public setting identified within the language of each specification. If a prospective bidder has special needs, the bidder shall contact the BCPS at least seventy-two (72) hours in advance of the published bid opening date and time to arrange for such services.

22.0 NON-HIRING OF EMPLOYEES BY AWARD BIDDER OR BCPS

22.1 No employee of the BCPS or any unit thereof, whose duties as such employee include matters relating to or affecting the subject matter of this contract, shall, while so employed, become or be an employee of the party or parties hereby contracting with the BCPS or any unit thereof.

22.2 No employee of the Award Bidder or any unit thereof, whose duties as such employee include matters relating to or affecting the subject matter of this contract, shall, while so employed, become or be an employee of the party or parties hereby contracting with the Award Bidder or any unit thereof.

23.0 FINANCIAL DISCLOSURE

The Award Bidder shall comply with the provisions of Section 13-221 of the State Finance and Procurement Article, Annotated Code of Maryland, which requires that every business that enters into contracts, leases or other agreements with the State of Maryland or its agencies during a calendar year under which the business is to receive in the aggregate \$100,000 or more, shall within 30 days of the time when the aggregate value of these contracts, leases or other agreements reached \$100,000, file with the Secretary of State of Maryland certain specified information to include disclosure of beneficial ownership of the business.

24.0 POLITICAL CONTRIBUTION DISCLOSURE

The Contractor shall comply with the provisions of the Election Law Article §§14-104 through 14-108 of the Annotated Code of Maryland, which require that every person that enters into contracts, leases, or other agreements with the State of Maryland, including its agencies or a political subdivision of the State, during a calendar year under which the person receives in the aggregate \$100,000 or more, shall file with the Secretary of State of Maryland certain specified information to include disclosure of political contributions in excess of \$500 to a candidate for elective office in any primary or general election, as required by §14-104.

25.0 RETENTION OF RECORDS

The Award Bidder shall retain and maintain all records and documents relating to this contract for three (3) years after final payment by BCPS hereunder or any applicable statute of limitations, whichever is longer, and shall make them available for inspection and audit by authorized representatives of BCPS or designed, at all reasonable times.

26.0 ANNULMENTS AND RESERVATIONS

- 26.1 BCPS reserves the right to reject any or all proposals and re-advertise for other bids.
- 26.2 BCPS reserves the right to waive technical defects within submittals.
- 26.3 BCPS reserves the right to order the said equipment, materials, supplies or services as described within the specifications, and also reserves the right not to order any.
- 26.4 BCPS may conduct any necessary investigation to determine the ability of the bidder to perform the work, and the bidder shall furnish to the BCPS all such information and data requested. BCPS reserves the right to reject any proposal if the evidence submitted by the bidder or investigation of such bidder fails to satisfy BCPS that such bidder is properly qualified to carry out the obligations of the Contract and to complete all stipulated requirements. Conditional proposals will not be accepted.
- 26.5 BCPS reserves the right to annul any contract, if in its opinion there shall be a failure, at any time, to perform faithfully any of its stipulations, or in case of any willful attempt to impose upon BCPS, materials, products and/or workmanship inferior to that required by the Award Bidder, and any action taken in pursuance of this latter stipulation shall not affect or impair any rights or claims of BCPS to damages for the breach of any covenant of the contract by the Award Bidder.
 - 26.5.1 Should the Award Bidder fail to comply with the conditions of this contract or fail to complete the required work within the time stipulated in the contract, except for circumstances beyond their control, including but not limited to Act of GOD, war, flood, governmental restrictions or the inability to obtain transportation, BCPS reserve the right to purchase these in the open market, or to complete the required work and receive liquidated damages as specified in this document.
 - 26.5.2 Should the Award Bidder be prevented from furnishing any item or items, or from completing the required work included in the contract, by reason of such failures caused by circumstances beyond their control, including but not limited to Act of GOD, war, flood, governmental action or the inability to obtain transportation, BCPS reserve the right to withdraw these from the operation of this contract without incurring further liabilities.
- 26.6 BCPS reserves the right to issue Blanket Purchase Orders to encumber, i.e. make available without obligating to spend, certain monies for Award Bidder's services. The Blanket Purchase Order dollar value does not in any way represent a guarantee of potential contracts, jobs, work assignments or monies during the course of the contract. The allocation of funds is at the discretion of BCPS.

- 26.7 BCPS reserves the right to discussions resulting in best and final offers.
- 26.7.1 Based on the Evaluation Committee's initial review of the proposals, the issuing office may invite, without cost to BCPS, ranking finalists to make a presentation of their proposal and their capabilities as further consideration in the selection process. BCPS reserves the right to recommend a Bidder for contract award on the basis of initial proposals without discussions or negotiations. However, Bidders should not rely on having an opportunity, during any negotiation, to change their offer. Discussions or negotiations may be conducted with all responsible Bidders whose proposals are initially classified as reasonably acceptable for award.
- 26.7.2 Should BCPS determine that further discussions would be in the best interests of the BCPS, the Purchasing Agent shall establish procedures and schedules for conducting discussions and will notify qualified Bidders.
- 26.7.3 When in its best interest, BCPS may permit all responsible offers whose proposals are classified as reasonably susceptible for award to revise their initial proposal by submitting Best and Final Offers.
- 26.8 Licenses for boilers, equipment or buildings are the responsibility of BCPS and shall not be part of this Agreement.
- 26.9 BCPS shall have the right to reject any or all Bids, reject a Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or reject a Bid which is in any way incomplete or irregular.

27.0 DELIVERY REQUIREMENTS

- 27.1 All deliveries must be scheduled, received and will be the responsibility of the Award Bidder and deliveries by "Drop Shipment" from other sources will not be accepted by BCPS.
- 27.2 All supplies and/or materials must be held by the Award Bidder until needed at the site, unless they can be stored in the area in which the work is to be done and that area has been closed to occupant usage. The Award Bidder shall obtain the permission of the using institution's representative regarding any needed storage of materials and equipment. Such storage shall be done in such a manner as not to interfere with the building schedule. The Award Bidder shall be responsible for any and all accidents caused by negligence from this source. BCPS does not accept responsibility for losses of material or equipment, regardless of approval to store, in any institution's facilities or grounds.

28.0 INSPECTIONS

- 28.1 BCPS reserves the right to have inspectors on the premises of the manufacturer during the process of manufacture of any products being furnished under this contract for as long as may be considered necessary by BCPS. All expenses of the inspectors shall be borne by BCPS.

- 28.2 The presence of the inspectors at the site of manufacture of the products shall not relieve the Award Bidders of responsibility for faulty workmanship of materials which may be discovered at any time after delivery and prior to final acceptance in accordance with the specifications. In case of factory inspection of items being manufactured for BCPS, every facility shall be afforded inspectors by the manufacturers for the prosecution of their work.

29.0 COMPLIANCE WITH SPECIFICATIONS

- 29.1 The bidder shall abide by and comply with the true intent of the specifications and not take advantage of any unintentional error or omission, but shall fully complete every part as the true intent and meaning of the drawings and specifications as described.
- 29.2 The Award Bidder, after award and prior to starting work may be required to submit working drawings or detailed descriptive data identified as acceptable to BCPS, which provide sufficient data to enable BCPS to judge the Award Bidder's compliance with the specifications.
- 29.3 Where the requirements of the specifications call for higher grade and are not in conflict with the laws, ordinances, etc., the specifications shall govern.
- 29.4 Where the requirements of the laws, ordinances, etc., are mandatory, they shall govern.
- 29.5 In case of any apparent conflict between the specifications and such laws, ordinances, etc., the Award Bidder shall call the attention of the applicable BCPS designee(s) to such conflict for a decision before proceeding with any work.

30.0 GUARANTEE AND WARRANTY

- 30.1 The Award Bidder shall unconditionally guarantee the materials and workmanship of all equipment and materials furnished by the Contractor, its subcontractors or suppliers for a period of at least TWO (2) YEARS from the date of acceptance and/or substantial completion of the installation by BCPS. If the manufacturer warrants equipment for a period longer than two years the Contractor shall pass through this time frame to BCPS. All warranty work shall be accomplished to the satisfaction of the owner within SEVENTY TWO (72) HOURS of notification of the work to be done.
- 30.2 In the event the Award Bidder fails to repair, replace, adjust, rectify, remedy, correct or complete the items, defects, deterioration, faulty design or installation and/or un-workmanlike performance, then BCPS may have the right to secure the services of another contractor to correct the work or complete the performance required by the award of this bid. The Award Bidder shall be solely responsible for any (and all) cost, expenses and monies due the new contractor plus ten percent (10%) for BCPS to reimburse the Board for the expenses of obtaining a new contractor.
- 30.3 The Award Bidder must act as the manufacturer's agent for all warranty claims.

31.0 SUBCONTRACTORS

- 31.1 All subcontractors, prior to their use by the Award Bidder in any BCPS facility, must be approved by BCPS. Award Bidder shall submit with their bid a list of subcontractors that they will employ and utilize for BCPS work. The responsibility for updating this list is the Award Bidders and utilization of a BCPS non-approved subcontractor is grounds for suspension or termination.
- 31.2 The Award Bidder shall give their constant personal attention to the faithful execution of this contract, shall keep the same under their own control, and shall not assign by power of attorney or otherwise, the work or any part thereof without the previous written consent of Coordinator of Purchasing. The Award Bidder shall provide the name of the subcontractor(s) he intends employing, the portion of the materials/labor to be furnished, their place of business, and such other information as requested by the bid specifications and/or BCPS. The information may be used in considering the potential performance capabilities of the subcontractor(s).
- 31.3 The Award Bidder shall not, without prior written consent of BCPS, assign any of the moneys payable under the contract.

32.0 AWARD BIDDER'S RESPONSIBILITY

- 32.1 Award Bidders shall be required under Article 56, Section 270(4), of the Annotated Code of Maryland, to provide proof of Certificate of Registry.
- 32.2 Award Bidders are responsible to protect all existing and newly installed work, materials, equipment and landscaping. Any BCPS property damaged shall be replaced or repaired to the satisfaction of BCPS.
- 32.3 Award Bidders are responsible for having all employees sign-in and sign-out at the work site. Use the appropriate form provided by the school office.
- 32.4 Award Bidders are responsible for daily removal of all debris from the work site and to keep the work site tidy as work progresses. Under no circumstance shall Award Bidders use BCPS garbage and/or recycling dumpsters to dispose of debris.
- 32.5 At no cost to the Award Bidder, BCPS shall provide and pay for water, heat, telephone and utilities used or consumed by the Award Bidder during the performance of the work or services hereunder if they are currently available at the work site. However, the Award Bidder shall install and pay for the costs of any temporary facilities not already in existence that will be required during construction for accessing such water, heat and utilities.
- 32.6 Award Bidders are responsible for coordinating planned interruptions of utility service with BCPS.
- 32.7 Award Bidders are responsible to notify BCPS of any occurrence of pre-existing condition that would prevent the completion of work as Specified. Any changes

in the scope of work and any resulting changes in cost shall be agreed to in writing by BCPS. BCPS assumes no responsibility for verbal changes in the scope of work or cost.

- 32.8 Award Bidders may be responsible at the discretion of BCPS to complete the American Institute of Architects (AIA) Abbreviated form of Agreement Between BCPS and Award Bidder.
- 32.9 Award Bidders are responsible to provide their own materials, tools and equipment. BCPS assumes no responsibility for vandalism or theft of Award Bidder s property.
- 32.10 At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Solicitation, Specification, Plans and Contract Documents (including all Addenda). The failure or omission of any bidder to receive or examine any form, instrument, or document, shall in no way relieve any bidder from any obligation in respect of his bid.
- 32.11 Award Bidder shall be responsible for ensuring that employees assigned to BCPS sites, either employed by Award Bidder or their Sub-contractor(s), have successfully passed a criminal background check. The Award Bidder shall advise the BCPS of the intention to use any employees, including sub-contractor employees that are hired or obtained from any penal pre-release or work-release programs. In the event such employees are used, notification to BCPS shall include name and violation for each individual. The contractor shall take reasonable precautions when selecting such individuals and provide whatever safeguards are necessary for effective supervision. Such employees are not permitted inside school buildings when the nature of the contract is for outside work.
- 32.12 In accordance with Board of Education Policy 3231 and Superintendent's Rule 3231, the effective management of vendors conducting business with the Baltimore County Public Schools includes a process to evaluate vendor performance under a contract for the purchase of goods, performance of service, consulting, construction, construction management, building renovation, or improvement of facilities. The results of vendor performance appraisals may be used in subsequent evaluations of a vendor's ability to perform on future contracts. Vendors should receive feedback on their performance, whether it is positive or negative. In the case of negative feedback, the vendor shall be informed of why their performance is unsatisfactory and what corrective action is required.

Vendor performance evaluations are required for all BCPS contracts for construction, construction management, building renovation, or facility improvement that exceed \$500,000. Vendor performance evaluations shall be completed by the Office of Physical Facilities during the contract, and a final evaluation shall be prepared within 30 days of substantial completion of the contract. More frequent evaluations may be submitted if necessary to facilitate proper management of the vendor. The Office of Purchasing may request a vendor performance evaluation for any contract with a value less than \$500,000.

For large, long-term projects, BCPS may use an internet and email based system to collect evaluations from key participants (vendors, contractors, subcontractors, designers, etc.) on its projects. This system is designed to facilitate open, detailed communication about any technical, communications, administrative or management issues that arise during the course of the contract, as well as to insure that potential problems are specifically identified and addressed as early in the contract period as possible (See PART II: SPECIFICATIONS--GENERAL REQUIREMENTS for further guidance).

- 32.13 Award Bidders must submit semi-annual statistical reports via email in an Excel format prescribed by BCPS for the periods of January to June and July to December each year. Reports are due, without notice, to BCPS on August 1 and February 1, respectively, following the end of each six-month period. Failure of the BCPS to remind Award Bidders that the reports are due does not relieve the BCPS of the responsibility of submitting the reports on time. The semi-annual reports must show the dollars spent in connection with this contract by the participating entities and may show other reporting categories mutually agreed upon by BCPS and Award Bidders. Failure to submit the reports on time may constitute unsatisfactory performance under the terms of the contract.

33.0 SAFETY AND CODE REQUIREMENTS

All materials and labor shall comply with the following requirements:

- 33.1 Award Bidder shall comply with all Federal, State, and Local laws, ordinances and regulations pertaining to work under their charge and these shall be construed as the minimum requirements of these specifications.
- 33.2 Award Bidder certifies that their firm adheres to or follows non-discriminatory practices with respect to the employment of promotion of personnel without regard to color, creed, race, sex, or national origin.
- 33.3 Award Bidder shall provide all equipment and machinery furnished and delivered to BCPS complying with the Safety regulations as required by OSHA and the Maryland State Safety Health Act known as MOSHA meeting the CFR-1910 MOSH Standard.
- 33.4 Award Bidder shall submit Material Safety Data Sheets (MSDS) for all supplies, materials, equipment or any other substances furnished and/or installed under this proposal in accordance with OSHA Hazardous Communication Standard 29 CFR 1910.101, 29 CFR 1910.1200 and 29 CFR 1926.58 or any other applicable state, federal, or local regulation. The Award Bidder must submit MSDS sheets to each school or facility that receives any such supplies, materials, equipment or any other substances furnished and/or installed by the Award Bidder. Failure on the part of the Award Bidder to furnish the necessary MSDS sheets will result in the withholding of final payment.

33.5 Standards are as defined in the latest issue from the following:

AABC	Associated Air Balance Council
ADC	Air Diffusion Council
AGA	American Gas Association
ADA	American's With Disabilities Act
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BOCA	Building Officials and Code Administrators
COBA	Council of American Building Officials
CPSC	Consumer Product Safety Commission
CS	Commercial Standard
FM	Factory Mutual
IBR	Institute of Boiler and Radiator Manufacturers
IEEE	Institute of Electrical and Electronics Engineers
MSSP	Manufacturers Standards Society of the Valve and Fittings Industry
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
TEMA	Tubular Exchanger Manufacturers Association
TIMA	Thermal Insulation Manufacturers Association
UL	Underwriters Laboratories

33.6 No new, replacement or restoration materials shall contain asbestos or asbestiform minerals in an amount greater than 0.0% as determined by polarized light microscopy (PLM) as prescribed in Federal Regulation 40 CFR 763.87. For ceiling tile and materials that are tightly bound (e.g. floor tile, roofing asphalt and felts, adhesive/mastic, caulk, glaze, etc.) and for which PLM analysis is not conclusive, transmission electron microscopy must be used for analysis. If no commercially available material meets this criterion, written authorization for use of the material shall be obtained from the BCPS Project Manager. All materials delivered to or used on BCPS property must be accompanied by a manufacturer's certification to be asbestos free, based upon criterion above. The Material Safety Data Sheet may not be used for this purpose.

33.7 No new, replacement or restoration materials shall contain lead in an amount greater than 0.00 milligrams per liter or 0.00 milligrams per kilogram. If no commercially available material meets either criterion, written authorization for use of the material shall be obtained from the BCPS Project Manager.

- 33.8 All Baltimore County codes and regulations including the latest edition of the International Building Code are relevant.
- 33.9 Public Law 91-596 dated December 29, 1970, entitled Occupational and Health Act of 1970.
- 33.10 Award Bidder shall insure that all modifications address the provisions of the ADA.

34.0 CONCEALED OR UNKNOWN CONDITIONS

In the performance of any work or services, if the Award Bidder encounters conditions at the Facilities that are (1) subsurface if otherwise concealed physical conditions that differ materially from those indicated on the drawings furnished by BCPS or (2) unknown physical conditions of an unusual nature that differ materially from those conditions normally found to exist and generally recognized as inherent in the construction activities if the type and character as that which is described, then the Award Bidder shall notify BCPS of such conditions promptly, prior to significantly disturbing the same, and in no event later than two (2) days after the first observation the conditions. If such conditions differ materially and cause an increase or decrease in the Award Bidder's cost of, or time required for, performance of any part of the work or services, the Award Bidder shall be entitled to, and BCPS shall consent in writing to, an equitable adjustment in the amounts paid to the Award Bidder pursuant to this Agreement, the times for performance or both.

35.0 INDEMNIFICATION

- 35.1 To the fullest extent permitted by law, the Award Bidder shall indemnify and hold harmless the Baltimore County Public Schools and the Baltimore County Board of Education and its officials and employees, Construction Manager, Architect, Construction Manager's and Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses including, but not limited to, attorneys' fees, arising out of or resulting from performance of the Work but only to the extent caused in whole or in part by negligent acts or omissions of the Award Bidder, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be constructed to negate, abridge or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described within this indemnification.
- 35.2 In claims against any person or entity indemnified within this indemnification by an employee of the Award Bidder, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Award Bidder or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

- 35.3 The obligations of the Award Bidder within this indemnification shall not extend to the liability of the Construction Manager, Architect, their consultants and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or specifications, or (2) the giving of or the failure to give directions or instructions by the Construction Manager, Architect, their consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.
- 35.4 Baltimore County Public Schools shall not be responsible for errors or omissions made by the printer or advertising house which prepared the Bid Documents, addenda, or advertising services. If bidders or advertising houses suspect that their set of bidding documents is incomplete or defective, they should contact the Office of Purchasing, immediately.

36.0 EXCLUSIONS FROM WORK

BCPS acknowledges and agrees that the Award Bidder's obligation to furnish equipment and perform construction work or otherwise modify the Facilities, is limited to the work as defined on an individual site basis as determined by BCPS.

37.0 ACCESS TO FACILITIES FOR PERFORMANCE

From the date hereof and throughout the term of this agreement, the Award Bidder shall have reasonable access to the Facilities and relevant personnel of BCPS to perform its obligations and to investigate performance of the equipment, systems and operations of the Facilities.

38.0 LIABILITY FOR LOSS OF DATA

In the event of loss of data or any data or record necessary for the performance of this Agreement where such loss is due to gross negligence of the Award Bidder, the Award Bidder shall be responsible, irrespective of the cost to the Award Bidder, for the recreation of such lost data or records. BCPS shall be the sole judge as to whether the lost records have been recreated accurately and completely.

39.0 SUSPENSION OF WORK

- 39.1 BCPS may unilaterally order the Award Bidder in writing to suspend, delay, or interrupt all or any part of the work for such period of time as may be appropriate for the convenience of the BCPS. Such suspensions, delays or interruptions should be for less than sixty (60) days unless there are extenuating circumstances.
- 39.2 The times required and the completion of work shall be equitably adjusted to take into account the period of such suspensions, delay or interruption.
- 39.3 BCPS will compensate the Award Bidder only for the cost(s) to re-mobilize to the Facilities any equipment that had to be leased or rented for the suspension period that was critical to the operation of the Facility and any offsite storage cost(s) besides the Award Bidder's facility that had to be used to store materials

related to the work. The Award Bidder shall, at the suspension of work, notify the BCPS of any such charges stating the monetary damages that will incur and shall document weekly in writing to the BCPS the cumulative costs during the delay period. In no way will any approved delay effect the warranty period regarding any accepted completion by the BCPS relating to equipment installed by the Award Bidder, its subcontractors and suppliers.

40.0 DELAYS, EXTENSIONS OF TIME

- 40.1 The Bidder agrees to perform all work and provide all supplies or materials, in accordance with all the sections of this bid in a timely, continuous and diligent manner in order to comply with the time requirements set forth in this bid and/or the contract. The Bidder acknowledges and agrees that the only party that may grant a legally binding time extension or agree to a substitution of products, materials, equipment and/or supplies is BCPS. Any and all time extensions and/or changes/substitutions of products, materials, equipment and/or supplies must be requested in writing by the Bidder before the extension and/or change takes place and approved in writing by BCPS.
- 40.2 Delays by the Award Bidder causing the completion of Projects to extend past the Commencement Date will not change the Commencement Date for Performance guarantee purposes.

41.0 HAZARDOUS MATERIALS

- 41.1 The Award Bidder's work and other services pursuant to or in connection with this Agreement includes work connected and associated with asbestos, lead, polychlorinated biphenyl ("PCB"), fluorescent light bulbs, or other hazardous materials (hereinafter, collectively, "Hazardous Materials"). The Award Bidder shall be required to perform identification, abatement, cleanup, control, and removal of Hazardous Materials. BCPS warrants and represents that, except as set forth in the Technical Proposal, there are no Hazardous Materials on the Facilities that will in any way affect the Award Bidder's work or any other services and BCPS has disclosed to the Award Bidder the existence and location of any Hazardous Materials in all areas within which the Award Bidder will be performing any part of the work or other services. The existence or location of any Hazardous Materials that have been disclosed by BCPS to the Award Bidder prior to the execution hereof, or that were otherwise identified in the Technical Specifications, shall be the exclusive responsibility of the Award Bidder.
- 41.2 Should the Award Bidder become aware of or suspect the presence of Hazardous Materials, other than already disclosed by BCPS within the Technical Specifications, the Award Bidder shall immediately stop work in the affected area and notify BCPS. BCPS will be responsible for taking any and all actions necessary to correct the condition in accordance with all applicable laws and regulations. The Award Bidder shall be required to resume performance of the work or any BCPS requested work in the affected areas only in the absence of Hazardous Materials or when the affected area has been rendered harmless. Except as set forth in the Technical Specifications, the Award Bidder shall not be obligated to transport or handle Hazardous Material, to provide any notices to

any governmental authority or agency, or to inspect or examine the Facilities for the presence of Hazardous Material.

42.0 BIDDER SUBMITTALS

42.1 BIDDERS MUST SUBMIT THE FOLLOWING:

42.1.1 Award Bidders providing skilled labor that requires certification from a local, state, or federal agency, shall provide proof of certification indicating the date of expiration and retain certification for the duration of this contract **within ten (10) business days of being notified of being the apparent award bidder.** The Insurance Certificate must name the **"Board of Education of Baltimore County" as the "additional insured"**.

42.1.2 Award Bidder's must provide a certificate of insurance evidencing Worker's Compensation and Employer Liability Insurance in the amounts required above, and in addition, this certificate will indicate the amounts of insurance carried by the Award Bidder of the following types **within ten (10) business days of being notified of being the apparent award bidder:**

Comprehensive General Liability Insurance

Comprehensive Automobile Insurance

Excess Liability Insurance

and any other insurance coverage maintained by the Award Bidder

The Certificates of Insurance will state that such insurance is in force and cannot be cancelled or released except upon thirty (30) days prior written notice to the Board of Education of Baltimore County.

42.1.3 Award Bidders shall be required under Article 56, Section 270(4), Annotated Code of Maryland, to provide proof of Certificate of Registry and must be licensed to do business in the State of Maryland and provide a tax certification number **within ten (10) business days of being notified of being the apparent award bidder.** Visit the following website to ensure compliance:

<http://www.dat.state.md.us/sdatweb/charter.html>

42.1.4 Award Bidders who cannot provide evidence of having the personnel and equipment to satisfactorily provide the required services in a safe and timely fashion, as determined using criteria developed by BCPS and not necessarily industry standards, will be found to be non-responsive and have their bid rejected. Additionally, BCPS will consider the Award Bidder's equipment for size, suitability to do the work, condition of equipment, attachments required to do the work. Safety is a primary concern and safety related attachments are required by BCPS. It is the Award Bidders responsibility to supply this information to BCPS with their submittal.

42.2 Prior to the award of the Contract the Bidder will be notified in writing if either BCPS or Architect, after due investigation, has reasonable objection to a person

or entity proposed by the Bidder. If BCPS or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid, or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. BCPS may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

43.0 SUBSTITUTIONS

Bids shall be based upon the materials, systems, and equipment required by the bidding documents without exception. Where a specific manufacturer or trade name is designated, it is to establish a standard of material, design function, finish and quality. Only products of the named acceptable manufacturers and "or equal" (in quality, accessories, and attachments) are to be used in the Bid. Other products which will perform equally will be considered providing Bidder makes a submittal for substitution in strict accord with, Division 1 of the Technical Specifications - "Substitutions." The Contract award will be made solely on the basis of the Base Bid and Alternate Bids without regard to proposed substitutions and deducts when requested. Proposed substitution may be accepted with the award of the Contract or later by BCPS. After the Contract Award, substitutions will be considered and reviewed by the Consultant who will make acceptance or rejection recommendation to BCPS. The burden of proof of equivalency rests with the Award Bidder and evidence of such equivalency shall be submitted to the Consultant. If the bidder wishes to offer a substitute, the bidder should do so in accordance with subparagraph 43.2.

Proposed substitute products or manufacturers shall be submitted in accordance with the following provisions:

- 43.1 Substitutions will be considered prior to the initial advertisement for bids and after receipt of bids.
- 43.2 Bidders must submit a substitutions statement for the materials, systems and equipment specified with their bid and specification sheets showing and telling exactly where and how the bid does deviate from said specifications, and if in fact it does deviate in any respect, along with any stipulated cost adjustment (add, deduct, or no change) in the space provided on the Form of Proposal.

44.0 EMERGENCIES AND NOTIFICATION

In any case of an emergency the Award Bidder shall immediately notify the Architects, Construction Manager and BCPS by the most expeditious means available. Follow by telegram or written notice, explaining the situation and actions taken. Additional compensation or extension of time will not be considered or permitted for emergencies arising from delay, damage, or loss.

45.0 OWNER'S RIGHT TO STOP THE WORK

- 45.1 If the Award Bidder fails to correct Work which is not in accordance with the requirements of the Contract Documents or persistently fails to carry out Work in accordance with the Contract Documents, BCPS, by written order signed

personally or by an agent specifically so empowered by BCPS in writing, may order the Award Bidder to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however the right of BCPS to stop the Work; shall not give rise to a duty on the part of BCPS to exercise this right for the benefit of the Award Bidder or any other person or entity. This right shall be in addition to and not in restriction or derogation of the Owner's rights under the General Conditions.

- 45.2 If unforeseen conditions occur or are encountered which may substantially impair the quality of the Work unless the Work is suspended, BCPS may, with the written concurrence of the Architect, suspend the Work by notice in writing to the Award Bidder, the Contract Management, and Architect. In the event of such a suspension, the Award Bidder shall be entitled to only adjustments in the Contract Time and an adjustment in the Contract Sum for costs actually incurred at the Project site by reason of such suspension. In any event where the Award Bidder reasonably determines that a suspension is required in such circumstances, the Award Bidder shall promptly notify in writing BCPS and Architect of such determination.

46.0 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Award Bidder defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven day period after receipt of written notice from BCPS to commence and continue correction of such default or neglect with diligence and promptness, BCPS may after such seven day period give the Award Bidder a second written notice to correct such deficiencies within a second seven day period. If the Award Bidder within such second seven day period after receipt of such second notice fails to commence and continue to correct any deficiencies, BCPS may, without prejudice to other remedies BCPS may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Award Bidder the cost of correcting such deficiencies, including compensation for the Construction Manager's and Architect's and their respective consultants' additional services and expenses made necessary by such default, neglect or failure. If payments then or thereafter due the Award Bidder are not sufficient to cover such amounts, the Award Bidder shall pay the difference to BCPS.

47.0 ROYALTIES AND PATENTS

The Award Bidder shall pay all royalties and license fees. The Award Bidder shall defend suits or claims for infringement of patent rights and shall hold BCPS, Construction Manager, and/or the Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design process or product of a particular manufacturer or manufacturers is required by the Contract Documents. However, if the Award Bidder has reason to believe that the required design process or product is an infringement of a patent, the Award Bidder shall be responsible for such loss unless such information is promptly furnished to BCPS and/or the Architect.

48.0 CONFLICT OF INTEREST, LOBBYING, AND ETHICS REVIEW PANEL

- 48.1 In accordance with §5-815 through §5-820 of the General Provisions Article of the Annotated Code of Maryland, the Board of Education of Baltimore County has promulgated Ethics Policies, which cover conflict of interest, financial disclosure and lobbying. All bidders are expected to comply with any and all Board Ethics Policies that may apply to them individually or as a business entity.
- 48.2 All bidders should review carefully the conflict of interest policies. Specific attention should be accorded to the Board Ethics Policies (Board Policy 8363) prohibiting Baltimore County Public Schools employees from benefiting from business with the school system.
- 48.3 All bidders are placed on notice that all questions/interpretations concerning the Board Ethics Policies may be submitted to the Ethics Review Panel in accordance with Board Policy 8366.

49.0 INCLEMENT WEATHER

- 49.1 **PRE-BID:** If Baltimore County Schools are **closed** (either the "schools" and/or "offices") on the day a pre-bid is scheduled, **"THE PRE-BID IS CANCELLED"** and **will not be rescheduled unless an addendum is issued.** Bidders are advised that they are to email or FAX questions to the purchasing agent by the date and time required within this solicitation.
- 49.2 **BID OPENING:** If Baltimore County Schools "offices" are closed on the day a bid is "DUE", or prior to the due time, that **bid will be due at the same time the next day that the Baltimore County Schools "offices" are open.** The bid opening shall not be impacted if Baltimore County Schools "schools" are closed.
- 49.3 If Baltimore County Schools (either the "schools" and/or "offices") open late, due to inclement weather, the Bid Due Date and Time of Opening will be conducted AS SCHEDULED. If Baltimore County Schools "offices" close early, due to inclement weather, the Bid Due Date and Time of Opening will be conducted **at the same time the next day that the Baltimore County Schools "offices" are open.** If Baltimore County Schools "schools" close early, due to inclement weather, the Bid Due Date and Time of Opening will be conducted AS SCHEDULED.

50.0 ILLEGAL IMMIGRANT LABOR

The use of illegal immigrant labor to fulfill contracts solicited by BCPS is in violation of the law and is strictly prohibited. Contractors and subcontractors must verify employment eligibility of workers in order to assure that they are not violating Federal/State/Local laws regarding illegal immigration. A compliance audit may be conducted.

51.0 FOREIGN LANGUAGE TRANSLATOR REQUIREMENT

- 51.1 BCPS requires an Award Bidder that has an employee on site that does not speak English to have on site, full time, an interpreter that is fluent in speaking and understanding that employee's native language.
- 51.2 Failure of an Award Bidder to have on site, full time, an interpreter that is fluent in speaking and understanding an employee's native language for those employees that do not speak English is reason for immediate termination of the contract for cause.

52.0 EMPLOYMENT OF CHILD SEX OFFENDERS AND PERSONS WITH UNCONTROLLED ACCESS TO STUDENTS

- 52.1 Maryland Law requires certain child sex offenders to register with the State and with the local law enforcement agency in the county in which they will reside, work and/or attend school. Section 11-722(c) of the Criminal Procedure Article of the Annotated Code of Maryland states, "[a] person who enters into a contract with a County Board of Education or a non-public school may not knowingly employ an individual to work at a school if the individual is a registrant. A person who violates this section is guilty of a misdemeanor and on conviction is subject to imprisonment not exceeding five years or a fine not exceeding \$5,000 or both." If a child sex offender, sexually violent predator, or sex offender, as defined in the Criminal Law and Criminal Procedure Articles of the Annotated Code of Maryland, is employed by the Award Bidder, the Award Bidder is prohibited from assigning that employee to perform management, delivery, installation, repair, construction or any other type of services on any BCPS property, including the project property. Violation of this provision may result in immediate Termination for Cause.
- 52.2 Additionally, in accordance with Md. Ed. Code Ann., §6-113 (b), the Award Bidder and any of its subcontractors will not knowingly assign any employee to work on school premises with direct, unsupervised and uncontrolled access to children, if that employee has been convicted of a crime identified in Md. Ed. Code Ann., §6-113(a).

53.0 FORCE MAJEURE

Force Majeure is defined as an occurrence beyond the control of the affected party and not avoidable by reason of diligence. It includes the acts of nature, war, riots, strikes, fire, floods, epidemics, or other similar occurrences. If either party is delayed by force majeure, said party shall provide written notification to the other within 48 hours. Delays shall cease as soon as practicable and written notification of same provided. The time of contract completion may be extended by contract modification, for a period of time equal to that delay caused under this condition. BCPS may also consider requests for price increase for raw materials that are directly attributable to the cause of delay. BCPS reserves the right to cancel the contract and/or purchase materials, equipment or services from the best available source during the time of force majeure, and Contractor shall have no recourse against BCPS. Further, except for payment of sums due, neither party shall be liable to the other or deemed in default under this contract, if and to the

extent that such party's performance of this contract is prevented by reason of force majeure as defined herein.

54.0 ASSIGNMENT

The Award Bidder shall not assign or transfer the Award Bidder's interest or obligation under this Agreement to any third party, without the prior written consent of the Board. Nothing herein shall be construed to create any personal or individual liability upon any employee, officer, elected official of the Board, nor shall this Agreement be construed to create any rights hereunder in any person or entity other than the parties to this Agreement.

55.0 ACCESS TO PUBLIC RECORDS ACT NOTICE

The Board of Education of Baltimore County is subject to the Maryland Public Information Act, State Government Article § 10-611, et.seq. As a result, the Board may be required to disclose, upon request, certain public records. However the Act excludes from disclosure records that contain commercial information when the record is identified as: (1) a trade secret; (2) confidential commercial information; (3) confidential financial information; or (4) confidential geological or geophysical information.

If your bid documents contain any of the following classifications of records, you must note this specifically, on each relevant page that the document contains information that can be classified as confidential commercial, confidential financial information or a trade secret. Any pages that do not contain such a statement will be disclosed upon request under the Act.

56.0 CRIMINAL BACKGROUND CHECKS

56.1 Bidder's employees that have unsupervised or direct access to children or that are assigned duties in a school where unsupervised contact with children is likely, are required to be fingerprinted by BCPS and will complete the Background Investigation process with the exception of the I-9 form. The cost will be borne by the Award Bidder and all records will remain in the control and custody of the school system. The school system reserves the right to reject the Bidder's employees based on information received from said background investigations.

56.2 Bidder's employees who will work at facilities where no contact with children is anticipated are not required to be fingerprinted, however, such employees will complete the Background Check Application form and Authorization and Release for the Procurement of an Investigative Consumer Report. A Consumer Investigative Report (Commercial Background Check) will be prepared on each of these employees. The cost will be borne by the Award Bidder. Further instructions for this process will be provided to the Award Bidder.

END OF PART I: GENERAL TERMS AND CONDITIONS

BALTIMORE COUNTY PUBLIC SCHOOLS

DIVISION OF BUSINESS SERVICES
DEPARTMENT OF FISCAL SERVICES
OFFICE OF PURCHASING

6901 CHARLES STREET, BUILDING "E", 1ST FLOOR
TOWSON, MARYLAND 21204
PHONE 410-887-4334 FAX 410-887-7831

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PART II: SPECIFICATIONS--GENERAL REQUIREMENTS

(If there is a discrepancy between specifications of Part I: General Terms and Conditions **and** Part II: Specifications--General Requirements: **Part II specifications shall prevail**).

1.0 General Scope & Services

- 1.1 The specifications that follow are being offered to qualify and select trade contractors to provide specified services for the replacement of Victory Villa Elementary School for Baltimore County Public Schools (BCPS). The scope of work consists of, but is not limited to, construction of a replacement 735 seat elementary school.
- 1.2 The Award Bidder shall furnish all materials, supervision, labor, equipment and other facilities necessary and proper to properly provide these services in accordance with the specifications.
- 1.3 The purchase of these services are pending approval and allocation of funds by the Board of Education. BCPS reserves the right to award the contract as described in this specification in part or whole, and also reserves the right not to award a contract.
- 1.4 The requirements listed are intended as an aid to the bidder to acquaint him with what is required to execute the work on this contract. The bidder is responsible for site visitation, field measurements, and confirmation of existing conditions.
- 1.5 At the time of the opening of bids each bidder will be presumed to have read and be thoroughly familiar with the specifications and related documents (including all Addenda). The failure or omission of any bidder to receive or examine any form, instrument, or document, shall in no way relieve the bidder from any obligation in respect to this bid.
- 1.6 All proposals shall be submitted on the proposal form provided by BCPS. All blank spaces shall be filled in, in ink and properly signed.
- 1.7 This bid may be withdrawn at any time prior to the actual opening of the bids. No bidder may withdraw his bid within one-hundred twenty (120) calendar days after the actual date of the opening of bids under the same terms and conditions as included within this solicitation. The Owner retains the right to accept a bid within one-hundred twenty (120) calendar days of bid opening without an increase in bid price or change in time of Project completion.
- 1.8 All work must be approved by BCPS Department of Physical Facilities. BCPS reserves the right of final approval of all work at the time of job completion. If the work is not acceptable, the Award Bidder will be called in to review and correct all problem areas without additional cost to BCPS. Any repairs necessary will be performed in accordance with a schedule jointly agreed upon.
- 1.9 The Award Bidder shall comply with all current and applicable Baltimore County building, fire, plumbing, electrical and sediment control requirements, State codes, and Federal codes. Codes include International Building Code, NFPA, OSHA, MOSHA, ADA, federal accessibility guidelines, as well as applicable

environmental and health laws and regulations. Every effort is to be made to insure the safety of all individuals during work, as well as, during operation.

- 1.10 BCPS inspectors will make unannounced periodic inspection and observations of the work in progress. The Award Bidder shall contact BCPS, Department of Physical Facilities at least seven (7) days prior to beginning of work.
- 1.11 Upon approval by the Baltimore County Board of Education, BCPS will issue to the Award Bidder an American Institute of Architects (AIA) Contract Document (modified), herein after called the "Contract", for services requested within this solicitation. If Award Bidder fails to execute and deliver the signed Contract, Payment / Performance Bonds and Certificates of Insurance within ten (10) business days from receipt of the Contract, the security deposited with his bid shall be forfeited to the Owner as liquidated damages for such failure or refusal.
- 1.12 A bidder whose bid is withdrawn for any reason, or who fails to enter into a Contract, may be determined to be not responsible and not permitted to rebid the project and his Bid Bond will be forfeited. BCPS retains the right to consider bid withdrawals or requests for withdrawal in evaluating the Contractor's responsibility on future solicitations.
- 1.13 Any omissions, errors, conflicts, or discrepancies in this document shall be called to the attention of the BCPS immediately.
- 1.14 The Baltimore County Department of Public Works' cost group for the entire project is H: over \$15M.

2.0 Incorporation of Technical Specifications and Drawings

- 2.1 AIA Contract Documents are attached and are hereby made a part of the contract document.
- 2.2 The following lists the sections of the bid document in order of precedence, first to last:
 - .1 Technical Specifications, Divisions 00 through 16;
 - .2 Drawings;
 - .3 Part II: Specifications--General Requirements;
 - .4 Part I: General Terms and Conditions.

3.0 Qualification of Bidder

- 3.1 All bidders shall be pre-qualified by Baltimore County Department of Public Works (BCDPW), Contracts Division Category "I", Buildings, Classification Number 1 (Construction), prior to the date of bid opening.

- 3.2 All members of the contracting team must possess a current State of Maryland License for related work, prior to the date of the bid opening.
- 3.3 Copies of the bidder's Certificate of Prequalification, if required above, as issued by the BCDPW, shall be included in the proposal submitted to BCPS by the specified bid due date and time.
- 3.4 Baltimore County Department of Public Works (BCDPW) contact information:
Website address:
http://www.baltimorecountymd.gov/Agencies/publicworks/contracts/pw_contracts_prequal.html
Division of Construction Contracts Administration, Room 300B
111 West Chesapeake Avenue, Towson, Maryland 21204
Ms. M. Katherine McHenry. Phone: 410-887-4248
- Note: New contractors and existing contractors requesting additional categories should allow sixty (60) days for processing.
- 3.5 All Bidders are required to attempt to achieve the Minority Business Enterprise (MBE) subcontracting goals from certified MBE firms as specified herein. The complete list of certified MBE firms can be found at Maryland State Department of Transportation (MDOT) <http://mbe.mdot.state.md.us/directory/>.
- 3.6 Bidders shall include evidence that they maintain a permanent place of business, copies of any and all appropriate licenses necessary to perform this work with their proposal.
- 3.7 Bidders shall also provide at least three (3) names of contact persons and phone numbers, references of similar sized and scope contracts during the past eighteen (18) months.
- 3.8 In determining the qualifications of a bidder, BCPS will consider the bidder's record and performance of any prior contracts with BCPS. Failure of a Bidder to successfully complete a contract for BCPS, or failure of a Bidder to complete a contract for BCPS on time, is just reason for rejection of their bid. BCPS reserves the right to determine the actual qualifications of the apparent low bidder for this Project after consideration to the scope of the Project, the time required for completion, the competency and responsibility of the apparent low bidder, and the ability of the bidder to perform the Contract satisfactorily.
- 3.9 BCPS may conduct any necessary investigation to determine the ability of the bidder to perform the work, and the bidder shall furnish to BCPS all such information and data requested. BCPS reserves the right to reject any proposal if the evidence submitted by the bidder or investigation of such bidder fails to satisfy BCPS that such bidder is properly qualified to carry out the obligations of the contract and to complete all requirements contemplated therein. Conditional proposals will not be accepted.

- 3.10 Failure of a Bidder to successfully complete a contract or to complete a contract on time with any Federal departments or agencies, or with other public bodies, is just reason for rejection of the bid.
- 3.11 BCPS expressly reserves the right to reject the proposal of any bidders that, in the opinion of BCPS, has habitually and without just cause neglected the payment of bills or has otherwise disregarded their obligations to subcontractors, material suppliers or employees.
- 3.12 Consideration will be given to any previous performance with BCPS as to the quality and the acceptability of bidder's services. Unsatisfactory performance shall include, but not be limited to any one or more of the following:
 - .1 Failure of the company to provide all submittals as scheduled.
 - .2 Failure of the company to start a project on the date scheduled without having applied for and having received an extension of this date from BCPS. This shall include failure of the Award Bidder to order all required materials and/or equipment in a timely manner, especially those requiring a lengthy manufacturing period until delivery.
 - .3 Failure of the company to provide proper supervision at a site at all times. This individual shall be properly knowledgeable and experienced at supervising work of similar scope and have the authority to properly direct all work by all disciplines.
 - .4 Failure of the company to provide properly trained individuals to accomplish the work in a professional manner. This will also include: uniforms, clothing, conversations, and actions at the site.
 - .5 Failure of the company to provide an appropriate number of individual on site to perform the work required continuously throughout the contract.
 - .6 Failure of the company to do all work to meet and/or exceed the specifications without having to be instructed to make corrections repeatedly.
 - .7 Failure of the company to have the project completed by the date scheduled (without having applied for and received an extension of this date from BCPS, or, due to an unforeseen excessive amount of inclement weather.)
 - .8 Failure of the company to utilize sub-contractors that results in work not meeting and/or exceeding the specifications and/or not able to schedule their work to expedite the completion of the project. Note: Use of sub-contractors without the expressed written prior consent from BCPS is reason for termination of the contract immediately for cause.
 - .9 Failure of the company to properly protect BCPS property, employees, students, and/or the public.

- .10 Failure of the company to enter into a contractual agreement upon recommendation of award.
 - .11 Failure of the company to complete a project without having to execute a change order (other than for a change in the scope of work).
 - .12 Other criteria as determined to be of importance to BCPS for proper project execution.
- 3.13 A person convicted for bribery, attempted bribery, or conspiracy to bribe shall be disqualified from entering into a Contract with any county or other subdivision of the State.

4.0 Inspection of Site

- 4.1 Each bidder shall visit the site and become familiar with the local site conditions under which the Work is to be performed. Each bidder represents and warrants for himself, and any relevant Subcontractors he intends to employ on the Project, that he had observed all nature of the Work set out in the plans and specifications, that he has had opportunity to inquire about site conditions including public rights-of-ways and areas adjacent to the site which might affect the Work, and that he has prepared his proposal with requisite understanding of the Project and site conditions.
- 4.2 Failure to become familiar with the site will not relieve a successful bidder of his obligation to furnish all materials, labor, and services necessary to carry out the provisions of the plans and specifications and to complete the contemplated Work for the consideration set forth in his bid.
- 4.3 To aid Bidders with formulation of pricing associated with this solicitation, all Bidders are invited to visually inspect project site.
- 4.4 Site information:

Victory Villa Elementary School
500 Compass Road
Baltimore, Maryland 21220

5.0 Bonding and Certificates of Insurance

- 5.1 BID BONDS
 - 5.1.1 Each bid must be accompanied by a Bid Bond on an AIA Document A310 from a surety company acceptable to the Owner and authorized to transact surety business in the State of Maryland, properly executed in favor of the Owner for not less than five percent (5%) of the amount of the largest possible total of bids submitted, or a certified check. Power of Attorney, properly executed, shall accompany Bid Bond.
 - 5.1.2 The Bid Bonds will be returned upon request from the bidder within forty-eight (48) hours after the Owner and the accepted bidder have

executed the Contract. If no Contract has been executed within one-hundred twenty (120) calendar days after the opening of bids, the bidder may demand return of the Bid Bond any time thereafter so long as the firm has not been notified of the acceptance of its bid.

5.1.3 The bonding company furnishing the Bid Bond shall attach to the Bid Bond, or deliver to the Owner within two (2) working days of the bid opening, the following statement, signed by an authorized representative of the bonding company: "**As surety for the (Name of Contractor), (Name of Bonding Company) hereby agrees to furnish the 100 percent performance, labor and materials payment bonds, as required by the specifications for the CONSTRUCTION OF THE VICTORY VILLA ELEMENTARY SCHOOL REPLACEMENT, on behalf of the Contractor, in the event that such firm be the successful bidder for this project.**" and bond agreement outlined above if agreement is submitted separately.

5.1.4 The cost of this bond shall be included in the bid amount.

5.2 PERFORMANCE AND PAYMENT BONDS

- 5.2.1 Within ten (10) business days from receipt of the Contract, the Award Bidder shall deliver to the Owner two (2) copies each of the following on AIA Documents A312:
- .1 Performance Bond in the amount of one hundred percent (100%) of this Contract Price covering faithful performance of the Contract.
 - .2 Payment Bond in the amount of one hundred percent (100%) of his Contract Price as security for the payment of all persons performing labor and furnishing materials in connection therewith.
 - .3 Powers Of Attorney, properly executed, shall accompany bonds.
- 5.2.2 If Award Bidder fails to execute and deliver the signed Contract, Payment and Performance Bonds within ten (10) business days from receipt of the Contract, the security deposited with his bid shall be forfeited to the Owner as liquidated damages for such failure or refusal.
- 5.2.3 Performance bonds and payment bonds shall be made out in the name of the "**Board of Education of Baltimore County**", Attn: Contracting Assistant, 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204". Send or have delivered all, performance bonds, and payment bonds to the attention of:

**Baltimore County Public Schools
Patricia Onheiser, Purchasing/Contracting Assistant
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204**

- 5.2.4 The cost of these bonds shall be included in the bid amount.
- 5.2.5 It is imperative that the Bidder advise the bonding company that the Contract calls for a two (2) year contractor warranty period by the Award Bidder.

5.3 CERTIFICATES OF INSURANCE

5.3.1 Certificates of insurance shall be made out in the name of the "**Board of Education of Baltimore County**". The notification of any change in status of the insurance shall be provided to the **Contracting Assistant, 6901 Charles Street, Building "E", 1st Floor, Towson, Maryland 21204.**

- .1 Send or have delivered all certificates of insurance, to the attention of:

**Baltimore County Public Schools
Patricia Onheiser, Purchasing/Contracting Assistant
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204**

- .2 The Insurance Certificate must name the "**Board of Education of Baltimore County**" as the "additional insured".
- .3 The Certificates of Insurance cancellation notice shall read:

"Should any of the above described policies be cancelled before the expiration date thereof, the issuing company shall mail **thirty (30) days in advance of the cancellation date** notice to the certificate holder."

NOTE: ALL other wording shall be deleted.

- 5.3.2 If Award Bidder fails to execute and deliver the signed Contract and Certificates of Insurance within ten (10) business days from receipt of the Contract, the security deposited with his bid shall be forfeited to the Owner as liquidated damages for such failure or refusal.
- 5.3.3 Cost of Insurance shall be included in the bid amount.
- 5.3.4 The Award Bidder shall maintain the insurance coverage's required by the Board while this agreement is in force, and provide documentation of such insurance in a form satisfactory to the Board.

6.0 **Certified Minority Business Enterprises**

- 6.1 Certified Minority Business Enterprises are encouraged to respond to this solicitation notice.

- 6.1.1 The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the result that a percent of the total contract value is with certified Minority Business Enterprises, with a corresponding minimum percent from certified African American-owned businesses, a corresponding minimum percent from certified Asian American-owned businesses, and the balance from any certified Minority Business Enterprises. All contractors, including certified MBE firms, when submitting bids or proposals as prime contractors, are required to attempt to achieve the MBE goal and sub-goals, if applicable, from certified MBE's. Contractors should utilize the "MDOT Directory of Certified MBE and/or DBE firms" for selecting certified MBE's. The directory can be accessed at the following website: http://mbe.mdot.state.md.us/directory/search_select.asp
- 6.1.2 Each bid or offer submitted, including a submittal from a certified MBE in response to this solicitation, shall be accompanied by a completed Attachment A - Certified MBE Utilization and Fair Solicitation Affidavit and a completed Attachment B - MBE Participation Schedule. These two attachments must be accurate and consistent with each other.
- .1 Attachment A and Attachment B shall be submitted with the sealed bid price or proposal at a place, date, and time specified in the solicitation document.
- .2 As an alternative, and at the discretion of the school system, Attachment A could be submitted with the sealed bid price or proposal at a place, date, and time specified in the solicitation document. The sealed bids or proposals received by the time specified could be held, unopened for a maximum of 30 minutes. Within that time (30 minutes) each bidder or offeror must submit Attachment B, in a separate sealed envelope. The sealed price envelopes from each bidder or offeror who submits both the sealed bid, or proposal, and the envelope with Attachment B will then be opened and reviewed and recorded as a viable submission. Any contractor that fails to submit the second envelope, with Attachment B, prior to the specified time allowed (30 minutes) after the submittal of the sealed bid or proposal will be deemed non-responsive and the sealed bid or proposal will not be opened or considered.
- 6.1.3 The submittal of a completed and signed Attachment A - Certified MBE Utilization and Fair Solicitation Affidavit and a completed and signed Attachment B - MBE Participation Schedule indicates the bidder's or offeror's recognition and commitment to attempt to achieve the MBE goal and/or MBE subgoals, if applicable, for the specific project.
- .1 The bidder or offeror recognizes that their efforts made to initiate contact, to solicit, and to include MBE firms in this project will be reviewed carefully and evaluated based upon the actions taken by them prior to and up to 10 days before the bid or proposal

opening. Follow-up actions taken by the bidder or offeror within the 10 days prior to the bid opening will also be considered.

- .2 Based upon this review and evaluation it will be determined, by the MBE liaison, procurement officer, or a designated person, if a good faith effort was made by the apparent low bidder or apparent successful offeror.
- 6.1.4 The bidder or offeror must check one of the three boxes on Attachment A, which relates to the level of MBE participation achieved for the project. The bidder's or offeror's signature indicates that in the event that they did not meet the MBE goal or sub-goals, if applicable, that:
- .1 They are therefore requesting a waiver, and
 - .2 Documentation of their good faith efforts will be provided to the school system staff within 10 days of being notified that they are the apparent low bidder or apparent successful offeror.
- 6.1.5 The bidder or offeror must submit Attachment B (as and when described above), which lists and provides information related to each certified MBE firm that the bidder or offeror will utilize on this project. A completed and accurate Attachment B is required. All of the work specified to be performed by each MBE firm, the contact information, MDOT certification number, minority code, the dollar values, and percentages must be correct.
- 6.1.6 Attachment B should be completed and submitted with all calculations utilizing the base bid or offer only. A revised Attachment B should be submitted by the successful bidder or offeror once a determination is made as to the acceptance and/or rejection of any alternates.
- 6.1.7 If a request for a waiver has been made, the appropriate box on Attachment A has been checked and the attachment signed, then the LEA should obtain and review the apparent low bidder's or successful offeror's supporting documentation of the good faith efforts to justify the granting of the waiver, prior to submitting the contract award for approval to the board of education.
- 6.1.8 The following documentation shall be considered as part of the contract, and shall be furnished by the apparent low bidder or successful offeror to the MBE Liaison or designated person, within ten (10) working days from notification that the firm is the apparent low bidder or successful offeror:
- .1 A completed Attachment D - Minority Business Enterprise Subcontractor Project Participation Statement shall be completed and signed by the prime contractor and each MBE firm listed on Attachment B - MBE Participation Schedule and Attachment C - Outreach Efforts Compliance Statement shall be signed and completed by the bidder or offeror.

- .2 Notification for purposes of this procedure means the earliest of the following methods of communication: orally in person, orally by telephone, orally by a telephone message, a faxed communication, a letter by date received or an electronic communication.
- .3 The ten (10) working days do not include the day the notification is received, weekends or holidays (State or Federal), but the material submitted must be received by the close of business on the tenth day.
- .4 The requirement to submit the above-listed documentation within the time frame specified will be considered by the IAC in its review of the request for contract award for the project. Failure to submit the required documentation within the time frame specified may result in a delay of the approval of the award of the contract, or the materials being returned without the approval of the award of the contract.

6.2 MBE Contract Performance

- 6.2.1 The contractor shall perform the contract in accordance with the representations made in Attachment A - Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit and Attachment B - MBE Participation Schedule, submitted as part of the bid or proposal.
- 6.2.2 Failure to perform the contract as specified and presented in the bid or proposal submission without prior written consent of the owner shall constitute a violation of a material term of the contract.
 - .1 The contractor shall structure his/her operations for the performance of the contract to attempt to achieve the MBE goals as stated in the solicitation document.
 - .2 The contractor agrees to use his/her best efforts to carry out these requirements consistent with the efficient and effective performance of the contract.
 - .3 The contractor must ensure that all certified MBEs shall have the maximum practical opportunity to compete for additional subcontract work under the contract, even after the award of the contract.
 - .4 The contractor shall submit monthly to the MBE Liaison or the school system's designated representative a report listing any unpaid invoices, over 30 days old, received from any certified MBE subcontractor, the amount of each invoice and the reason payment has not been made.
 - .5 The contractor shall include in its agreements with its certified MBE subcontractors, a requirement that those subcontractors

submit monthly to the MBE Liaison or appropriate representative a report that identifies the prime contract and lists all payments received from the contractor in the preceding 30 days, as well as any outstanding invoices, and the amount of those invoices.

- .6 The contractor shall cooperate in any reviews of the contractor's procedures and practices with respect to minority business enterprises, which the MBE Liaison, the Public School Construction Program, and/or the Governor's Office of Minority Affairs may, from time to time, conduct.
- .7 The contractor shall maintain such records as are necessary to confirm compliance with its MBE participation obligations. These records must indicate the identity of certified minority and non-minority subcontractors employed on the contract, the type of work performed by each, and the actual dollar value of work performed. Subcontract agreements documenting the work performed by all MBE participants must be retained by the contractor and furnished to the MBE Liaison and or appropriate representative on request.
- .8 All records concerning MBE participation must be retained by the contractor for a period of five years after final completion of the contract, and will be available for inspection by the MBE Liaison, representatives from the Public School Construction Program and/or other designated official entities.
- .9 At the option of the MBE Liaison or appropriate agency representative, upon completion of the contract and before final payment and/or release of retainage, the contractor shall submit a final report in affidavit form and under penalty of perjury, of all payments made to, or withheld from MBE subcontractors.
- .10 If at any time after submission of a bid or proposal and before execution of a contract, the apparent successful bidder or offeror determines that a certified MBE listed on Attachment B - MBE Participation Schedule has become or will become unavailable, then the apparent successful bidder or offeror shall immediately notify the procurement officer and provide such officer with a reason(s) why the change has occurred. Any desired change in Attachment B - MBE Participation Schedule shall be approved in advance by the procurement officer and shall indicate the contractor's efforts to substitute another certified MBE subcontractor to perform the work. Desired changes occurring after the date of contract execution may occur only upon written approval by the LEA.
- .11 A business that presents itself as a minority business may participate in a project but the contract value may not be counted toward the MBE goal or subgoals, if applicable, until the business is certified by MDOT. If it is not certified at the time of contract

award it may not be counted toward the goal or subgoals, if applicable, at that time. Only the funds paid after MDOT certification can be counted toward meeting the MBE goal or subgoals, if applicable. If a certified MBE fails to meet the standards specified in State Finance and Procurement Article.14-301, Annotated Code of Maryland, the payments made to the MBE can be recorded and counted under a contract entered into when the MBE was eligible and certified. Ineligibility of an MBE to participate in the MBE program may not be the sole cause of the termination of the MBE contractual relationship for the remainder of the term of the contract.

- .12 Contractors are encouraged to seek additional MBE participation in their contracts during the life of the project. Any additional MBE participation from certified MBEs should be reported to the MBE liaison and should be included in subsequent monthly requisitions for payment.
- .13 The contractor shall complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4), specifically page 3 of 16, *Minority Business Enterprise Participation*, with each requisition submitted for payment. This submittal should accurately reflect the payments to be made that month to MBEs, and the cumulative total for the period specified. Any and all MBE firms that are identified on Attachment B – MBE Participation Schedule should be included on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.
- .14 At the completion of the project the contractor shall prepare a written summary of the final certified MBE participation in the contract as compared to the proposed participation at the time of contract award. This should include the name of each certified MBE, the amount that was anticipated to be paid at the time of contract award, the amount actually paid, and an explanation of any differences that have occurred. Special attention should be given to any situations where the final payment to any MBE was below the level of commitment at the time of contract award.

- 6.3 Except as otherwise provided by law, a contractor may not identify a certified minority business enterprise in a bid or proposal and:
- (i) fail to request, receive, or otherwise obtain authorization from the certified minority business enterprise to identify the certified minority business enterprise in its bid or proposal;
 - (ii) fail to notify the certified minority business enterprise before execution of the contract of its inclusion of the bid or proposal;

- (iii) fail to use the certified minority business enterprise in the performance of the contract; or
- (iv) pay the certified minority business enterprise solely for the use of its name in the bid or proposal.

7.0 Addenda and/or Explanation of Bid Documents

- 7.1 All changes to the bid documents will be made through the appropriate addenda. Any and all such interpretations and any supplemental instructions will be available to all project plan holders. Addenda will be issued a minimum of five (5) business days prior to the date fixed for the opening of bids, excluding date of bid opening, unless the addendum issued extends the due date of the bid.
- 7.2 It is the bidders' responsibility to verify receipt of all addenda. Failure of any bidder to receive any addenda or interpretation shall not relieve that bidder from any obligations under this bid and as amended by all addenda. All addenda so issued shall become a part of the award and contract documents.

8.0 Bid Alternates

- 8.1 Bidders shall Include prices for all bid Alternates as herein.
- 8.2 Bidder-originated Alternates or qualifying statements will not be considered. BCPS shall have the right to accept Alternates in any order or combination.
- 8.3 If the Award Bidder receives notice of acceptance of any additional alternates, at his designated address, within one-hundred twenty (120) calendar days after bid opening OR other length of time as stated on bid form, the Contractor shall add the work included under this alternate to the original Contract at the prices written in the original Form of Proposal.

9.0 Method of Bidding and Award of Contract

- 9.1 Method of award will be by LUMP SUM to the responsive and responsible bidder offering the most favorable price for the BASE BID, OR, the most favorable price for the BASE BID with the inclusion of any or all alternates as specified **in any order at the sole discretion of BCPS.** BCPS reserves the right to combine the work on this project with the work on Relay Elementary School if it is in the best interest of BCPS, in the opinion of BCPS.
- 9.2 Base Bid shall include all work required to complete the improvements as shown on the drawings and required by the specifications in a lump sum bid. All work to be included in the base bid shall be as shown on the drawings and as described in the technical specifications.
- 9.3 Bidders shall submit alternate prices to be added to the Base Bid for certain items of work. Work for which alternate prices are proposed shall be in accordance with Contract requirements; and alternate prices and the corresponding work, if accepted by BCPS, shall become part of all work which

would be added, omitted, or changed, if the alternate price was accepted by BCPS.

- 9.4 Time is of the essence. Submission of the bid shall mean that the Bidder can complete all work "as specified" within the specified time frame. While pricing will be given primary consideration in evaluation of all proposals meeting specifications, the successful bidder must be able to document their ability to service an account of this size and, also, be able to guarantee completion of work on time.
- 9.5 BCPS does not guarantee that all or any work will be done and reserves the right to reject all bids and to re-bid this project at its discretion.

10.0 Bid Opening

- 10.1 At the bid opening the bidders' names and their prices will be read and posted.
- 10.2 Complete evaluation of the bids will not take place at the opening and no indication of award will be made at the opening. The recommended award will be available in the Office of Purchasing after the completed evaluation.
- 10.3 Bids will not be available for review by bidders at the bid opening. BCPS reserves the right to review all materials and present a recommendation to the Board of Education prior to bids being available for review. Bid documents will only be available for review after approval of the contract by the Board. Bidders may call the Office of Purchasing to set up a date and time for reviewing bid documents.

11.0 Inquiries During Bidding

- 11.1 No interpretation of the meaning of the plans, specifications, or other contract documents will be made to any bidder orally. To be given consideration, inquiries must be received at least seven (7) business days prior to the date fixed for the opening of bids, so that they may be responded to in a timely fashion.
- 11.2 Any inquiries regarding "BID DOCUMENT" in this bid shall be IN WRITING to: Anita Randall. Inquiries shall be either e-mailed to: arandall@bcps.org and **not called** into the office in the form of a telephone message.
- 11.3 Any inquiries regarding "SPECIFICATIONS" in this bid shall be IN WRITING to: Murphy & Dittenhafer Architects, Lauren Myatt
Email: lm@murphdittarch.com
Bidders **must** carbon copy ("CC:") Anita Randall, Purchasing Agent and Katy Angstadt (kangstadt@bcps.org), BCPS Project Manager on all correspondence.
- 11.4 Any inquiries regarding the "MBE PARTICIPATION" in this bid shall be directed to Melanie Webster at mwebster@bcps.org and/or to FAX: (410) 887-7831. Questions or concerns regarding the MBE requirements of this solicitation must be raised before the opening of bids or receipt of initial proposals.

12.0 **Bid Submission**

- 12.1 Return of bids to: BALTIMORE COUNTY PUBLIC SCHOOLS
OFFICE OF PURCHASING
ARA-209-17 Attn: Anita L. Randall
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204
- 12.1.1 Bids must have the Bid Due Date and Time, bidder's name, package number, and the above address on the OUTSIDE of the return envelope. Plainly print the words "SEALED BID" on the outside of the envelope to avoid premature opening of the bid.
- 12.1.2 All bids must be delivered to the above address by the specified due date and time. Bids returned to any other address will not be considered.
- 12.2 Proposals shall include **all** of the following, as outlined within "SECTION 00400-FORM OF PROPOSAL":
- 12.2.1 Section 00400-1: Cover Page. Complete, sign and return with bid.
- 12.2.2 Section 00400-2: "Base Bid". Complete, sign and return with bid.
- 12.2.3 Section 00400-3: "Alternates". Complete, sign and return with bid.
- 12.2.4 Section 00400-4: "Unit Prices". Complete, sign and return with bid.
- 12.2.5 Section 00400-5: Ancillary Items (Certificates, Bonding, etc.). Submit as required.
- 12.2.6 Section 00400-6: "Warranty To The Lump Sum". Complete, sign and return with bid.
- 12.2.7 Section 00400-7: "Addenda". Bidders are reminded that the "Addenda" page should be completed and returned whether or not an actual addenda page was issued for this bid. Complete, sign and return with bid.
- 12.2.8 Section 00400-8: "Proposal Sheet". Complete, sign and return with bid.
- 12.2.9 Section 00400-9: "State of Maryland Anti-Bribery Affidavit" & "State of Maryland Tax Certification" (on same page). BCPS receives funding from various sources. In order to maintain this funding, BCPS must have the required affidavits on file with each bid. Complete, sign and return with bid.
- 12.2.10 Section 00400-10: "Certification Regarding U.S. Government Debarment, Suspension, Ineligibility, and Voluntary Exclusion". Complete, sign and return with bid.

- 12.2.11 Section 00400-11: "References". Complete, sign and return with bid.
 - 12.2.12 Section 00400-12: "Board of Directors Diversity Affidavit". Complete, sign and return with bid.
 - 12.2.13 Section 00400-13: "Attachment A: CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT" (Page 1). Complete, sign and return with bid.
 - 12.2.14 Section 00400-14: "Attachment A: CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT" (Page 2). Complete, sign and return with bid.
 - 12.2.15 Section 00400-15: "Attachment B: MBE PARTICIPATION SCHEDULE". Complete, sign and return with bid.
 - 12.2.16 Section 00400-16: "No Bid Sheet". This page should only be returned if not participating in the bid.
 - 12.2.17 All other information and/or forms and/or affidavits specified in Specifications Part II, Technical Specifications, and/or Addenda issued.
- 12.3 All proposals shall be "original". No proposal copies or duplication shall be provided to BCPS at time of bid. Submit one complete original proposal only.
 - 12.4 Proposals submitted improperly and/or incomplete may be deemed as non-responsive.
 - 12.5 Proposals received after the published due date/due time will be rejected as non-responsive.

13.0 Bidder Information

- 13.1 Bidders are invited to register on the BCPS "Vendor Self-Service" (VSS). Award Bidder(s) are required to register. Please follow the registration instructions below:
 - 13.1.1 Type the following into your browser:
<http://www.bcps.org/offices/purchasing/>
 - 13.1.2 Click the link: "Visit our Vendor Self Service Center"
 - 13.1.3 Select "Creating A New Account" for detailed instructions. Print these instructions for reference, and then return to the VSS welcome page.
 - 13.1.4 Click onto "Register" from the VSS welcome page and follow the instructions you printed.
 - 13.1.5 Complete the application. Record your UserID and Password for future use.
- 13.2 Bidders are advised that if you do not have access to the website through your home or business, that the BCPS has computers available for your use in our Office of Purchasing located at 6901 Charles Street, Building "E", 1st Floor,

Towson, Maryland 21204. The VSS is accessible to all interested bidders at this location. Assistance is also available for making the proper connections.

- 13.3 Entering your corporate information into the VSS site is the first step in doing business with BCPS. If you have already done business with BCPS in the past, much of your information may already be present. You may only have to confirm or update the existing information.
- 13.4 BCPS has a bidder's Hotline in place that is updated weekly to inform interested parties of bids that have been issued. For information regarding bids, please call 410-887-7819 OR: visit website: <http://www.bcps.org/offices/purchasing/> Click onto "Bid Board"; Click onto "Invitation to Bid".

14.0 Performance Appraisal

- 14.1 This project will be evaluated from award to closeout. The Office of Purchasing will utilize an electronic evaluation system ("Rating Source") OR a hand-written evaluation form to evaluate vendor performance.
- 14.2 Rating Source is a web-based application utilized to evaluate vendor performance while construction projects are underway at predetermined intervals or milestones. Rating Source can be accessed at www.ratingsource.com . Rating Source is a ["360°"] evaluation process, wherein other team members evaluate each team member. Award Bidder and major sub-contractor(s) will be asked to complete and return a Request for Project Information form. BCPS estimates that participation in the survey process may require up to one hour of supervisory-level time per interval, and intervals may occur as frequently as every 60 days. On-line access to completed evaluations is not guaranteed and will be at the discretion of BCPS. Rating Source instructions can be accessed at: www.bcps.org/offices/purchasing .
- 14.3 The BCPS Project Manager will appraise the performance of contractors on projects not evaluated through Rating Source. The appraisal could happen multiple times throughout the project and no less than one time at the conclusion of work on any given project.
- 14.4 The Award Bidder and major sub-contractor(s) will be furnished with written and/or verbal instructions about how to participate in the evaluation process, and will be expected to participate fully in the evaluation process for the duration of the contract period. All performance appraisals/evaluations will become a part of the contract file for this project. Please contact the Office of Purchasing with any further questions.

END OF PART II: SPECIFICATIONS--GENERAL REQUIREMENTS

SECTION 00200 – INSTRUCTION TO BIDDERS

Described below are instructions provided to assist bidders in the responsible preparations of complete bids. However, it is imperative that each bidder becomes familiar with all aspects of the Contract Documents. General instructions for preparing construction bids with Baltimore County Public Schools are contained in Baltimore County Public Schools Parts I and II and in this section.

1.0 TERMINOLOGY

- 1.1 The term “owner”, “BCPS” as used in these specifications shall mean and refer to the Board of Education of Baltimore County.
- 1.2 The term “contractor”, “bidder” or “award bidder” as used in these specifications shall mean and refer to the Bidder Awarded the Contract by the Board of Education of Baltimore County.
- 1.3 The term “sub-contractor” as used in these specifications shall mean and refer to any and all contractor(s) that are in direct contract with the Award Bidder, who is awarded the Contract for the project, by the Board of Education of Baltimore County.

2.0 The following lists the sections of the bid document in order of precedence, first to last:

- 2.1 Technical Specifications – Divisions 00 through 16;
- 2.2 Drawings;
- 2.3 BCPS Part II: Specifications – General Requirements;
- 2.4 BCPS Part I: General Terms and Conditions.

3.0 INTERPRETATION

- 3.1 Should a bidder be in doubt as to the meaning of any notations shown on the drawings or specifications, or should he find any discrepancy or omission, he shall promptly notify the Architect in writing. All bidders will then be notified, in writing, by means of addenda. The Board of Education will not be responsible for any oral, telephonic explanations or interpretations of the Contract Documents.
- 3.2 A bidder shall be presumed to have familiarity with site conditions and to understand the meaning of all notations shown on the drawings or specifications, unless he seeks clarification in the above manner.
- 3.3 All systems in all divisions are to be bid and constructed as wholly closed, connected, and fully working systems. Any doubts by the Contractor as to the intent of the Construction Documents for such total systems must be verified before bidding.
- 3.4 Each and every trade or subcontractor will be deemed to have familiarized himself with all drawings of this Project including, but not limited to, Civil / Site, Architectural, Structural, Mechanical, Electrical and Hazardous Materials Abatement so as to avoid coordination errors, omissions, and misinterpretations. No additional compensation will be authorized for alleged errors, omissions, or misinterpretations as a result of failure to observe this requirement.

- 3.5 Where device or piece of equipment is referred to in the singular number, such references shall be deemed to apply to as many devices as are required to complete the installation.
- 3.6 The contractor shall reply to the owner and/or the Owner's representative by E-mail when communications from the Owner or the Owner's representative is by E-mail.

4.0 BIDDING AND CONTRACT AWARD

- 4.1 See Part I – GENERAL TERMS AND CONDITIONS and Part II – SPECIFICATIONS – GENERAL REQUIREMENTS section of these specifications for the requirements for the submission of a bid, "Form of Proposal" and other ancillary documents required for a bid submission and contract award.

5.0 PROPOSED SUBCONTRACTORS

- 5.1 The Owner will notify the Contractor of the award of the Contract by the Board of Education of Baltimore County. Within TEN (10) business days after that notification and receipt of a contract for execution, the Contractor shall submit to the Owner, the names and qualifications of those Subcontractors and persons or organizations (including manufacturers furnishing materials or equipment fabricated to a special design) who are to provide structural steel, concrete, masonry, hazardous materials abatement, roofing, mechanical, and electrical material and workmanship, for acceptance by the Owner, along with the Contractor's certification that these same Subcontractors, persons, organizations, or manufacturers will be used on the project and will not be changed without permission of the Owner. If the General Contractor proposes to perform this Work with its own forces, it must submit documentation to support that its current personnel has completed work of similar scope and nature on project of like size within the past three years..
- 5.2 Failure by the Contractor to provide any of the information outlined above within TEN (10) business days after notification, that said Contractor has been awarded the Contract by the Board of Education of Baltimore County, shall result in his bid being deemed non-responsive and the security deposited with his bid (Bid Bond) shall be forfeited to the Owner as liquidated damages for such failure.
- 5.3 The above requirements will not supersede the Owner's State MBE documentation submitted by the Bidder at time of bid.

6.0 NOTICE TO PROCEED

- 6.1 The Contractor agrees to commence work at the site within TEN (10) days after the receipt of Notice to Proceed (NTP) from the Owner. The Owner will send such notice within forty-five (45) days after the date of letter notifying recommendation of Contract award and the Contractor's successful compliance with the Contract requirements contained in that letter.
- 6.2 At the discretion of the Owner, the Contractor may be allowed to mobilize prior to the Owner's receipt of the building permit. If allowed, prior mobilization shall not be construed as start of the project and shall be at the risk of the Contractor. Upon receiving a purchase order for the project and a Notice to Proceed (NTP) from BCPS Department of Physical Facilities, the Contractor may proceed with ordering required materials. This prior mobilization shall not be construed as a Notice to Proceed for the project.

7.0 TIME OF COMPLETION

- 7.1 The tentative date for notice to proceed is March 2017. **All work shall be substantially complete by July 20, 2018, which includes final cleaning per section 01740.**

8.0 SUBMITTALS

- 8.1 Submittal submissions must be started within TEN (10) business days after the Notice to Proceed (NTP).
- 8.2 Submission of the schedule of values shall be as described in Paragraph 9.2 of the AIA Document A201- 1997. The schedule of values shall be submitted on the Application for Payment as stated in Section 00510.
- 8.3 Contractor shall submit a signed and sealed letter from the contractor's accounting firm indicating the company's Additional Labor Burden Rate for the construction project along with a breakdown of labor burden costs that are included in the calculation within TEN (10) business days after the receipt of Notice to Proceed (NTP) from the Owner. A similar letter will be required for each of the subcontractors. Change Orders for the project will be processed with the Fringe Benefit Payment labor burden only and no additional mark-up for labor burden until these letters have been submitted and accepted by BCPS. These letters shall clearly identify the type of project for which the labor burden has been calculated (e.g. Non-Scale Labor Burden Rate, Maryland Prevailing Wage Additional Labor Burden Rate, Davis Bacon Additional Labor Burden Rate, etc.).
- 8.4 Material Safety Data Sheets (MSDS) shall have a minimum of four (4) copies submitted with project submittals. MSDS are to be submitted for any item use on the project, even if used only during the construction phase. Distribution of MSDS will be determined at the pre-construction meeting, one of which shall remain on site in the general contractors trailer in a clearly identified binder.

9.0 SCHEDULING

- 9.1 Working in an Airport Zone:
- 9.1.1 The project is within 3.3 miles of Martin State Airport which requires approvals for the use of a crane. Contractor is responsible for obtaining required permits, determinations, and/or variances from the Maryland Aviation Administration and the Federal Aviation Administration in order to use a crane.
- 9.1.2 The contractor is responsible under the requirements of the Maryland Aviation Administration permit to pump all standing water through a filtering device to a clear water outfall within 24 hours following any rainfall even.
- 9.2 Working at a public site:
- 9.2.1 The award bidders must be aware that the construction is going to occur on a public site with some of the playing fields still in use and the award bidders are

responsible for maintaining a safe clean work site in and around the entire work site.

- 9.2.2 The Contractor shall cooperate with BCPS during demolition and installation work to minimize conflicts and facilitate BCPS usage. Keep driveways and entrances serving the premises clear and available to BCPS, BCPS employees and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
- 9.2.3 The normal hours for construction work on this project at Monday through Friday 7:00AM to 11:00PM or in accordance with local noise ordinance. Construction work hours should be coordinated with the BCPS project manager.

9.3 INTERRUPTIONS OF BUILDING SYSTEMS

- 9.3.1 The contractor shall contact "MISS UTILITY" to have any and all utilities marked in the affected areas of the site prior to any excavation to avoid interruptions of utility service to the facility.
- 9.3.2 Interruptions to the domestic water service, fire alarm system, electrical service an/or systems, intercom system, or any other system required to sustain the school's normal program and activities must be scheduled when the school is not occupied by students and staff. Such interruptions shall be scheduled a minimum of seven calendar days in advance of the interruption. All services must be operational when the school is occupied by students and staff. The heating system must be in operation between October 15 and April 15 and the cooling system must be in operation between April 16 and October 14 for occupied areas.
- 9.3.3 Contractor is responsible for assuring the proper operation of all systems in occupied areas during any interruptions.

9.4 CONTRACTOR CONSTRUCTION SCHEDULE

- 9.4.1 The Contractor shall submit a construction schedule within TEN (10) business days of Notice to Proceed. If this schedule is not adhered to the Contractor may be considered in imminent Breach of Contract.
- 9.4.2 BCPS will monitor the progress of the work and will meet and confer with the Contractor to determine whether or not they are on schedule. If BCPS determines that the Contractor is not on or ahead of schedule:
 - 9.4.2.1 The Contractor will be notified that they have fourteen (14) calendar days to expedite their work to get back on schedule.
 - 9.4.2.2 BCPS will not make any further payments until the Contractor is back on schedule.
- 9.4.3 If at the end of fourteen (14) days the Contractor is still not on schedule, they and their bonding company will be notified that they are in imminent Breach of Contract and BCPS will obtain the work on the open market. BCPS will deduct the amount charged by the alternate company from any monies due to or which may become due from the Contractor.

10.0 POLLUTION CONTROLS

- 10.1 The Contractor is responsible for controlling the levels of construction dust, noise, and odors in the building. Dust levels within the building must be maintained at acceptably low levels through a combination of vigilant cleaning methods and preventative engineering controls. Noise levels and odors must be controlled during both school hours and when students remain in the school for after school activities. If a conflict arises regarding acceptable levels of dust, noise, or odors, the BCPS project representative will determine what is acceptable and the control methods that will be employed. Specific pollution control procedures are included in demolition sections of the Specifications, and these procedures are applicable for both demolition and new work.

11.0 CONTRACT TIME

- 11.1 The times in which the Contractor agrees to complete the Work is of the essence to the Contract and failure to complete within the Contract Times specified will entitle the Owner to, and it will, deduct and retain out of monies which may be due the Contractor under the Contract, the sum stated herein before for each calendar day, in excess of the time stated, including Saturdays, Sundays, and legal holidays. The sum shall not be considered as a penalty, but as a sum mutually agreed upon as the ascertained damages suffered by the Owner because of the delay.
- 11.2 Requests for extension of the Contract Times due to strikes, lack of materials, or any condition over which the Contractor has no control, will be reviewed by the Owner after written application is made for a time extension to the Architect. Any requests for an extension of the Contract Times is to be made immediately upon occurrence of conditions which, in the opinion of the Contractor, warrant such an extension with reasons clearly stated and detailed proof given for such delays beyond Contractor's control, these to be made in writing to the Architect. In establishing the time of construction completion, the weather conditions as recorded by the Weather Bureau over the past 5 years will be taken in to consideration and no request for an extension of time due to weather conditions will be considered unless accompanied by Weather Bureau documentary evidence showing, by comparison, that such weather is abnormal to the average of the past 5 years, and the adverse weather directly delayed critical path work.
- 11.3 Approved contract time extension will be acknowledged in change orders and accounted for in reducing liquidated damages. No other overhead and profit charges will be allowed for time extensions.
- 11.4 Should the work be delayed for any reason due to negligence or accidents (including environmental) on the part of the Contractor or his subcontractors, said occurrences will not be considered cause for a Contractor delay claim (directed to the Owner) nor shall it relieve the Contractor of his schedule responsibilities. Contractor acceleration claims to meet said schedules will also not be considered.

12.0 LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE ON TIME

- 12.1 Liquidated Damages for each and every calendar day that the Architect shall clarify that the Contractor is in default in completing the work to be done after the date scheduled in the Contract Documents, the Contractor shall be liable to the Board of Education for an amount of ONE THOUSAND DOLLARS (\$1,000) which sum is hereby agreed upon not as a penalty, but as liquidated damages which the Board of Education will suffer by reason of such default; provided that the Board of Education shall have the right at its discretion to extend the time for the completion of the work beyond the times herein stated. The Board of Education shall be fully authorized and empowered to deduct and retain from Contract funds the amount of any damages, determined as herein before

stipulated, for each calendar day that the Contractor shall be in default in completing the work after the time fixed in the contract, or after any later date to which the time for completion of the project may have been extended, shall in no way operate as a waiver on the part of the Board of Education of any of its rights under the Contract.

- 12.2 The Contractor shall be determined to be in default if the project is not completed within the specified time in the Contractor's Contract.

13.0 PAYMENTS

- 13.1 Payments shall be made in accordance with Article 5 of the Standard Form of Agreement Between Owner and Contractor (AIA Document A101).

- 13.2 Allowances provided for this project are "direct pass through" costs. When applying for payment in a monthly requisition, invoices for the allowance item are to be provided with the requisition without any overhead and profit. At the completion of the project any unused allowance funds will be deducted from the contract amount by a change order to the contract, with a 3% deduction from the allowance balance credit for handling.

14.0 INFORMATION PRICES

- 14.1 Contractor shall provide informational prices for all items listed below within TEN (10) business days of after notice of award and receipt of contract. Prices will be provided to the Interagency Committee on School Construction of the State of Maryland. These prices will not affect the award of the project or the Notice to Proceed (NTP). Information to be provided in a letter to the BCPS Project Manager.

1. TBD

- 14.2 Additional items may be requested after bids are received. The Bidder shall provide prices for these items within TEN (10) working days after receiving request.

15.0 STORAGE

- 15.1 There is insufficient space in the school for the Contractor's storage and office space. The Bidder should include a trailer (or trailers) for office use and storage of all his materials and equipment. The trailer should also be used to store BCPS-owned materials (i.e., ceiling tiles, etc.) to be reinstalled. The size of the trailer (or trailers) is to be determined by the bidder and incorporated into his bid price, accordingly. All security for the trailer(s) is the responsibility of the Contractor. All provisions (i.e., preparation of foundation, delivery of trailer, etc.) for the trailer(s) is the responsibility of the Contractor.

- 15.2 All supplies and/or materials must be held by the Contractor until needed at the site.

- 15.3 Delivery of equipment and other materials on site must be done with the Contractor present and stored on site as indicated by the Office of Engineering and Construction. These shall not be delivered to the site prior to the start of work, unless approved by the Office of Engineering and Construction. All deliveries must be scheduled, received, and will be the responsibility of the Contractor. Deliveries by Drop Shipment from other sources will not be accepted by BCPS. The Contractor shall obtain the permission of the project manager regarding any needed storage of materials and equipment. Such storage shall be done in a manner as not to interfere with the building schedule. The Contractor shall be responsible for any and all accidents caused by negligence from this

source. BCPS does not accept responsibility for losses of material or equipment, regardless of approval to store, in any facilities or grounds.

- 15.4 The Contractor is responsible for the safe, out of weather storage of all materials. Staging area location must be approved by the Owner and secured with a fence by the Contractor.

16.0 SUBSTITUTIONS

- 16.1 Where a specific manufacturer or trade name is designated, it is to establish a standard of material, design function, finish, and quality. Only products of the named acceptable manufacturers and "or equal" (in quality, accessories, and attachments) are to be used in the Contractor's Bid Proposal.

16.1.1 The Contractor shall be responsible for determining what model or product of the acceptable manufacturer meets the specified standards. Other products which will perform equally the duties imposed by the general design will be considered providing submittal for substitutions is in strict accordance with SECTION 01600, "Product Requirements".

17.0 ACCEPTABLE PRODUCTS / MANUFACTURER(S)

- 17.1 Where the specifications list acceptable manufacturers' products or materials, it shall be the responsibility of the Contractor, without cost to the Owner, to make modifications necessary to the drawings and specifications that are required to install the acceptable products.

17.2 Where the name(s) of "Acceptable Manufacturer(s)" are listed in these specifications for a particular product or material and the performance specification of a product or material of one of the "Acceptable Manufacturers" is given, the other "Acceptable Manufacturers" must meet or exceed the performance specifications stated therein. Materials and products of "Acceptable Manufacturers," other than that stated in the performance specifications, must be approved by the Architect for compliance with the requirements and standards of the performance specifications. The decision of the Architect shall be final and shall not be challenged.

17.3 No new, replacement or restoration materials shall contain asbestos or asbestiform minerals in an amount greater than 0.0% as determined by transmission electron microscopy (TEM). If no commercially available material meets this criterion, written authorization for use of the material shall be obtained from the BCPS Project Manager.

17.4 No new, replacement or restoration materials shall contain lead in an amount greater than 0.00 milligrams per liter or 0.00 milligrams per kilogram. If no commercially available material meets either criterion, written authorization for use of the material shall be obtained from the BCPS Project Manager.

17.5 No new, replacement or restoration materials shall contain polychlorinated biphenyls (PCB) in an amount greater than 0.0 ppm. If no commercially available material meets this criterion, written authorization for use of the material shall be obtained from the BCPS Project Manager.

18.0 ITEMS NOT IN THE CONTRACT

18.1 Items specifically noted as "N.I.C." or "Not in Contract" are not required under this Contract but are to be furnished by others. Contractor shall be responsible for installation and connection of utilities for all items to be furnished by the Owner or others unless specifically noted otherwise. Contractor shall give reasonable notice to Owner of desired delivery date of items being furnished by Owner or others.

20.0 AIR AND WATER BALANCING

20.1 Air and water balancing shall be performed by an independent qualified balancing contractor who must be a certified member of the Associated Air Balance Council (AABC) and/or National Environmental Balancing Bureau (NEBB). This Work must be performed as a direct subcontract under the mechanical contractor.

21.0 CONSTRUCTION PHASE MATERIALS TESTING

21.1 The Owner will hire an independent inspection agency for structural steel testing, concrete testing, and soils testing, who shall perform field inspections, tests and prepare reports. Reports shall state whether tested Work complies with or deviates from requirements. The Contractor is responsible for coordination and scheduling of the inspection agencies. Contractor shall be responsible for assuring continuous coordination of work with testing agencies and facilitating performance of their duties at desired time and schedule.

21.2 All other required material inspection and testing agencies identified in the Contract Documents will be hired by the Owner but the Contractor is responsible for coordination and scheduling of the inspection agencies. Such inspection and testing includes, but is not limited to, field inspection, laboratory testing and certification of mortar, masonry, structural steel, structural framing, and cast-in-place concrete. Refer to various sections of these specifications for requirements.

22.0 ELECTRICAL SERVICE UPGRADES

22.1 Once the new school is built, the school will require a temporary electric power source, during any interruption, to maintain the security system, fire alarm system and telephone system. This temporary power system shall be available and maintained by the Contractor on a 24 hour per day basis during the service change over and other interruptions. The Contractor shall include in the Base Bid all costs for the temporary power including any additional wiring panels, outlets, etc. If an on-site generator is used, a person shall also be on site 24 hours per day.

23.0 SEDIMENT CONTROL

23.1 The Contractor shall, during the term of the Contract, take precautions to prevent sediment runoff by planning and executing sediment control measures which shall be established by applicable County and/or State requirements.

24.0 WELDING, CUTTING AND HEATING OPERATIONS

24.1 When performing welding, cutting and heating operations, any contractors on the project are required to comply with the Federal OSHA regulations outlined in 29 CFR 1926. In addition, all guidelines and procedures in NFPA 51B Standard for Fire Prevention during

Welding, Cutting and other Hot Work must be followed to protect BCPS property and personnel.

- 24.2 BCPS may at anytime during the project request the contractor(s) to provide documentation indicating compliance with the stated regulations and standards.

25.0 BUY AMERICAN STEEL ACT

- 25.1 Consistent with the provisions of the Maryland State Finance and Procurement Article of the Annotated Code of Maryland, Sections 17 - 301 through 17 - 306, inclusive, known as the "Buy American Steel Act."
- 25.2 Wherever in these INSTRUCTION TO BIDDERS "steel products," as hereafter defined, are part of the supplies, services, or constructions required by Owner, for the construction, reconstruction, alternation, repair, improvement or maintenance of public works, the parties bidding shall predicate their base offer continental or insular, subject to the jurisdiction of the United States, unless such "steel products" are not produced in the United States in sufficient quantities to meet the requirements of the Contract, in which event the Base Bid is to contain a certification to this effect.
- 25.3 Each bidder shall furthermore attach to his BID FORM the proposed cost of the supplies, services, or construction required by Owner where foreign "steel products" are proposed to be used.
- 25.4 The Owner, in addition to all other reservations set forth in the Bidding Requirements, shall at the time of issuance of the Award and Contract pursuant thereto, determine whether the supplies, services or construction required is to utilize steel products of domestic or foreign origin.
- 25.5 Note further that in the event the Award and Contract pursuant thereto is predicted upon the utilization of domestic "steel products," then, in addition to all other requirements mandated for performance hereafter in these INSTRUCTION TO BIDDERS, and all documents issued in conjunction there with, the person, corporation, partnership, or other business unit or association to whom the Award and Contract pursuant thereto is issued, shall as a further condition precedent to the obtaining of Final Payment from Owner, furnish same with a certificate under oath that all "steel products" supplied, delivered or constructed were of domestic origin.
- 25.6 The "Buy American Steel" Act of Maryland defines "steel products" as any product "rolled, formed, shaped, drawn, extruded, forged, cast, fabricated, or otherwise similarly processed, or processed by a combination of two or more of such operation, from steel made in the United States by the open hearth, basic oxygen, electric furnace, Bessemer, or other steel making process."

26.0 WARRANTY

- 26.1 The Contractor shall unconditionally guarantee the materials and workmanship of all equipment and materials furnished by the Contractor, its subcontractors or suppliers for a period of at least **TWO (2) YEAR** from the date of substantial completion of the project. If the manufacturer warrants equipment for a period longer than two years the Contractor shall pass through the warranty and document the warranty period beyond the two years to BCPS.
- 26.2 All warranty work shall be accomplished to the satisfaction of the owner within **SEVENTY TWO (72) HOURS** of notification of the work to be done.

- 26.3 All new, replaced, or refurbished equipment installed by the Contractor shall be functional at substantial completion.
- 26.4 All Preventative Maintenance and Operational Procedures required for all new, replaced, or refurbished equipment installed by the Contractor shall be performed by the Contractor prior to substantial completion of the project. Preventative Maintenance shall include all equipment manufacturer required PM and include replacement of construction filters, with the type and size(s) as specified by the equipment manufacturer.
- 26.5 Upon substantial completion, BCPS shall perform all Preventative Maintenance on all new, replaced, or refurbished equipment installed under this contract.

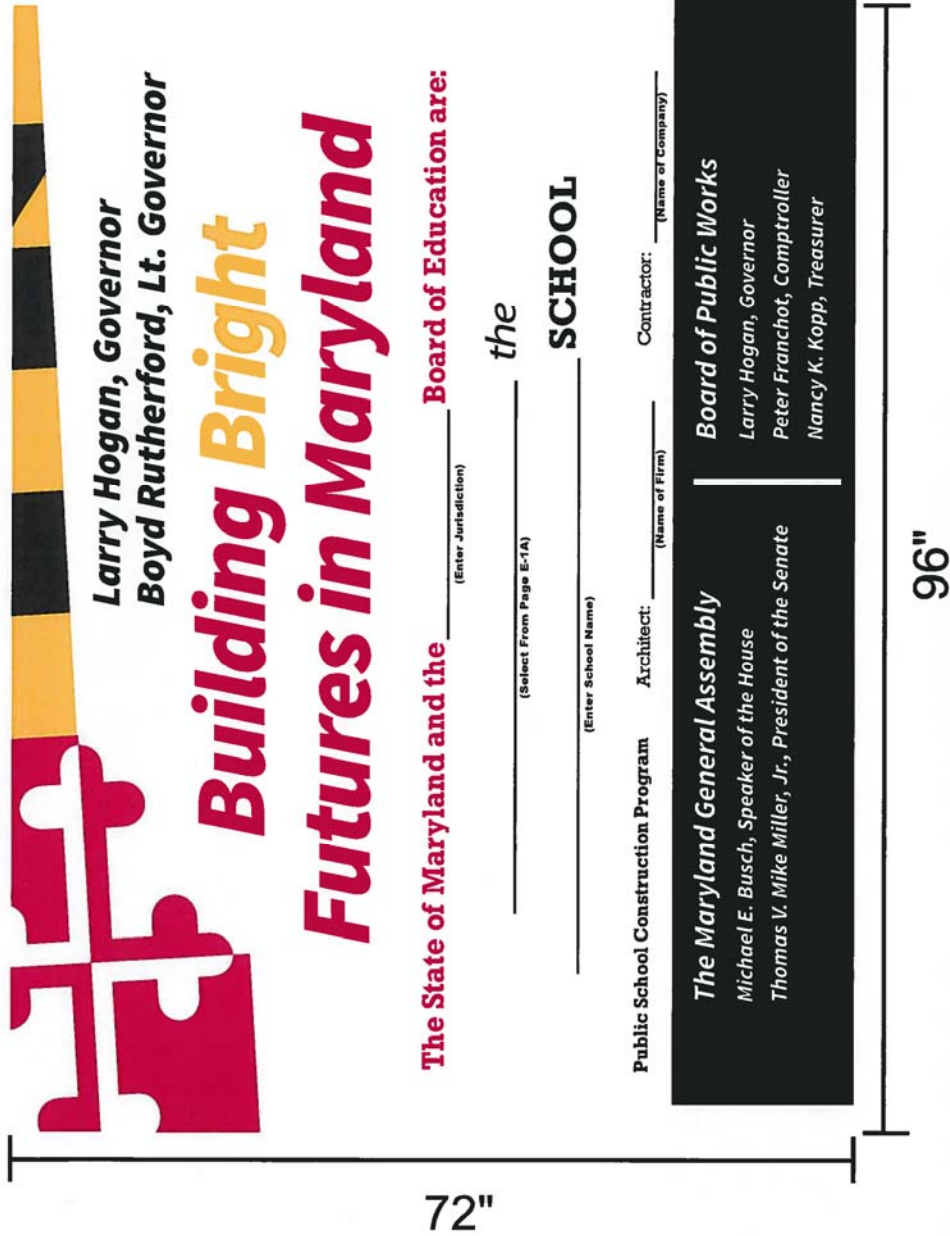
27.0 CONSTRUCTION SIGN

- 27.1 A State school construction sign is required for this project. The Contractor is to purchase and erect the sign in a location designated by BCPS. The sign is to be as shown on the attached sheet and may be purchased from Maryland Correctional Enterprises (MCE).

MCE Sign Plant
C/O Patuxent Institution
Attn: Charles Behnke, Plant Manager
7555 Waterloo Road
Jessup, MD 20794
Phone: 410-799-5102 OR 410-799-5103
Fax: 410-799-7911
Email: cwbehnke@dpscs.state.md.us

- 27.2 There shall be no other signs erected on the site, except as stated below, including contractor and sub-contractor(s) signs. The General Contractor shall be limited to a sign attached to their trailer not to exceed 3 feet by 5 feet and shall include contact information for an emergency. The General Contractor will also be limited to a "ground" sign of 24" X 30" to indicate name and directions for deliveries, with the location to be coordinated with the BCPS Project Manager

APPENDIX E
CONSTRUCTION SIGN FOR STATE FUNDED
SCHOOL CONSTRUCTION PROJECTS



The following appropriate language should be entered on the construction sign to describe the work for the specific project (or modified as required):

- Constructing a Replacement School for Victory Villa Elementary

28.0 SCHOOL CALENDARS

- 28.1 The following days are total system closure without custodial coverage available:
 - a. New Year’s Day
 - b. Martin Luther King, Jr.’s Birthday
 - c. Presidents’ Day
 - d. Good Friday
 - e. Easter Monday
 - f. Memorial Day
 - g. July Fourth
 - h. Labor Day
 - i. Rosh Hashanah
 - j. Yom Kippur
 - k. Thanksgiving
 - l. Christmas Eve
 - m. Christmas Day
 - n. New Year’s Eve
 - o. Election Day(s) – WORK SHALL NOT BE SCHEDULED ON THESE DAYS

- 28.2 The current school calendar for the 2016 – 2017 academic years are found on the following pages. Please note these calendars are subject to change by the Board of Education.

- 28.3 Ending or extension date of the school term may occur depending on the number of emergency closing days required during the school calendar year.

- 28.4 For updated information, please visit: <https://www.bcps.org/calendars>

2016-2017 School Year

Approved: 11/3/15
Revised 06/14/16

August

Friday	12	Administrative & Supervisory Personnel Meeting
Wednesday	17	Teachers on Duty
Thursday	18	Systemwide Professional Development Activities
Wednesday	24	Opening Day for Students

September

Monday	5	Labor Day – Schools and Offices Closed
Monday	12	Systemwide Professional Development Day– Schools Closed for Students – Teachers on Duty; Eid-al-Adha*

October

Monday	3	Schools and Offices Closed – Rosh Hashanah
Monday	10	Columbus Day*
Wednesday	12	Schools and Offices Closed – Yom Kippur
Friday	21	Systemwide Professional Development Day/MSEA Convention – Schools Closed for Students – Teachers on Duty

**Victory Villa Elementary School
Replacement School
PSCP #03.057.17 LP
ARA-209-17**

Friday	28	First Marking Period Ends – Elementary and Middle Schools Close 3 Hours Early for Students – Grade Reporting and Data Analysis** – Teachers on Duty; High Schools in Session Full Day
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November

Tuesday	8	Election Day – Schools and Offices Closed
Thursday	10	Report Cards Distributed; Preschool-3 and Pre-K Conference Day – No Preschool-3 or Pre-K A.M. or P.M. Sessions – Teachers on Duty
Friday	11	Veterans Day*; Elementary Conference Day – Schools Closed for Elementary Students – Teachers on Duty – Middle Schools and High Schools in Session Full Day
Monday-Friday	14-18	American Education Week
Thursday-Friday	24-25	Thanksgiving Holiday – Schools and Offices Closed

December

Friday	9	Half-Day Professional Development – Elementary and Middle Schools Close 3 Hours Early for Students – Teachers on Duty; High Schools in Session Full Day
Thursday	15	Bill of Rights Day*
Thursday	22	Christmas Holiday/Winter Break Begins at the End of School Day

January

Tuesday	3	Schools Reopen
Friday	13	Second Marking Period Ends – All Schools Close 3 Hours Early – Grade Reporting and Data Analysis** – Teachers on Duty
Sunday	15	Dr. Martin Luther King, Jr.'s, Birthday *
Monday	16	Dr. Martin Luther King, Jr.'s, Birthday Observed – Schools and Offices Closed
Tuesday	17	Systemwide Professional Development Day – Full Day Planning and Preparation for Teachers with Semester Courses - Schools Closed for All Students, Teachers on Duty
Thursday	26	Distribution of Report Cards

February

Sunday	12	Lincoln's Birthday*
Friday	17	Half-Day Professional Development – Elementary and Middle Schools Close 3 Hours Early for Students– Teachers on Duty; High Schools in Session Full Day
Monday	20	Presidents' Day – Schools and Offices Closed
Wednesday	22	Washington's Birthday*

March

Saturday	25	Maryland Day*
Friday	31	Third Marking Period Ends – Elementary and Middle School Schools Close 3 Hours Early for Students - Grade Reporting and Data Analysis** – Teachers on Duty; High Schools in Session Full Day

**Victory Villa Elementary School
Replacement School
PSCP #03.057.17 LP
ARA-209-17**

April

Friday	7	Easter Holiday/Spring Break begins at the end of the day##
Tuesday	18	Schools Reopen
Thursday	20	Distribution of Report Cards

May

Monday	8	Pre-K and Kindergarten Conference Day – No Preschool-3, Pre-K, or Kindergarten Sessions; Teachers on Duty
Tuesday	9	Pre-K Conference Day – No Preschool-3 or Pre-K sessions; Teachers on Duty
Friday	26	Last Day for Seniors
Monday	29	Memorial Day Observed – Schools and Offices Closed
Tuesday	30	Commencement Exercises Begin

June

Thursday-Friday	1-9	Commencement Exercises
Wednesday	14	Flag Day*
Thursday	15	Assessment Day*** – Grade Reporting and Data Analysis – Elementary, Middle, and High Schools in Session Full Day – Last Day of Classes for Preschool-3 and Pre-K
Friday	16	Assessment Day*** – Elementary and Middle Schools Close 3 Hours Early for Students – High Schools in Session Full Day - Grade Reporting and Data Analysis** – Teachers on Duty;
Monday	19	Assessment Day*** – Last Day of Classes; Elementary and Middle Schools Close 3 Hours Early for Students – High Schools in Session Full Day – Grade Reporting and Data Analysis** – Teachers on Duty

June

Thursday-Friday	29-30	Summer School Teachers on Duty (Teachers choose June 29 or June 30)
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July

Tuesday	4	Independence Day – Schools and Offices Closed
Wednesday	5	Summer School Begins
Friday	28	Summer School Ends

END OF SECTION 00200

BALTIMORE COUNTY PUBLIC SCHOOLS

DIVISION OF BUSINESS SERVICES
DEPARTMENT OF FISCAL SERVICES
OFFICE OF PURCHASING

6901 CHARLES STREET, BUILDING "E", 1ST FLOOR
TOWSON, MARYLAND 21204
PHONE: (410) 887-4334 FAX: (410) 887-7831

SECTION 00 4000 "FORM OF PROPOSAL"

Bidders shall complete and return all the following forms with their bid.
(*except this form)

Cover Page	00 4000-1
Base Bid	00 4000-2
Alternates	00 4000-3-5
Unit Prices	00 4000-6
Ancillary Items (Certificates, Bonding, etc.)	00 4000-7
Warranty To The Lump Sum	00 4000-8
Addenda	00 4000-9
Proposal Sheet	00 4000-10
State of Maryland Anti-Bribery Affidavit & Tax Certification	00 4000-11
Certification Regarding U.S. Government Debarment	00 4000-12
References	00 4000-13
Board of Directors - Diversity Affidavit	00 4000-14
Attachment A: CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT (Page 1)	00 4000-15
Attachment A: CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT (Page 2)	00 4000-16
Attachment B: MBE PARTICIPATION SCHEDULE	00 4000-17
*No Bid Page	00 4000-18

SECTION 00 4000 - FORM OF PROPOSAL

DATE: _____

PROJECT TITLE: REPLACEMENT SCHOOL FOR VICTORY VILLA ELEMENTARY SCHOOL

BCPS BID NUMBER: ARA-209-17

BID SUBMITTED BY: _____
(Company Name)

PACKAGE NUMBER: _____

REGISTERED MARYLAND CONTRACTOR NO: _____

SUBMITTED TO: Baltimore County Public Schools
Office of Purchasing
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204

The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with the OWNER in the form included in the Contract Documents to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contract Documents.

BIDDER has examined the site and locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations) and the conditions affecting cost, progress, or performance of the Work and has made such independent investigations, as BIDDER deems necessary.

BIDDER hereby agrees to furnish all labor, materials, equipment, and services required to complete the project in strict accordance with the Contract Documents for the following price:

(Signature of Bidder) (Date)

BASE BID

TOTAL BASE BID consisting of the cost of asbestos abatement, demolition, and new construction, including the related architectural, mechanical, electrical, and other requirements incidental to the project.

Bidders shall include the following allowance(s) in their BASE BID:

\$10,000 for removal of unsatisfactory soil and replacement with satisfactory soil material

BASE BID: \$ _____ (IN DOLLARS)

BASE BID: _____ (IN WRITING)

If a BASE BID amount contains contradictory terms, handwritten terms prevail over typewritten terms, and words prevail over numbers. The dollar amount expressed in words shall govern.

(Signature of Bidder) (Date)

ALTERNATES

To be considered for award, bidders shall include a response for ALL ALTERNATES listed below. Failure to provide a response for all Alternates listed in this solicitation shall result in the bidder's entire proposal being deemed non-responsive and ineligible for award. The dollar amount shall be expressed in numbers and words. If an Alternate amount contains contradictory terms, handwritten terms prevail over typewritten terms, and words prevail over numbers. The dollar amount expressed in words shall govern.

The cost of each ALTERNATE shall be valid for the period specified in Part II: Specifications--General Requirements, Section 8.0 Bid Alternates. Any ALTERNATE may be ADDED or DEDUCTED to/from the BASE BID within the award period at the discretion of the Owner. NO COST Alternates, where the bidder agrees to perform the specified Alternate work at no charge to BCPS, shall be recorded by bidder as \$0.00 (zero dollars). Bidders shall be advised that in some instances the proposed Alternate requests a difference in bid price by adding to or deducting from the BASE BID price. Please read alternate descriptions carefully.

The undersigned BIDDER proposes and agrees to ADD or DEDUCT to/from the BASE BID the cost of any of the ALTERNATES.

- 1. **Alternate No. 1 ADD PHOTOVOLTAIC INSTALLATION ON GREEN ROOF:** Furnish and install complete Photovoltaic Installation including steel structure, roof penetrations and fully operational bifacial photovoltaic panel system and all associated electrical work at location where shown on the drawings:

\$ _____ Dollars

_____ (IN WRITING)

- 2. **Alternate No. 2 ADD WEATHER STATION:** Furnish and in install complete fully operational weather station system as specified and provide electrical power and data at location where shown on the drawings.:

\$ _____ Dollars

_____ (IN WRITING)

- 3. **Alternate No. 3 ADD GREEN ROOF:** Furnish and install green roof system over top of the built-up roofing system in lieu of standard roofing system as indicated on the drawings. Provide and install standard hot applied built-up roofing system in lieu hybrid hot applied built-up roofing system.:

\$ _____ Dollars

_____ (IN WRITING)

4. **Alternate No. 4 ADD AWNING VENT WINDOWS:** Furnish and install Awning vent windows in all storefront as indicated on the drawings.

\$ _____ Dollars

_____ (IN WRITING)

5. **Alternate No. 5 ADD EXTERIOR SUN CONTROL DEVICES:** Furnish and install fixed exterior sun control devices where shown in glazed aluminum storefront and curtain wall. Manufacturer shall be the same as the storefront and curtain wall manufacturer.

\$ _____ Dollars

_____ (IN WRITING)

6. **Alternate No. 6 ADD MECHANICAL SCREEN WALL:** Furnish and install "Mechanical Screen Wall" for the rooftop equipment as indicated on the drawings.

\$ _____ Dollars

_____ (IN WRITING)

7. **Alternate No. 7 ADD ENTRANCE CANOPY:** Furnish and install complete entrance canopy including structural system, roofing system, metal fascias and ceilings and lighting fixtures.

\$ _____ Dollars

_____ (IN WRITING)

8. **Alternate No. 8 ADD LED SITE SIGN INSERT:** Furnish and install complete two (2) sided LED sign panels and aluminum enclosure with power and data connections as shown on the drawings.

\$ _____ Dollars

_____ (IN WRITING)

9. **Alternate No. 9 ADD QUARTZ TILE FLOORING:** Furnish and install quartz tile flooring in lieu of VCT at all locations.

\$ _____ Dollars

_____ (IN WRITING)

10. **Alternate No. 10 ADD INSTALL PLAYGROUND EQUIPMENT:** Contractor shall remove existing playground equipment. Contractor shall accomplish all earthwork and grading and shall furnish and install all drainage, concrete mow strips and fence enclosures at Playground. The Owner shall furnish and install the New Playground Equipment.

\$ _____ Dollars

_____ (IN WRITING)

11. **Alternate No. 11 ADD NEW FENCE FABRIC:** Furnish and install new fence fabric for the existing multipurpose court.

\$ _____ Dollars

_____ (IN WRITING)

12. **Alternate No. 12 ADD PLAYGROUND SURFACE:** Furnish and install a complete unitary synthetic poured rubber seamless surface for the kindergarten playground instead of wood fiber mulch. Stabilization and preparation of subgrade shall be included.

\$ _____ Dollars

_____ (IN WRITING)

13. **Alternate No. 13 ADD WOOD VENEER WALL PANELS IN CORRIDORS IN LIEU OF TILE:** Furnish and install wood veneer on corridor walls.

\$ _____ Dollars

_____ (IN WRITING)

14. **Alternate No. 14 ADD TACKABLE SURFACE IN CORRIDORS:** Furnish and install tackable surface in corridors.

\$ _____ Dollars

_____ (IN WRITING)

(Signature of Bidder) (Date)

UNIT PRICES

Unit prices are for both extra Work and credits. This list of prices will be submitted with the Bid in duplicate and shall become a part of the Contract upon its award. Unit prices listed below are applicable to all work in this project involving extra materials/services performed by the General Contractor or his subcontractors and/or credits to the Owner for materials/services deleted from the project. Unit price includes all overhead and profit for the Subcontractor. General Contractor mark-up is to be applied per Article 7 of General Conditions. Prices as stated shall remain in effect through the end of the Contract warranty period. The undersigned acknowledges the unit price values as part of this bid proposal and agrees to add or delete items for the unit prices identified when directed to do so by the Owner.

- 1. **Unit Price No. 1 Unsatisfactory Soil Removal:** Labor, material and equipment for unsatisfactory soil excavation and disposal off site and replacement with satisfactory fill material or engineered fill from off site, as required, according to Section 312000 "Earth Moving." (\$/CY).

\$ _____ Dollars/Cubic Yard

- 2. **Unit Price No. 2 Rock Removal:** Labor, material and equipment for classified rock excavation and disposal off site and replacement with satisfactory fill material or engineered fill from off site, as required, according to Section 312000 "Earth Moving." (\$/CY).

\$ _____ Dollars/Cubic Yard

- 3. **Unit Price No. 3 Heavy-Duty Concrete Paving:** Labor, material and equipment to furnish and install Heavy-Duty Concrete paving according to Section 321313 "Concrete Paving" and Detail 4, Sheet C2.01, complete in place including excavation and stone base (\$/SF).

\$ _____ Dollars/Square Feet

- 4. **Unit Price No. 4 Full-Section Bituminous Paving:** Labor, material and equipment to furnish and install Full-section bituminous paving according to Section 321216 "Hot-mix Asphalt Paving" and Detail 2, Sheet C2.01, complete in place including excavation and stone base (\$/SF).

\$ _____ Dollars/Square Feet

- 5. **Unit Price No. 5 Concrete Sidewalk:** Labor, material and equipment to furnish and install Concrete sidewalk according to Section 321313 "Concrete Paving" and Detail 1, Sheet C2.01, complete in place including excavation and stone base (\$/SF).

\$ _____ Dollars/Square Feet

(Signature of Bidder) (Date)

PROJECT CONSTRUCTION SCHEDULE AND LIQUIDATED DAMAGES

The undersigned agrees to complete Work in strict accordance with the Contract Documents and be substantially complete by not later than the date specified within this solicitation. The Owner may retain the sums as set forth within this solicitation.

MBE SUBMITTALS

The Bidder shall include minority business enterprise material as provided herein **with their proposal**. Bidders failing to submit the minority business enterprise material as provided herein, including the “Attachment A: CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT” and “Attachment B: MBE PARTICIPATION SCHEDULE” may result in the bid being determined non-responsive.

BID BOND

Bidder must include Bid Bond in the form specified within this solicitation.

CERTIFICATE OF PREQUALIFICATION

Bidder must include a copy of the Certificate of Prequalification, as issued by the BCDPW.

ADDENDA

Receipt of Addenda to the Drawings and Specifications shall be acknowledged on the ADDENDA form within this Form of Proposal.

CONTRACT

If the undersigned receives written notice of award of the Contract, at his designated address, within one-hundred twenty (120) calendar days after bid opening (or later if bid has not been withdrawn), the undersigned agrees to execute and deliver a Contract and Bonds in accordance with the bid as accepted, within ten (10) business days from receipt of the Contract, or forfeit the amount of the Bid Bond.

(Signature of Bidder) (Date)

WARRANTY TO THE LUMP SUM

The undersigned affirms that the above Lump Sum Base Bid and Add Alternates represents the entire cost of the Project in accordance with the Bid Documents and that no claim will be made on account of any indexes or any other rate affecting the construction industry and/or this project.

NOTE: Bidder to select one.

If a corporation, give the state of incorporation using the phrase, "A corporation organized under the laws of _____."

If an individual using a trade name, give individual name, using the phrase, "An individual doing business under the firm name of _____."

If a partnership, give name of the partners using also the phrase, "Co-partners trading and doing business under the firm name of _____."

Respectfully submitted,

(COMPANY NAME OF BIDDER)

By _____

(Official title)

(Business Address)

Contractor's Maryland Registration Number

(Phone)

ADDENDA

(If applicable) Please complete and return with your bid response.

I, the undersigned, acknowledge receipt of the following addenda to this solicitation.

Addendum #1 - Date Issued _____

Addendum #2 - Date Issued _____

Addendum #3 - Date Issued _____

Addendum #4 - Date Issued _____

Signature

Title

Contractor Name

PROPOSAL SHEET

- _____ I / We certify that to the best of my/our knowledge, that neither this firm, nor any of its officers, directors to partners nor any of its employees directly involved in obtaining contracts with Federal, State or Local Agencies have been found in violation or attempting to violate procurement articles of the Annotated Code of Maryland (S.F. Section 16.202).

- _____ I / We certify that this bid is made without any previous understanding, agreement, or connection with any person, firm or corporation making a bid for the same supplies, materials, and equipment, and (contracted) services, and is in all respects fair and without collusion or fraud.

- _____ I / We certify that all material and equipment bid by this firm, to be supplied to the Baltimore County Public Schools meets all safety and health standards as prescribed by the rules and regulations of the Maryland Occupational Safety and Health Act (MOSHA). MOSHA STANDARDS 29 CFR 1910.

- _____ I / We certify that all materials delivered to, and/or used or brought on to BCPS property is accompanied by a manufacturer's certification verifying/confirming item(s) to be "asbestos free."

- _____ I / We certify that this firm adheres to or follows non-discriminatory practices with respect to the employment or promotion of personnel without regard to color, creed, race, sex, or national origin.

- _____ I / We propose to furnish, package, mark, and deliver to the Baltimore County Public Schools, the supplies, materials or equipment as required in the accompanying specifications at the unit prices indicated.

- _____ I / We certify that this firm is aware of and adheres to Section 11-722(c) of the Criminal Procedure Article, of the Annotated Code of Maryland

Is your company a certified Minority Business Enterprise with the State of Maryland? ___ Yes ___ No MDOT # _____

Please indicate which group qualifies the business as a Minority Business Enterprise:

(African American) (Alaskan Native) (Asian) (Women) (Hispanic) (American Indian) (Physical or Mental Disabled Individual)

Is your company a small business with less than fifty (50) employees which generates annual revenue less than ten (10) million dollars? ___yes ___No

Is your business located within Baltimore County, Maryland? ___Yes ___No

As the duly authorized representative of the bidder and having the legal authority to make this proposal, I hereby declare that I have carefully examined Terms, Conditions, Requirements, Specifications and Drawings (including all Addenda), forming a part of the Contract and agree to furnish all permits, inspections, labor, equipment, and materials to complete work as specified for the price as indicated for the Baltimore County Public Schools.

COMPANY: _____ FEDERAL ID#- _____

ADDRESS: _____

SIGNATURE: _____

TYPED NAME/TITLE: _____

TELEPHONE: _____ FAX _____ DATE _____

E-MAIL: _____

RETURN BID TO: Office of Purchasing
 6901 Charles Street, Building "E", 1st Floor
 Towson, Maryland 21204
 Include Solicitation Number

STATE OF MARYLAND ANTI-BRIBERY AFFIDAVIT

I HEREBY CERTIFY that

1. I am the _____ and the duly authorized representative of the firm
of _____ who address is _____
_____, and that I possess the legal authority to make this affidavit
on behalf of myself and the firm for which I am acting.
2. Except as described in paragraph 3 below, neither I, nor to the best of my knowledge, the above firm, nor any of its officers, directors, or partners, or any of its employees directly involved in obtaining contracts with the State or any county, bi-county, or multi-county agency, or subdivision of the State have been convicted of, or have pleaded nolo contendere to a charge of, or have during the course of official investigation or other proceeding admitted in writing or under oath acts or omissions committed after July 1, 1997, which constitute bribery, attempted bribery, or conspiracy to bribe under the provisions of Article 27 of the Annotated code of Maryland or under the laws of any state or federal government.
3. (State "none" or, as appropriate, list any conviction, please, or admission described in paragraph 2 above, with the date; court, official, or administrative body; and the sentence or disposition, if any.)

I acknowledge that this affidavit is to be furnished to the requesting agency, to the Secretary of Budget and Fiscal Planning of Maryland, and, where appropriate, to the Board of Public Works and the Attorney General under 16-202, S.F. of the Annotated Code of Maryland. I acknowledge that if the representations set forth in this affidavit are not true and correct, the State may terminate any contract awarded and take any other appropriate action. I further acknowledge that I am executing this affidavit in compliance with 16-203, S.F. of the Annotated Code of Maryland, which provides that certain persons who have been convicted or have admitted to bribery, attempted bribery, or conspiracy to bribe may be disqualified, either by operation of law or after a hearing, from entering into contracts with the State or any of its agencies or subdivisions.

I do solemnly declare and affirm under the penalties of perjury that the contents of this affidavit are true and correct.

Witness

Signature

Date

STATE OF MARYLAND TAX CERTIFICATION

At the time a bid or proposal for a State procurement contract of \$10,000 or more is submitted, the bidder or offeror shall certify to the procurement officer that the bidder or offeror has paid all taxes, unemployment insurance contribution, reimbursement payments, and interest not barred by limitations and payable to the comptroller, the Department of Assessments and Taxation or the Department of Economic and Employment Development or has provided for payment in a manner satisfactory to the unit responsible for collection; and if the bidder or offeror is a vendor of tangible personal property, the bidder or offeror possesses a valid sales and use tax license under Title 11, Subtitle 7 of the Tax - General Article.

I acknowledge that this certificate is to be furnished to the requesting agency, and to the Comptroller of the Treasury, Sales and Use Tax Division under 13-222, S.F. of the Annotated Code of Maryland. I acknowledge that, if the representations set forth in this certificate are not true and correct, the State may terminate any contract awarded and take any other appropriate action.

BIDDERS SHALL PROVIDE STATE OF MARYLAND TAX CERTIFICATION NUMBER ON THE LINE DIRECTLY BELOW:

I do solemnly declare and affirm under the penalties of perjury that the contents of this certificate are true and correct.

Witness

Signature

Date

Name/Title (please type or print)

Name/Title (please type or print)

Date

CERTIFICATION REGARDING U.S. GOVERNMENT DEBARMENT, SUSPENSION, INELIGIBILITY, AND VOLUNTARY EXCLUSION

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR, part 85, Section 85.510, Participants' responsibilities. The regulations were published as Part VII of the May 26, 1988, Federal Register (pages 19160-19211).

(1) The prospective participant certifies, by submission of this proposal, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective participant is unable to certify to any of the statement in this certification, such prospective participant shall attach an explanation to this proposal.

Name and Title of Authorized Agency/Organization Representative

Signature

Date

Agency/Organization

*Above certification instituted by the U.S. Department of Education for all grantees and sub grantees as of fiscal year 1990.

REFERENCES

List at least 3 projects (preferably school systems) -- one may be with BCPS, completed by your organization in the last eighteen (18) months. References--should include projects of similar scope and size for which your firm has provided similar service.

PROJECT #1

Project #1--Brief Description of Type of Project

Organization's name for Public Project #1

Representative's Name (_____)_____
Representative's Phone # (_____)_____
Fax Number

PROJECT #2

Project #2--Brief Description of Type of Project

Organization's name for Public Project #2

Representative's Name (_____)_____
Representative's Phone # (_____)_____
Fax Number

PROJECT #3

Project #3--Brief Description of Type of Project

Organization's name for Public Project #3

Representative's Name (_____)_____
Representative's Phone # (_____)_____
Fax Number

(Signature of Bidder) (Date)

Attachment A (page 1 of 2)

CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT

NOTE: You must include this document with your bid or offer. If you do not submit the form with your bid or offer, the procurement officer shall deem your bid non-responsive or your offer not reasonably susceptible of being selected for award.

* * * * *

Part I.

I acknowledge the:

- Overall certified MBE subcontract participation goal of 30 %; and
The subgoals, if applicable, of:
7 % for certified African American-owned businesses and
4 % for certified Asian American-owned businesses.

I have made a good-faith effort to achieve this goal. If awarded the contract, I will continue to attempt to increase MBE participation during the project.

Part II. Check ONE Box

NOTE: FAILURE TO CHECK ONE OF BOXES 1, 2, or 3 BELOW WILL RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD
NOTE: INCONSISTENCY BETWEEN THE ASSERTIONS ON THIS FORM AND THE INFORMATION PROVIDED ON THE MBE PARTICIPATION SCHEDULE (ATTACHMENT B) MAY RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

- I have met the overall MBE goal and MBE subgoals for this project. I submit with this Affidavit [Attachment A] the MBE Participation Schedule [Attachment B], which details how I will reach that goal.
or
After having made a good-faith effort to achieve the overall MBE goal and MBE subgoals for this project, I can achieve partial success only. I submit with this Affidavit [Attachment A] the MBE Participation Schedule [Attachment B], which details the MBE participation I have achieved.

I request a partial waiver as follows:

- Waiver of overall MBE subcontract participation goal: ___ %
Waiver of MBE subcontract participation subgoals, if applicable:
___ % for certified African American-owned businesses and
___ % for certified Asian American-owned businesses.

Within 10 days of being informed that I am the apparent awardee, I will submit MBE Waiver Documentation [Attachment F] (with supporting documentation).

Attachment A (page 2 of 2)

or

- 3 After having made a good faith effort to achieve the overall MBE goal and MBE subgoals for this project, I am unable to achieve any portion of the goal or subgoals. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B].

I request a full waiver.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

Part III.

I understand that if I am the apparent awardee or conditional awardee, I must submit **within 10 working days** after receiving notice of the potential award or within 10 days after the date of conditional award – whichever is earlier – the:

- *Outreach Efforts Compliance Statement* (Attachment C)
- *Subcontractor Project Participation Statement* (Attachment D)
- *Minority Subcontractors Unavailability Certificate* (Attachment E) (if applicable)
- Any other documentation the Procurement Officer requires to ascertain my responsibility in connection with the MBE participation goal and subgoals

I acknowledge that if I fail to timely return complete documents, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award. If the contract has been awarded, the award is voidable.

I acknowledge that the MBE subcontractors/suppliers listed in the *MBE Participation Schedule* and any additional MBE subcontractor/suppliers identified in the *Subcontractor Project Participation Statement* will be used to accomplish the percentage of MBE participation that I intend to achieve.

In the solicitation of subcontract quotations or offers, MBE subcontractors were provided the same information and amount of time to respond as were non-MBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MBE subcontractors at a competitive disadvantage to non-MBE subcontractors.

I solemnly affirm under the penalties of perjury that this Affidavit is true to the best of my knowledge, information, and belief.

Bidder/Offeror Name

Affiant Signature

Address

Printed Name & Title

Address (continued)

Date

September 2008

**Attachment B
MBE PARTICIPATION SCHEDULE**

This document must be included with the bid or offer. If the bidder or offeror fails to submit this form with the bid or offer as required, the procurement officer shall deem the bid non-responsive or shall determine that the offer is not reasonably susceptible of being selected for award.

1. Prime Contractor's Name	2. Prime Contractor's Address and Telephone Number
3. Project/School Name	4. Project/School Location
5. LEA Baltimore County Public Schools PSC No. 03.159.15 Package # _____	6. Base Bid Amount: \$ _____
7a. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number _____ Minority Firm Fax Number _____ MDOT Certification Number _____	Minority Group Type <input type="checkbox"/> (African American) <input type="checkbox"/> (Women) <input type="checkbox"/> (Asian) <input type="checkbox"/> (Hispanic) <input type="checkbox"/> (American Indian) <input type="checkbox"/> (Disabled)
Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
7b. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number _____ Minority Firm Fax Number _____ MDOT Certification Number _____	Minority Group Type <input type="checkbox"/> (African American) <input type="checkbox"/> (Women) <input type="checkbox"/> (Asian) <input type="checkbox"/> (Hispanic) <input type="checkbox"/> (American Indian) <input type="checkbox"/> (Disabled)
Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
7c. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number _____ Minority Firm Fax Number _____ MDOT Certification Number _____	Minority Group Type <input type="checkbox"/> (African American) <input type="checkbox"/> (Women) <input type="checkbox"/> (Asian) <input type="checkbox"/> (Hispanic) <input type="checkbox"/> (American Indian) <input type="checkbox"/> (Disabled)
Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
8. MBE Total Dollar Amount	9. Total MBE Percent of Entire Contract
10. Form Prepared by: Name: _____ Title: _____ Date: _____	11. Reviewed and Accepted by Board of Education MBE Liaison Name: _____ Title: _____ Date: _____

Total MBE Participation: (See Boxes 8 & 9)	_____ %	\$ _____
Total African-American MBE Participation:	_____ %	\$ _____
Total Asian American-Owned MBE Particip:	_____ %	\$ _____
Total Other Participation:	_____ %	\$ _____

NO BID SHEET (use only when not participating in bid)

PLEASE CHECK THE APPROPRIATE ITEM/S

____ 1. We wish to submit a NO BID at this time. The reason for submitting a NO BID is:

*Failure to complete the above and return this form to the Purchasing Office may result in your removal from the Baltimore County Public School approved vendor list for this bid.

____ 2. Please include our name to RECEIVE FUTURE BIDS for the FOLLOWING GOODS/SERVICES:

____ 3. Please DELETE our name from future bids for this commodity.

____ 4. Please COMPLETE the following:

Is your company a certified Minority Business Enterprise with State of Maryland? ___Yes ___No MDOT#_____

Please indicate which group qualifies the business as a Minority Business Enterprise.

African American Asian Women Hispanic American Indian Physically or Mentally disabled individual

Is your company a small business with less than fifty (50) employees which generates an annual revenue less than ten (10) million dollars? ___Yes ___No

Is your business located within Baltimore County, Maryland? ___Yes ___No

COMPANY	_____
AUTHORIZED SIGNATURE	_____
TYPED NAME/TITLE	_____
ADDRESS	_____
CITY/STATE/ZIP	_____
PHONE	_____ FAX _____

**Return to: Baltimore County Public Schools
Purchasing Agent
6901 Charles Street, Building "E", 1st Floor
Towson, Maryland 21204**

SECTION 00430 - BID BOND

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contractors shall use the attached AIA Document A310 – 2010 format for submission of Bid Bond information.
- B. Submit Bid Bond as part of sealed Bid in accordance with the requirements of Section 00200 - Instructions to Bidders. This Section stipulates Contracts excluded and not excluded from Bid Bond requirements.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00430

 **AIA** Document A310™ – 2010**Bid Bond****CONTRACTOR:***(Name, legal status and address)***SURETY:***(Name, legal status and principal place of business)***OWNER:***(Name, legal status and address)*

Board of Education of Baltimore County
6901 Charles Street
Towson, MD 21204

BOND AMOUNT: \$**PROJECT:***(Name, location or address, and Project number, if any)*

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

Signed and sealed this day of ,

|

(Principal)

(Seal)

(Witness)

(Title)

(Surety)

(Seal)

(Witness)

(Title)

Init.

SECTION 00450 - MINORITY BUSINESS ENTERPRISE PROCEDURES (*State funded version*)

PART 1 - GENERAL

1.1 RELATED PRODUCTS

- A. The Baltimore County Public School System's Minority Business Enterprise Procedures for State Funded Public School Construction Projects is located in **Part II Specifications – General Requirements, Paragraph 6.**
- B. Comply with stipulated procedures and submit required forms as part of each bid.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00450

MINORITY BUSINESS ENTERPRISE PROCEDURES

**MINORITY BUSINESS ENTERPRISE PROCEDURES
FOR
STATE FUNDED
PUBLIC SCHOOL CONSTRUCTION PROJECTS**
Revised JUNE 2008

**Approved by the Baltimore County Board of Education on
October 1, 2008.**

**These procedures supersede the latest procedures which were previously approved
June 1, 2005.**

**DATE OF ORIGINAL APPROVAL: June 10, 1982
DATE OF REVISION: October 1, 2008**

These procedures were approved by the Interagency Committee on School Construction on June 26, 2008 and shall be utilized by each public school system in Maryland as a condition for the receipt of State funds through the Public School Construction Program.

The effective date for implementation for projects in Baltimore County is October 1, 2008.

**MINORITY BUSINESS ENTERPRISE PROCEDURES FOR STATE FUNDED
PUBLIC SCHOOL CONSTRUCTION PROJECTS**

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MINORITY BUSINESS ENTERPRISE PROCEDURES FOR STATE FUNDED PUBLIC SCHOOL CONSTRUCTION PROJECTS

BACKGROUND

In 1978, the Maryland General Assembly passed legislation, which was signed into law to establish the State's Minority Business Enterprise Program. This new law set as a goal that at least 10 percent of each unit of State government's total dollar value of procurement contracts for purchases and/or contracts be awarded to minority business enterprises. This law was subsequently modified and the goal was increased to 14 percent. More recently, in 2001, the goal was increased to 25 percent with subcontracting sub-goals of 7 percent for certified African American-owned businesses and 10 percent for certified women-owned businesses.

In 1979, the Rules, Regulations, and Procedures for the Administration of the School Construction Program were revised by the Board of Public Works to require each local board of education to adopt procedures to attempt to include minority business enterprises in State funded school construction projects. The State law was revised and now states: "The Interagency Committee on School Construction (IAC) shall require each local board of education to adopt procedures consistent with this chapter before obtaining funds for public school construction projects".

In May 2007, the Rules, Regulations, and Procedures were replaced by regulations. The regulations concerning project procurement (COMAR 23.03.03) indicate that the State's minority business enterprise goals and procedures apply to all State funded projects, irrespective of procurement method.

OVERVIEW

This Minority Business Enterprise (MBE) procedure document was originally developed in response to a requirement set forth in the Rules, Regulations, and Procedures for the Administration of the School Construction Program. The MBE requirement was originally established under HB 64, which was passed in the 1978 session of the Maryland General Assembly and signed into law as Chapter 575 of the Acts of 1978.

Since the Board adopted its original Minority Business Enterprise Procedures, there have been changes in State statutes, regulations adopted by the Board of Public Works, procedural requirements, project eligibility requirements and the level of State participation in school construction projects. This revised procedure is consistent with current legislation and the changes to the Code of Maryland Regulations (COMAR) requirements, effective November 7, 2005 and May 21, 2007.

1.0 PURPOSE

The purpose of the Procedures is to fulfill the intent of the law by setting goals for minority business enterprise participation in every contract that includes State funding through the Public School Construction Program. Local Educational Agencies (LEAs) shall attempt to achieve the result that a minimum of 25 percent of the total dollar value of all construction contracts is made directly or indirectly with certified minority business enterprises when State Public School Construction Program (PSCP) funds are utilized, with a minimum of 7 percent from certified African American-owned businesses, a minimum of 4 percent from certified Asian American-owned businesses, and the balance from any certified minority business enterprises. All general contractors, including certified MBE firms, when bidding as general or prime contractors are required to attempt to achieve the MBE subcontracting goals from certified MBE firms.

2.0 EFFECTIVE DATE

These procedures have been adopted for use in Baltimore County and supersede previously utilized MBE procedures, and will take effect on or after October 1, 2008.

3.0 DEFINITIONS

1. **Certification** means the determination that a legal entity is a minority business enterprise consistent with the intent of Subtitle 3 of the State Finance and Procurement Article.
2. **Certified Minority Business Enterprise** means a minority business that holds a certification issued by the Maryland State Department of Transportation (MDOT).
3. **Corporation**, as defined by MDOT, is an artificial person or legal entity created by or under the authority of the laws of any state of the United States, the District of Columbia or a territory or commonwealth of the United States and formed for the purpose of transacting business in the widest sense of that term, including not only trade and commerce, but also manufacturing, mining, banking, insurance, transportation and other forms of commercial or industry activity where the purpose of the organization is profit. For eligibility for certification, disadvantaged and/or minority individuals must own at least 51 percent of the voting stock and at least 51 percent of the aggregate of all classes of stock that have been issued by the corporation. (Note: stock held in trust is not considered as stock held by the disadvantaged businesspersons when computing the business person(s) ownership.)
4. **Managerial Control**, as defined by MDOT, means that a disadvantaged or minority owner(s) has the demonstrable ability to make independent and unilateral business decisions needed to guide the future and destiny of a business.

Control may be demonstrated in many ways. For a minority owner to demonstrate control, the following examples are put forth, but are not intended to be all inclusive:

- a. Articles of Incorporation, Corporate Bylaws, Partnership Agreements and other agreements shall be free of restrictive language which would dilute the minority owner's control thereby preventing the minority owner from making those decisions which affect the destiny of a business;
 - b. The minority owner shall be able to show clearly through production of documents the areas of the disadvantaged business owner's control, such as, but not limited to:
 - 1) Authority to sign payroll checks and letters of credit;
 - 2) Authority to negotiate and sign for insurance and/or bonds;
 - 3) Authority to negotiate for banking services, such as establishing lines of credit; and
 - 4) Authority to negotiate and sign for contracts.
 - c. Agreements for support services that do not lessen the minority owner's control of the company are permitted as long as the disadvantaged or minority business owner's authority to manage the company is not restricted or impaired.
5. **Minority Business Enterprise (MBE)** means any legal entity, except a joint venture, that is (a) organized to engage in commercial transactions, and (b) at least 51 percent owned and controlled by one or more individuals who are socially and economically disadvantaged including:

African Americans;
American Indian/Native Americans;
Asians;

Hispanics;
Physically or mentally disabled individuals;
Women; or
A non-profit entity organized to promote the interests of physically or mentally disabled individuals.

6. **Minority Business Enterprise Liaison** means the employee of the school system designated to administer the Minority Business Enterprise Procedures for State funded public school construction projects.
7. **Operational Control**, as defined by MDOT, means that the disadvantaged or minority owner(s) must possess knowledge necessary to evaluate technical aspects of the business entity. The primary consideration in determining operational control and the extent to which the disadvantaged or minority owner(s) actually operates a business will rest upon the specialties of the industry of which the business is a part. The minority owner should have a working knowledge of the technical requirements needed to operate in his/her industry. Specifically, in the construction industry and especially among small (one to five person firms) contractors, it is reasonable to expect the disadvantaged or minority owner(s) to be knowledgeable of all aspects of the business. Accordingly, in order to clarify the level of operational involvement which a minority owner must have in a business for it to be considered eligible, the following examples are put forth, but are not intended to be all inclusive:
 - a. The minority owner should have experience in the industry for which certification is being sought; and
 - b. The minority owner should demonstrate that basic decisions pertaining to the daily operations of the business are independently made. This does not necessarily preclude the disadvantaged or minority owner(s) from seeking paid or unpaid advice and assistance. It does mean that the minority owner currently must possess the knowledge to weigh all advice given and to make an independent determination.
8. **Ownership**, as defined by MDOT, means that:
 - a. The minority owner(s) of the firm shall not be subject to any formal or informal restrictions, which limit the customary discretion of the owner(s). There shall be no restrictions through, for example, charter requirements, by-law provisions, partnership agreements, franchise or distributor agreements or any other agreements that prevent the minority owner(s), without the cooperation or vote of any non-minority, from making a business decision of the firm.
 - b. This means that the disadvantaged or minority persons, in order to acquire their ownership interests in the firm, have made real and substantial contributions of capital, expertise or other tangible personal assets derived from independently owned holdings without benefit of a transfer of assets, gift or inheritance from non-minority persons. Examples of insufficient contributions include a promise to contribute capital, a note payable to the firm or its owners who are not minority persons or the mere participation as an employee rather than as a manager. If the ownership interest held by a disadvantaged or minority person is subject to formal or informal restrictions, such as options, security interests, agreements, etc., held by a non-minority person or business entity, the options, security interests, agreements, etc., held by the non-minority person or business entity must not significantly impair the disadvantaged or minority person's ownership interest.
9. **Partnership** means an unincorporated association of two or more persons to carry on as co-owners of a business for profit. For a partnership to be deemed eligible for certification under the MDOT Program, the disadvantaged or minority person's interest must be at least 51 percent of the partnership capital.

10. **Socially and Economically Disadvantaged** means a citizen or lawfully admitted permanent resident of the United States who is socially disadvantaged and economically disadvantaged. The law establishes the level of personal net worth at \$1,500,000, above which an individual may not be found to be socially and economically disadvantaged.
11. **Sole Proprietorship**, as defined by MDOT, is a for-profit business owned and operated by a disadvantaged or minority person in his or her individual capacity. For a sole proprietorship to be deemed eligible for certification under the DBE/MBE Program, the disadvantaged or minority person must be the sole proprietor.

4.0 MBE GOAL SETTING PROCEDURES

1. The MBE program requires that all race-neutral measures be considered before making use of race-based measures. Using a combination of race-neutral and race-based measures for each specific school construction project will help ensure that certified MBE firms are afforded the opportunity to submit bids and be utilized to the greatest extent possible.
2. Race-neutral measures include any action taken by the LEA to make it easier for all contractors, including MBEs, to compete successfully for public school construction project contracts.
3. Race-based measures include setting an overall MBE goal and MBE subgoals, if applicable, based upon race, gender, ethnicity, etc., for a specific project.
4. The overall MBE goal and the subgoals, if applicable, should be set for each specific project, considering but not limited to, the following factors:
 - a. The extent to which the work to be performed can reasonably be segmented to allow for MBEs to participate in the project;
 - b. A determination of the number of certified MBEs that potentially could perform the identified work;
 - c. The geographic location of the project in relationship to the identified certified MBEs;
 - d. Information obtained from other State departments/agencies related to establishing a MBE goal and/or subgoals for similar construction projects or work in the jurisdiction;
 - e. Information obtained from other State departments/agencies related to MBE participation in similar construction projects or work in the jurisdiction; and
 - f. Any other activities or information that may be identified as useful and productive.
5. The Superintendent or designee shall establish one or more procurement review groups (PRG). The PRG must include at a minimum the MBE liaison and the Procurement Officer (PO) or a representative from the procurement office. The PRG could also include a capital improvement project manager, the project architect, the cost estimator, the Construction Manager, and/or other individuals selected by the Superintendent or designee.
 - a. The PRG should communicate and/or meet as needed to consider the subcontracting goal and subgoals, if applicable, for individual projects or groups of projects.
 - b. The PRG should consider the factors cited in 4 above when establishing the MBE goal and subgoals, if applicable, for each project or segmented piece of a project that are reasonable and attainable.
 - c. The PRG must complete and submit a written analysis for each state funded school construction project with an estimated cost that is expected to exceed \$200,000.

- i. For state-funded projects that required review of construction documents (CD), the written analysis shall be submitted with the CD documents to the Department of General Services, and will be reviewed by the DGS for submission, appropriate signatures and correspondence between the goal and subgoals, if applicable, indicated in the analysis and those of the procurement documents.
 - ii. For state-funded projects that do not require review of construction documents, the written analysis shall be submitted to the Public Schools Construction Program, and will be reviewed by the PSCP for submission and appropriate signatures.
 - iii. For locally funded projects that are anticipating to be requested for state approval of planning and funding, the written analysis shall be submitted with CD documents to the Maryland State Department of Education, and will be reviewed by MSDE for submission, appropriate signatures, and correspondence between the goal and subgoals, if applicable, indicated in the analysis and those of the procurement documents. Submission of the document is a pre-condition for recommendation for state approval of planning and funding when submitted in an annual CIP.
- d. For projects estimated to cost between \$50,000 and \$200,000 the same analysis form is to be completed and submitted. This could be a responsibility of the PRG, but could be performed by others as well.
- i. For state-funded projects that require review of construction documents (CD), the written analysis shall be submitted with the CD documents to the Department of General Services, and will be reviewed by CGS for submission, appropriate signatures, and correspondence between the goal and subgoals, if applicable, indicated in the analysis and those of the procurement documents.
 - ii. For state-funded projects that do not require review of construction documents, the written analysis shall be submitted to the Public School Construction Program, and will be reviewed by the PSCP for submission and appropriate signatures.
- e. If the project cost is estimated to exceed \$200,000 then a copy of the written analysis shall also be sent to GOMA at the same time that the written analysis is submitted to the DGS or the PSCP.
- f. The PRG should consult with local counsel for the Board of Education as needed.
6. It is recognized that by utilizing the factors cited in 4 above, the MBE goal and/or subgoals, if applicable, for a specific project or portion thereof may be significantly higher than the overall goals of the program (25% overall, with 7% from African American-owned businesses and 4% from Asian American-owned businesses). It is also recognized and possible that there will be MBE goals set that are lower than those stated above or even that no MBE goal and/or subgoals will be set for a specific project or the segmented piece of the project.
7. Assistance in reviewing the factors cited in 4 above and setting a goal and/or subgoals, if applicable, for specific projects or a segmented piece of a project can be obtained by contacting the Public School Construction Program and/or the Governor's Office of Minority Affairs.

5.0 IMPLEMENTING PROCEDURES - \$50,000 OR LESS

For construction projects estimated to cost \$50,000 or less, the following procedures will be utilized

1. A MBE goal and/or MBE subgoals are not required to be set for contracts that are anticipated to be for \$50,000 or less.
2. All advertisements, solicitations, and solicitation documents shall include the following statement:
 - a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation."
3. To encourage greater MBE participation the staff of the school system should send out notices of potential projects and a specific project to MBEs to solicit bids or proposals directly from minority business enterprise contractors that are certified.
4. A copy of the solicitation notice, preferably electronically, shall be sent to the Governor's Office of Minority Affairs at the same time the advertisement for the solicitation is released.
5. When a pre-bid or pre-proposal conference or meeting is held, the MBE liaison or designated representative shall explain that all bidders or offerors are encouraged to utilize certified MBEs for this project or segments of the project.
6. Upon request for a specific project, the school system shall provide one set of drawings and specifications (and addenda when issued) to minority business enterprise associations recognized by the Governor's Office of Minority Affairs. They will be available free of charge to be picked up at a location designated by the LEA. A review of the bid or proposal activity submitted by an association's members may be initiated to justify continuation of this service.
7. Minority Business Enterprise forms identified in Section 6.0 of this procedure for projects over \$50,000, are not required to be submitted for these projects (\$50,000 or less).
8. The names of prime contractors obtaining drawings and specifications will be shared with certified MBEs and MBE associations, upon request.
9. At the time of the contract award, the MBE Liaison or a designated person will record any anticipated certified minority business enterprise participation data made available from the successful contractor.
10. A business that presents itself as a minority business may participate in a project but may not be counted toward MBE participation until it is a certified minority business enterprise. If the MBE is not certified at the time of contract award, it may not be counted at that time. Only the funds paid after MDOT certification can be counted as MBE participation in the project. If a certified MBE fails to meet the standards specified in State Finance and Procurement Article 14-301 (G) and (I), Annotated Code of Maryland, the payments made to the MBE can be recorded and counted under a contract entered into when the MBE was eligible and certified. Ineligibility of an MBE to participate in the MBE program may not be the sole cause of the termination of the MBE contractual relationship for the remainder of the term of the contract.
11. The contractor will complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4), specifically page 3 of 16, Minority Business Enterprise Participation, with each requisition submitted for payment. If certified MBE firms are known at the time of contract award their names and other appropriate information should be entered on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.

12. Upon completion of the project the contractor will provide a summary of the total of all funds paid to certified MBE firms. This should be within the contractor's final requisition for payment.

6.0 IMPLEMENTING PROCEDURES - Over \$50,000

For construction projects estimated to cost in excess of \$50,000, the following procedures will be utilized:

1. All advertisements, solicitations, and solicitation documents shall include the following statements:
 - a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation notice."
 - b. "The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the specific overall MBE goal of __ percent established for this project. All prime contractors, including certified MBE firms, when submitting bids or proposals as general or prime contractors, are required to attempt to achieve this goal from certified MBE firms."

Per COMAR 21.11.03.12-1:

When a certified MBE participates as a prime contractor on a contract, a procurement agency may count the distinct, clearly defined portion of the work of the contract that the certified MBE performs with its own forces toward fulfilling up to 50 percent of the MBE participation goal and up to 100 percent of not more than one of the MBE participation subgoals, if any, established for the contract, provided that the certified MBE prime contractor is:

.1 Identified on the MBE participation schedule pursuant to Regulation .09C(3)(b) of this chapter, including the certification category under which the MBE prime is self-performing and the percentage of the contract value attributed to that work; and

.2 Certified by the certification agency to provide the services, materials, or supplies that it has committed itself to self-perform on the MBE participation schedule.

- c. If subgoals have been established for this project then one of the following should be included:
 - 1) "The subgoals established for this project are __ percent from African American-owned businesses and __ percent from Asian American-owned businesses."
 - 2) "The subgoal established for this project is __ percent from African American-owned businesses."
 - 3) "The subgoal established for this project is __ percent from Asian American-owned businesses."
- d. "The bidder or offeror is required to submit with its bid or proposal a completed Attachment A - Certified MBE Utilization and Fair Solicitation Affidavit and Attachment B - MBE Participation Schedule, as described in the solicitation documents.
- e. If there is no overall MBE goal or MBE subgoals established for the project, then only 1.A. above is to be included.

2. Other Advertisement and Outreach Requirements

- a. To encourage greater MBE participation the staff of the school system should send out notices of potential projects to MBEs or solicit bids or proposals directly from minority business enterprise contractors that are certified.
- b. A copy of the solicitation notice, preferably electronically, shall be sent to the Governor's Office of Minority Affairs at the same time the advertisement for the solicitation is released.
- c. Upon request for a specific project, the school system shall provide one set of drawings and specifications (and addenda when issued) to minority business enterprise associations recognized by the Governor's Office of Minority Affairs. They will be available free of charge to be picked up at a location designated by the LEA. A review of the bid or proposal activity by an association's members may be initiated to justify continuation of this service.
- d. When a pre-bid or pre-proposal conference is held, the MBE Liaison or designated representative shall explain the MBE goal and subgoals, if applicable; the MBE provisions of the solicitation; the documentation required at the time of submission; its relationship to the responsiveness of the bidder or offeror; how to complete the required attachments, particularly A, B, and C; and additional information and supporting documentation that may be required after the bid or proposal opening. All contractors who attend the pre-bid or pre-proposal conference should receive a list or information explaining how to obtain a listing of certified MBE firms who could perform the work or have expressed an interest in performing the school construction work required for the specific project in the jurisdiction.
- e. The names of prime contractors obtaining drawings and specifications will be shared with certified MBEs and MBE associations, upon request.
- f. The MBE liaison, in conjunction with the procurement officer or project staff, should respond to all applicable questions and concerns relating to the project's MBE requirements completely and in a timely fashion to ensure that all potential contractors and subcontractors can compete effectively.

3. All Solicitation Documents Shall Include the Following:

- a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation notice".
- b. "The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the result that a minimum of ___ percent of the total contract value is with certified Minority Business Enterprises, with a minimum of ___ percent from certified African American-owned businesses, a minimum of ___ percent from certified Asian American-owned businesses, and the balance from any certified Minority Business Enterprises. All contractors, including certified MBE firms, when submitting bids or proposals as prime contractors, are required to attempt to achieve the MBE goal and subgoals, if applicable, from certified MBEs".
Note: see 6.1.C. above for variations that may be required.
- c. Each bid or offer submitted, including a submittal from a certified MBE in response to this solicitation, shall be accompanied by a completed Attachment A - Certified MBE Utilization and Fair Solicitation Affidavit and a completed Attachment B - MBE Participation Schedule. These two attachments must be accurate and consistent with each other.
 - 1) Attachment A and Attachment B shall be submitted with the sealed bid price or proposal at a place, date, and time specified in the solicitation document.

- 2) As an alternative, and at the discretion of the school system, Attachment A could be submitted with the sealed bid price or proposal at a place, date, and time specified in the solicitation document. The sealed bids or proposals received by the time specified could be held, unopened for a maximum of 30 minutes. Within that time (30 minutes) each bidder or offeror must submit Attachment B, in a separate sealed envelope. The sealed price envelopes from each bidder or offeror who submits both the sealed bid or proposal and the envelope with Attachment B will then be opened and reviewed and recorded as a viable submission. Any contractor that fails to submit the second envelope, with Attachment B, prior to the specified time allowed (30 minutes) after the submittal of the sealed bid or proposal will be deemed non-responsive and the sealed bid or proposal will not be opened or considered.
- d. The submittal of a completed and signed Attachment A - Certified MBE Utilization and Fair Solicitation Affidavit and a completed and signed Attachment B - MBE Participation Schedule indicates the bidder's or offeror's recognition and commitment to attempt to achieve the MBE goal and/or MBE subgoals, if applicable, for the specific project.
 - 1) The bidder or offeror recognizes that their efforts made to initiate contact, to solicit, and to include MBE firms in this project will be reviewed carefully and evaluated based upon the actions taken by them prior to and up to 10 days before the bid or proposal opening. Follow-up actions taken by the bidder or offeror within the 10 days prior to the bid opening will also be considered.
 - 2) Based upon this review and evaluation it will be determined, by the MBE liaison, procurement officer, or a designated person, if a good faith effort was made by the apparent low bidder or apparent successful offeror.
 - e. The bidder or offeror must check one of the three boxes on Attachment A, which relates to the level of MBE participation achieved for the project. The bidder's or offeror's signature indicates that in the event that they did not meet the MBE goal or subgoals, if applicable, that:
 - 1) They are therefore requesting a waiver, and
 - 2) Documentation of their good faith efforts will be provided to the school system staff within 10 days of being notified that they are the apparent low bidder or apparent successful offeror.
 - f. The bidder or offeror must submit Attachment B (as and when described above), which lists and provides information related to each certified MBE firm that the bidder or offeror will utilize on this project. A completed and accurate Attachment B is required. All of the work specified to be performed by each MBE firm, the contact information, MDOT certification number, minority code, the dollar values, and percentages must be correct.
 - g. Attachment B should be completed and submitted with all calculations utilizing the base bid or offer only. A revised Attachment B should be submitted by the successful bidder or offeror once a determination is made as to the acceptance and/or rejection of any alternates.
 - h. If a request for a waiver has been made, the appropriate box on Attachment A has been checked and the attachment signed, then the LEA should obtain and review the apparent low bidder's or successful offeror's supporting documentation of the good faith efforts to justify the granting of the waiver, prior to submitting the contract award for approval to the board of education.
 - i. The following documentation shall be considered as part of the contract, and shall be furnished by the apparent low bidder or successful offeror to the MBE Liaison or designated person, within ten (10) working days from notification that the firm is the apparent low bidder or successful offeror:

- 1) A completed Attachment D - Minority Business Enterprise Subcontractor Project Participation Statement shall be completed and signed by the prime contractor and each MBE firm listed on Attachment B - MBE Participation Schedule and Attachment C - Outreach Efforts Compliance Statement shall be signed and completed by the bidder or offeror.
- 2) Notification for purposes of this procedure means the earliest of the following methods of communication: orally in person, orally by telephone, orally by a telephone message, a faxed communication, a letter by date received or an electronic communication.
- 3) The ten (10) working days do not include the day the notification is received, weekends or holidays (State or Federal), but the material submitted must be received by the close of business on the tenth day.
- 4) The requirement to submit the above-listed documentation within the time frame specified will be considered by the IAC in its review of the request for contract award for the project. Failure to submit the required documentation within the time frame specified may result in a delay of the approval of the award of the contract, or the materials being returned without the approval of the award of the contract.

4. Waiver Procedures

- a. If the apparent low bidder or successful offeror has determined that they are unable to meet the overall MBE goal or subgoals, if applicable, for the project at the time of submission of a bid or offer, they must check either of the two boxes on Attachment A. The signature recognizes and acknowledges that a request for a waiver is being made. The apparent low bidder or successful offeror will therefore be required to submit information and substantiating documentation that will be reviewed to justify the granting of a waiver.
- b. If the apparent low bidder or successful offeror is unable to achieve the overall MBE contract goal and/or the MBE subgoals, if applicable, from certified African American-owned businesses and/or from certified Asian American-owned businesses, the apparent low bidder or successful offeror shall submit, within 10 working days from notification that the firm is the apparent low bidder or successful offeror, a completed Attachment C - Outreach Efforts Compliance Statement, Attachment E - Minority Subcontractors Unavailability Certificate, and Attachment F - MBE Waiver Documentation which shall include the following:
 - 1) A detailed statement of the efforts made by the bidder or offeror to identify and select portions of the work proposed to be performed by subcontractors in order to increase the likelihood of achieving the stated goal;
 - 2) A detailed statement of the efforts made by the bidder or offeror prior to and up to at least ten (10) days before the bid or proposal opening to solicit minority business enterprises through written notices that describe the categories of work for which subcontracting is being solicited, the type of work to be performed and specific instructions on how to submit a bid or proposal;
 - 3) Follow-up actions taken by the bidder or offeror within the 10 days prior to the bid or proposal opening will also be considered.
 - 4) A detailed statement of the bidder's or offeror's efforts to make personal contact with MBE firms identified for item (2) above;
 - 5) A record of the name, address, telephone number and dates contacted for each MBE identified under items (2) and (3) above;
 - 6) A description of the information provided to MBEs regarding the drawings, specifications and the anticipated time schedule for portions of the work to be performed;
 - 7) Information on activities to assist minority business enterprises to fulfill bonding requirements or to obtain a waiver of these requirements;
 - 8) Information on activities to publicize contracting opportunities to minority business enterprises, attendance at pre-bid or pre-proposal meetings or other meetings scheduled by the MBE Liaison or designated representative; and

- 9) As to each MBE that placed a subcontract quotation or offer which the apparent low bidder or successful offeror considers not to be acceptable, a detailed statement of reasons for this conclusion.
- c. In addition to any waiver documentation the apparent low bidder or successful offeror shall submit one completed Attachment D - Minority Business Enterprise Subcontractor Project Participation statement for each MBE firm that will participate in the project consistent with the information previously provided at the time of the submission of Attachment B or the revised Attachment B.
 - d. A waiver of an MBE contract goal or subgoal, if applicable, may be granted by the school system only upon receipt of Attachment C - Outreach Efforts Compliance Statement, Attachment E - Minority Subcontractors Unavailability Certificate, and Attachment F - MBE Waiver Documentation as described above in items 1) through 9)
 - 1) The MBE Liaison will review and accept or reject the minority business enterprise material that is submitted, and could obtain legal advice or assistance from their attorney.
 - 2) The MBE waiver request may not be considered unless all of the documentation specified above has been submitted in a timely fashion by the apparent low bidder or successful offeror.
 - 3) Assistance in the review of a request for a waiver (the documentation and justifications) may be requested from the Public School Construction Program and/or the Governor's Office of Minority Affairs.
 - 4) If a determination is made that the apparent low bidder or successful offeror did make a good faith effort, based upon a review of the documentation submitted, then the waiver must be granted. The award of contract shall then be made. The material and information submitted, including the LEA's review and analysis notes and conclusion shall be retained in the project file.
 - 5) If a determination is made that the apparent low bidder or successful offeror did not make a good faith effort, based upon a review of the documentation submitted, then the waiver should not be granted. The material and information submitted, including the LEA's review and analysis notes and conclusion, shall be retained in the project file. The award of contract shall then be made to the next lowest bidder or offeror, who meets the contractual requirements, including the MBE requirements.
 - 6) When a waiver is granted, a copy of Attachment F - MBE Waiver Documentation, accepted and signed by a school system representative and with the reasons for the determination, shall be forwarded to the Governor's Office of Minority Affairs and the Public School Construction Program within ten (10) days after approval of the contract award by the board of education. Failure to submit the required documentation within the time frame specified may result in delayed approval of the award of contract by the IAC.
5. All Contracts Shall Include The Following:
 - a. "The contractor shall perform the contract in accordance with the representations made in Attachment A - Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit and a completed Attachment B - MBE Participation Schedule, submitted as part of the bid or proposal".
 - b. "Failure to perform the contract as specified and presented in the bid or proposal submission without prior written consent of the owner shall constitute a violation of a material term of the contract".
 - 1) The contractor shall structure his/her operations for the performance of the contract to attempt to achieve the MBE goals as stated in the solicitation document.
 - 2) The contractor agrees to use his/her best efforts to carry out these requirements consistent with the efficient and effective performance of the contract.

- 3) The contractor must ensure that all certified MBEs shall have the maximum practical opportunity to compete for additional subcontract work under the contract, even after the award of the contract.
- 4) The contractor shall submit monthly to the MBE Liaison or the school system's designated representative a report listing any unpaid invoices, over 30 days old, received from any certified MBE subcontractor, the amount of each invoice and the reason payment has not been made.
- 5) The contractor shall included in its agreements with its certified MBE subcontractors, a requirement that those subcontractors submit monthly to the MBE Liaison or appropriate representative a report that identifies the prime contract and lists all payments received from the contractor in the preceding 30 days, as well as any outstanding invoices, and the amount of those invoices.
- 6) The contractor shall cooperate in any reviews of the contractor's procedures and practices with respect to minority business enterprises, which the MBE Liaison, the Public School Construction Program, and/or the Governor's Office of Minority Affairs may, from time to time, conduct.
- 7) The contractor shall maintain such records as are necessary to confirm compliance with its MBE participation obligations. These records must indicate the identity of certified minority and non-minority subcontractors employed on the contract, the type of work performed by each, and the actual dollar value of work performed. Subcontract agreements documenting the work performed by all MBE participants must be retained by the contractor and furnished to the MBE Liaison and or appropriate representative on request.
- 8) All records concerning MBE participation must be retained by the contractor for a period of five years after final completion of the contract, and will be available for inspection by the MBE Liaison, representatives from the Public School Construction Program and/or other designated official entities.
- 9) At the option of the MBE Liaison or appropriate agency representative, upon completion of the contract and before final payment and/or release of retainage, the contractor shall submit a final report in affidavit form and under penalty of perjury, of all payments made to, or withheld from MBE subcontractors.
- 10) If at any time after submission of a bid or proposal and before execution of a contract, the apparent successful bidder or offeror determines that a certified MBE listed on Attachment B - MBE Participation Schedule has become or will become unavailable, then the apparent successful bidder or offeror shall immediately notify the procurement officer and provide such officer with a reason(s) why the change has occurred. Any desired change in Attachment B - MBE Participation Schedule shall be approved in advance by the procurement officer and shall indicate the contractor's efforts to substitute another certified MBE subcontractor to perform the work. Desired changes occurring after the date of contract execution may occur only upon written approval by the LEA.
- 11) A business that presents itself as a minority business may participate in a project but the contract value may not be counted toward the MBE goal or subgoals, if applicable, until the business is certified by MDOT. If it is not certified at the time of contract award it may not be counted toward the goal or subgoals, if applicable, at that time. Only the funds paid after MDOT certification can be counted toward meeting the MBE goal or subgoals, if applicable. If a certified MBE fails to meet the standards specified in State Finance and Procurement Article.14-301, Annotated Code of Maryland, the payments made to the MBE can be recorded and counted under a contract entered into when the MBE was eligible and certified. Ineligibility of an MBE to participate in the MBE program may not be the sole cause of the termination of the MBE contractual relationship for the remainder of the term of the contract.
- 12) Contractors are encouraged to seek additional MBE participation in their contracts during the life of the project. Any additional MBE participation from certified MBEs should be reported to the MBE liaison and should be included in subsequent monthly requisitions for payment.

- 13) The contractor shall complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4), specifically page 3 of 16, *Minority Business Enterprise Participation*, with each requisition submitted for payment. This submittal should accurately reflect the payments to be made that month to MBEs, and the cumulative total for the period specified. Any and all MBE firms that are identified on Attachment B - MBE Participation Schedule should be included on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.
- 14) At the completion of the project the contractor shall prepare a written summary of the final certified MBE participation in the contract as compared to the proposed participation at the time of contract award. This should include the name of each certified MBE, the amount that was anticipated to be paid at the time of contract award, the amount actually paid, and an explanation of any differences that have occurred. Special attention should be given to any situations where the final payments to any MBE was below the level of commitment at the time of contract award.

6. Projects Utilizing a Construction Manager Delivery Method

This section of the procedure has been prepared based upon the utilization of Construction Manager Agency method of delivery. If another alternative method of project delivery is being considered, then these procedures would need to be adapted in consultation with the PSCP before proceeding.

- a. For projects that are being designed and solicited utilizing a Construction Manager Agency delivery method with multiple prime contracts, the school system can structure its procedures to attain the overall MBE goal and subgoals, if applicable, for the project as presented below:
- b. The MBE liaison and other school system staff should work with the project's construction manager, cost estimator, and architect, along with any other individuals who could provide assistance, to determine the overall MBE utilization strategy for the work required, appropriate bid packages, and an appropriate overall MBE goal and subgoals, if applicable, for each specific bid or proposal package.
- c. ~~The overall MBE goal and subgoals, if applicable, for the project shall represent the~~ aggregate of the individual goals and subgoals, if applicable, set for each bid or proposal package.
- d. In setting the specific goals and subgoals, if applicable, for each solicitation package consideration should be given to the potential for MBE participation to the maximum extent possible. The information and procedures provided in section 4.0 MBE Goal Setting Procedures should be consulted and followed for these types of projects.
- e. Prior to submitting the construction documents for State review and authorization to solicit bids or proposals, the school system's representative will prepare a complete list of the individual solicitation packages and indicate the MBE goal and subgoals, if applicable, for each solicitation package. This would include the overall MBE goal and subgoals, if applicable, established in the solicitation documents, the estimated cost for each solicitation package, and the estimated MBE dollar amounts for each solicitation package. A copy of this list should be submitted with the construction documents. The list should be retained as a record by the school system for comparison to the actual contracts awarded with MBE participation, and the final actual MBE participation at the completion of the project.
- f. Contractors submitting bids or proposals for solicitation packages that do not include a MBE goal and subgoals, if applicable, would not be required to submit any of the MBE attachments that are otherwise required nor would they be required to indicate that they are requesting a waiver. The school system representative would, however, request information from the contractor at the completion of the project to determine if any certified MBE firms had participated in the contract.

- g. All other submittals of MBE materials and reporting requirements are applicable for the project, including the submittal of attachments a and b as described above in section 6.0. this includes the documentation for a request for a waiver, if applicable and appropriate.
7. Projects Utilizing an Indefinite Delivery/Indefinite Quantity (IDIQ) or Job Order Contracting (JOC) Method of Delivery
- a. The solicitation should be prepared and the overall MBE goal and subgoals, if applicable, established based upon the type of work that is anticipated to be specified or performed under the contract and the availability of certified MBEs. This could include an analysis of the percentages of the different types of work, the estimated dollar value in the entire contract, and the availability of MBEs.
 - b. If an overall goal and subgoals, if applicable, are set the bidders or offerors would be required to submit Attachment A - Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit in which they could indicate their anticipated MBE participation based upon the entire contract amount and the types of work specified. The award of contract can be made based upon their estimate of MBE participation since there is no specific task order or description of work to be performed and subcontractors have not been identified or engaged through any type of commitment or subcontract.
 - c. Since MBE participation is only anticipated in a general sense as an objective and specific contracts to MBEs have not been signed, then the contract award would not be included in any reporting to the PSCP or subsequent reporting to GOMA.
 - d. However, as the contract proceeds and individual task orders and/or purchase orders are issued, the contractor should submit Attachment B - MBE Participation Schedule for any and all projects or work where MBE subcontractors and/or suppliers might reasonably be utilized. Discussions between the contractor or offeror and the LEA as the task orders and/or purchase orders are being developed should address this aspect of the contract requirements.
 - e. Any MBE participation should be recorded by the MBE liaison and reported to the PSCP MBE Liaison as the task orders and/or purchase orders are approved.
 - f. The contractor shall complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP FORM 306.4), specifically page 3 of 16, *Minority Business Enterprise Participation*, with each requisition submitted for payment. This submittal should accurately reflect the payments to be made that month to MBE S, and the cumulative total for the period specified. Any and all MBE firms that are identified on Attachment B - MBE Participation Schedule should be included on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.
 - g. At the completion of the contract period or the full utilization of the contract's value a report should be prepared by the LEA MBE Liaison and submitted to the PSCP MBE Liaison summarizing the MBE participation in each and all of the task orders or purchase orders issued under the contract. This should include the anticipated MBE participation prior to the issuance of the solicitation, the MBE participation anticipated at the time of contract award and the actual MBE participation at the completion of the contract.
8. Projects Utilizing the Design/Build Delivery Method
- a. The solicitation is for both A/E services and the actual construction of a public school project. The solicitation should be prepared and the MBE goal and subgoals, if applicable, established for the construction work that is anticipated for the project. The goal setting procedures described in Section 4.0 above should be utilized for these types of projects.

- b. The bidders or offerors should be required to submit Attachment A - Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit on which they would indicate their anticipated MBE participation based upon the construction work anticipated and their understanding of the MBE goal and subgoals, if applicable, the types of work involved, and the availability of certified MBEs for the project. Since there are no detailed plans or designs for the project and there are no contracts or subcontracts for the actual construction work there is no need to submit any other MBE attachments, at this time.
- c. If the bidder or offeror, who is to be awarded this contract has indicated that they do not anticipate achieving the overall MBE participation goal and subgoals, if applicable, for this project on Attachment A, then they are in effect requesting a waiver. They will be required to submit documentation at a later date to justify this request.
- d. As the project proceeds through the design phase and the project is nearing the completion of the construction documents for submission to the State to review, the Design/Build Team (team) in consultation with LEA representatives should discuss the opportunities and potential for certified MBEs to participate in the project.
- e. The team should begin to identify potential contractors and subcontractors, opportunities to segment the project, and MBEs that could participate in the project.
- f. At a point in time that is approximately 30 days prior to the anticipated CD submission to the State, the team should complete and submit Attachment B - MBE Participation Schedule to the LEA for their review and approval.
- g. If the team had indicated on Attachment A that they would meet the goals and the information on Attachment B indicates that they did meet the goals then the team should proceed with the construction of the project.
- h. If the team had indicated on Attachment A that they did not anticipate meeting the overall MBE goal and subgoals, if applicable, or only a portion of the goal and subgoals, if applicable, then Attachment B should be reviewed by the LEA. The team should, at this time, submit their documentation in support of the waiver requested.
- i. The proposed MBE participation should be reviewed and a determination made as to whether the team has made a good faith effort to meet the MBE goals and subgoals, if applicable, established for the project and as stated on Attachment A, previously submitted.
- j. If a request for a waiver is made and approved, Attachment F - MBE Waiver Documentation should be signed by a school system representative and submitted to the PSCP and the Governor's Office of Minority Affairs.
- k. Since there was no MBE participation reported at the time of the award of the Design/Build contract, the LEA would submit the entire package of information, including all of the MBE related attachments to the PSCP within ten (10) days of the team being directed to proceed with the actual construction work.
- l. All other submittals of MBE materials and reporting requirements are applicable for the project, as described above in Section 6.0.

7.0

RECORDS AND REPORTS

1. The MBE Liaison shall maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures and activities. The records shall be maintained until the project is audited by the Public School Construction Program. These records shall include by project:
 - a. The contractor report submitted at the completion of the project;
 - b. The identity of the minority contractors employed on the project;
 - c. The type of work performed;
 - d. The actual dollar value of the work, services, supplies or equipment; and
 - e. The MBE percentage of the total contract.
2. The MBE Liaison will maintain a record of all waivers approved for each project or solicitation package where the prime contractor was unable to achieve the established overall goal or subgoals, if applicable. The MBE Liaison will, however, report to the PSCP all MBE participation by MDOT certified firms who are prime contractors, subcontractors, suppliers, or otherwise making an economically viable contribution to each project. This information shall be reported to PSCP within ten (10) days after approval of the award of the contract by the board of education.
3. The LEA shall submit the “Certified Minority Business Enterprise Participation Standard Monthly Contractor’s Requisition for Payment” (IAC/PSCP Form 306.4 page 3 of 16, located in the Administrative Procedures Guide), which is Attachment G in this procedure, to the PSCP Director of Fiscal Services as part of the regular monthly request for payment for the project.
4. The LEA shall submit the “Close-Out Cost Summary” (IAC/PSCP Form 306.6 located in the Administrative Procedures Guide), which is Attachment H of this procedure, along with the “Certified Minority Business Enterprise Participation Standard Monthly Contractor’s Requisition for Payment” (IAC/PSCP Form 306.4) to the PSCP Director of Fiscal Services within 180 days of completion of the project.
5. Each fiscal year end, PSCP Fiscal Services will create a report “Payments Made To Contractors during The Fiscal Year” and maintain such records as are necessary to confirm compliance with its minority business enterprise procedures and activities.
6. Each fiscal year end, PSCP Fiscal Services will create a report “Projects Completed During the Fiscal Year” and maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures and activities. This report will compare the overall MBE goal and subgoals, if applicable, for each specific project with the MBE participation anticipated at the time of contract award and the actual MBE participation at the completion of the project.

8.0

MONITORING

1. The LEA’s procurement personnel or project staff shall verify that the certified MBE’s listed in the MBE participation schedule are actually performing the work.
2. The LEA’s procurement personnel shall ensure that MBE subcontractors are receiving compensation as set forth in the MBE participation schedule by ensuring that the contractor submits monthly reports, listing any unpaid invoices over 30 days old received from any certified MBE subcontractor, the amount of each invoice, and the reason payment has not been made.

3. The MBE Liaison and/or the Public School Construction Program will conduct reviews as deemed necessary to confirm compliance with the minority business enterprise participation requirements.
4. The MBE Liaison will maintain appropriate records, and shall assist the Public School Construction Program in on-site or post-audit reviews upon request.
5. Auditors from the Public School Construction Program will have access to and the ability to audit MBE participation for specific projects, information retained by the LEA, and/or submitted to the IAC in reports/forms filed by the LEA as referenced above.

9.0 MINORITY BUSINESS ENTERPRISE LIAISON

1. The Superintendent shall designate an individual to be identified as the MBE Liaison for the school system.
2. The MBE Liaison will be the contact person who will work with the Public School Construction Program and the Governor's Office of Minority Affairs to implement the Minority Business Enterprise Program for the school system and the State of Maryland.
3. The Superintendent will immediately notify the Public School Construction Program if there is a change in the MBE Liaison for the school system.

**CERTIFIED MINORITY BUSINESS ENTERPRISE
UTILIZATION AND FAIR SOLICITATION AFFIDAVIT**

NOTE: You must include this document with your bid or offer. If you do not submit the form with your bid or offer, the procurement officer shall deem your bid non-responsive or your offer not reasonably susceptible of being selected for award.

* * * * *

Part I.

I acknowledge the:

- Overall certified MBE subcontract participation goal of ____ %.
- The subgoals, if applicable, of:
 - ____ % for certified African American-owned businesses and
 - ____ % for certified Asian American-owned businesses.

I have made a good-faith effort to achieve this goal. If awarded the contract, I will continue to attempt to increase MBE participation during the project.

Part II.

Check ONE Box

NOTE: FAILURE TO CHECK ONE OF BOXES 1, 2, or 3 BELOW WILL RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

NOTE: INCONSISTENCY BETWEEN THE ASSERTIONS ON THIS FORM AND THE INFORMATION PROVIDED ON THE *MBE PARTICIPATION SCHEDULE* (ATTACHMENT B) MAY RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

- 1 I have met the overall MBE goal and MBE subgoals for this project. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details how I will reach that goal.
- or**
- 2 After having made a good-faith effort to achieve the overall MBE goal and MBE subgoals for this project, I can achieve partial success only. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details the MBE participation I have achieved.

I request a partial waiver as follows:

- Waiver of overall MBE subcontract participation goal: ____ %
- Waiver of MBE subcontract participation subgoals, if applicable:
 - ____ % for certified African American-owned businesses and
 - ____ % for certified Asian American-owned businesses.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

or

- 3 After having made a good faith effort to achieve the overall MBE goal and MBE subgoals for this project, I am unable to achieve any portion of the goal or subgoals. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B].

I request a full waiver.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

Part III.

I understand that if I am the apparent awardee or conditional awardee, I must submit **within 10 working days** after receiving notice of the potential award or within 10 days after the date of conditional award - whichever is earlier - the:

- *Outreach Efforts Compliance Statement* (Attachment C)
- *Subcontractor Project Participation Statement* (Attachment D)
- *Minority Subcontractors Unavailability Certificate* (Attachment E) (if applicable)
- Any other documentation the Procurement Officer requires to ascertain my responsibility in connection with the MBE participation goal and subgoals

I acknowledge that if I fail to timely return complete documents, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award. If the contract has been awarded, the award is voidable.

I acknowledge that the MBE subcontractors/suppliers listed in the *MBE Participation Schedule* and any additional MBE subcontractor/suppliers identified in the *Subcontractor Project Participation Statement* will be used to accomplish the percentage of MBE participation that I intend to achieve.

In the solicitation of subcontract quotations or offers, MBE subcontractors were provided the same information and amount of time to respond as were non-MBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MBE subcontractors at a competitive disadvantage to non-MBE subcontractors.

I solemnly affirm under the penalties of perjury that this Affidavit is true to the best of my knowledge, information, and belief.

Bidder/Offeror Name

Affiant Signature

Address

Printed Name & Title

Address (continued)

Date

Attachment B

MBE PARTICIPATION SCHEDULE

This document must be included with the bid or offer. If the bidder or offeror fails to submit this form with the bid or offer as required, the procurement officer shall deem the bid non-responsive or shall determine that the offer is not reasonably susceptible of being selected for award.

1. Prime Contractor's Name	2. Prime Contractor's Address and Telephone Number
3. Project/School Name	4. Project/School Location
5. LEA Baltimore County Schools PSC No.	6. Base Bid Amount \$
7a. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number _____ Minority Firm Fax Number _____ MDOT Certification Number _____	Minority Group Type <input type="checkbox"/> (African American) <input type="checkbox"/> (Women) <input type="checkbox"/> (Asian) <input type="checkbox"/> (Hispanic) <input type="checkbox"/> (American Indian) <input type="checkbox"/> (Disabled)
Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
7b. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number _____ Minority Firm Fax Number _____ MDOT Certification Number _____	Minority Group Type <input type="checkbox"/> (African American) <input type="checkbox"/> (Women) <input type="checkbox"/> (Asian) <input type="checkbox"/> (Hispanic) <input type="checkbox"/> (American Indian) <input type="checkbox"/> (Disabled)
Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
7c. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number _____ Minority Firm Fax Number _____ MDOT Certification Number _____	Minority Group Type <input type="checkbox"/> (African American) <input type="checkbox"/> (Women) <input type="checkbox"/> (Asian) <input type="checkbox"/> (Hispanic) <input type="checkbox"/> (American Indian) <input type="checkbox"/> (Disabled)
Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
8. MBE Total Dollar Amount	9. Total MBE Percent of Entire Contract
10. Form Prepared by : Name _____ Title _____ Date _____	11. Reviewed and Accepted by Board of Education MBE Liaison Name _____ Title _____ Date _____

Total MBE Participation: (See Boxes 8 & 9)	_____ %	\$ _____
Total African-American MBE Participation:	_____ %	\$ _____
Total Asian American-Owned MBE Participation:	_____ %	\$ _____
Total Other Participation:	_____ %	\$ _____

Attachment C

OUTREACH EFFORTS COMPLIANCE STATEMENT

In conjunction with the bid or offer submitted in response to Baltimore County Public Schools for the _____ project, PSC # _____, I state the following:
(name)

- 1) Bidder/Offeror identified opportunities to subcontract in these specific work categories:

- 2) Attached to this form are copies of written solicitations (with bidding instructions) used to solicit certified MBEs for these subcontract opportunities.

- 3) Bidder/Offeror made the following attempts to contact personally the solicited MBEs:

- 4) Bidder/Offeror assisted MBEs to fulfill or to seek waiver of bonding Requirements (Described Efforts)
 This project does not involve bonding requirements.

- 5) Bidder/Offeror did/did not attend the pre-bid conference
 No pre-bid conference was held.

Company Name	By:	Name
Address		Title
		Date

Attachment D

MINORITY BUSINESS ENTERPRISES SUBCONTRACTOR PROJECT PARTICIPATION STATEMENT

PROJECT/ SCHOOL NAME: _____

PROJECT/ SCHOOL LOCATION: _____

LEA: Baltimore County Public Schools

NAME OF PRIME CONTRACTOR:

NAME OF MBE SUBCONTRACTOR: _____

MDOT Certification Number

1. Work/Services to be performed by MBE Subcontractor: _____

2. Subcontract Amount: \$ _____

3. Bonds - Amount and type required of Subcontractor if any: _____

4. MBE Anticipated or Actual Commencement Date: _____ Completion Date: _____

5. This MBE subcontract represents the following percentage of the total contract cost: _____

6. This is an African American Firm: Yes _____ No _____

7. This is an Asian American Owned Firm: Yes _____ No _____

8. This is a Woman, American Indian, Hispanic or Disabled Firm: Yes _____ No _____

(Circle One)

**

The undersigned subcontractor and prime contractor will enter into a contract for the work/service indicated above upon the prime contractor's execution of a contract for the above referenced project with the Board of Education. The undersigned subcontractor is a MDOT certified Minority Business Enterprise. The terms and conditions stated above are consistent with our agreements.

Signature of Subcontractor: _____

Date: _____

The term and conditions stated above are consistent with our agreements.

Signature of Prime Contractor: _____

Date: _____

MINORITY SUBCONTRACTOR UNAVAILABILITY CERTIFICATE

1. It is hereby certified that the firm of _____
(Name of Minority firm)

located at _____
(Number) (Street)

(City) (State) (Zip)

was offered an opportunity to bid on the _____ school project in
Baltimore County by _____
(Name of Prime Contractor's Firm)

*

2. The _____ (Minority Firm), is either unavailable for the
work/service or unable to prepare a bid for this project for the following reason(s):

Signature of Minority Firm's MBE Representative Title Date

MDOT Certification # Telephone #

3. To be completed by the prime contractor if Section 2 of this form is not completed by the minority firm.

To the best of my knowledge and belief, said Certified Minority Business Enterprise is either unavailable for the work/service for this project, is unable to prepare a bid, or did not respond to a request for a price proposal and has not completed the above portion of this submittal.

Signature of Prime Contractor Title Date

Attachment F

MBE WAIVER DOCUMENTATION

Project Name: _____ PSC No. _____

Base Contract Amount \$ _____

Plus Accepted Alternates _____

Equals Total Contract Amount \$ _____

I have previously requested that a waiver be granted to the overall MBE goal for this project of ____ percent, with a minimum of ____ percent from certified African American-owned businesses, a minimum of ____ percent from certified Asian American-owned businesses, and the balance from all certified minority business enterprises, if applicable. This would include the total dollar value of all materials, supplies, equipment, and services, including construction services directly or indirectly, from Minority Business Enterprises (MBE) which are currently certified by the Maryland Department of Transportation (MDOT).

I _____, hereby certify that my position is
 (Name of Company Representative)
 _____, and I am the duly authorized representative of
 (Position Title)

 (Company Name)

I further certify that I have submitted a *Schedule for Participation of Certified Minority Business Enterprises* which reflects the percentage and dollar value of certified Minority Business Enterprise participation which my company expects to achieve for this contract. Therefore, the request for the waiver is as follows:

Summary MBE Participation Schedule from Attachment B

Minority Group	MBE GOAL		Actual MBE Dollar Participation		Request For Waiver	
	Percent of Total Contract	Dollar Value of Total Contract*	Dollar Value	Percent of Total Contract	Dollar Value	Percent of Total Contract
a. Sub Goal African American						
b. Sub Goal Asian American						
c. Other * in Sub Goal group a/b above						
TOTALS						

* with accepted/rejected alternates

To support this request for a waiver, I include the following information as attachments which I certify to be true to the best of my knowledge.

1. A detailed statement of the efforts made by the contractor to identify and select portions of the work proposed to be performed by subcontractors in order to increase the likelihood of achieving the stated goal;
2. A detailed statement of the efforts made by the contractor prior to and up to 10 days before the bid opening to solicit minority business enterprises through written notices that describe the categories of work for which subcontracting is being solicited, the type of work to be performed, and specific instructions on how to submit a bid;
3. A detailed statement of the contractor's efforts to make personal contact with MBE firms identified for Item 2. above;
4. A record of the name, address, telephone number, and dates contacted for each MBE identified under items 2. and 3. above;
5. A description of the information provided to MBE's regarding the plans, specifications and the anticipated time schedule for portions of the work to be performed;
6. Information on activities to assist minority business enterprises to fulfill bonding requirements, or to obtain a waiver of these requirements;
7. Information on activities to publicize contracting opportunities to minority business enterprises, attendance at pre-bid meetings, or other meetings scheduled by the MBE Liaison or designated representative;
8. As to each MBE that placed a subcontract quotation or offer which the apparent low bidder or successful offeror considers not to be acceptable, a detailed statement of reasons for this conclusion; and
9. A list of minority subcontractors found to be unavailable. This shall be accompanied by a Minority Subcontractor Unavailability Certificate signed by the minority business enterprise or from the apparent low bidder or successful offeror indicating that the minority business did not provide the written certification.

Signature _____ Date _____
(Company Representative Name)

Sworn and subscribed before me this _____ day.

of _____ in the year _____ Notary Public _____

Reviewed and accepted by the Baltimore County Board of Education MBE Liaison.

Signature _____ Date _____
(County Representative Name)

MBE Request For Waiver Master Form (July 2002)

**CERTIFIED MINORITY BUSINESS ENTERPRISE PARTICIPATION
STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT**

LEA: _____ DATE: _____
 FACILITY NAME: _____ PSC NO: _____
 SCOPE OF WORK: _____ REQ NO: _____

Name of MBE Sub-Contractor	MDOT Certification Number and Classification	TOTAL MBE Contract Amount	Amount to be Paid THIS Requisition	TOTAL Paid to Date	MBE has Received FINAL Payment?	If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE
	TOTAL:	\$ -	\$ -	\$ -		

MDOT Certification Number and Classification can be located at <http://mbe.state.mdot.state.md.us/directory/>

MBE Classification:

- | | |
|-----------------------|------------------------------|
| African American = AA | African American/Women = AAW |
| Hispanic American = H | Hispanic American/Women = HW |
| Native American = N | Native American/Women = NW |
| Asian American = A | Asian American/Women = AW |
| Women = W | |

I certify that the figures and information presented above represent accurate and true statements, that timely payments have been and will be made to suppliers and subcontractors on this project as requisitioned payments are received, and in accordance with our contracts.

Name of Contractor Firm	Authorized Contractor Signature/Date
Contractor Federal Tax ID #	Contractor MBE Classification # (if applicable)
Name of LEA MBE Liaison (Printed)	Signature of LEA MBE Liaison/Date

CERTIFIED MINORITY BUSINESS ENTERPRISE PARTICIPATION STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

Instructions for Completion of IAC/PSCP Form 306.4 Page 3

THIS FORM TO BE COMPLETED BY PRIME CONTRACTOR ONLY

1. **LEA** – Enter full name of LEA.
2. **Facility Name** – Enter full name of school/facility.
3. **Scope of Work** – Enter type of work being performed (i.e. New, Renovation, Roof, HVAC, ASP – Flooring, QZAB – Media Center, etc.).
4. **Date** – Date of Requisition.
5. **PSC NO** – Enter full PSC Number as assigned by PSCP.
6. **REQ NO** – Enter the number of the corresponding Requisition for Payment.
7. **Name of MBE Sub-Contractor** – Enter full name of MBE Sub-Contractor.
8. **MDOT Certification Number & Classification** – Enter the 5 digit MDOT Certification number and corresponding MDOT Classification for each MBE Sub-Contractor. MDOT Classifications and the MDOT website are listed at the bottom of this form.
9. **TOTAL MBE Contract Amount** – Enter ORIGINAL Total MBE Contract Amount as stated on MBE Attachments B and D. This amount should NOT be altered with change order amounts, changes to scope of work, etc. which may affect contract amount.
10. **Amount to be Paid This Requisition** – Enter the amount to be paid to the MBE Sub-Contractor for work applicable to this requisition.
11. **TOTAL Paid to Date** – Enter the TOTAL amount paid to date to the MBE Sub-Contractor – this amount should NOT include the amount being paid on this requisition, only the total of prior payments.
12. **MBE has Received FINAL Payment** – Enter “YES” if the MBE Sub-Contractor has been paid in full. Enter “NO” if the MBE Sub-Contractor has NOT been paid in full.
13. **If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE** – Enter a brief reason for the MBE Sub-Contractor NOT being paid equal to or greater than the ORIGINAL Total MBE Contract Amount as stated on this form and MBE Attachments B & D. Additional documentation may be required to be submitted for variance explanations.
14. **Name of Contractor Firm** – Enter full name of Prime Contractor.
15. **Authorized Contractor Signature/Date** – The authorized individual employed by the Prime Contractor who filled this form out should date and sign here.
16. **Contractor Federal Tax ID #** – Enter the Federal Tax ID Number of the Prime Contractor.
17. **Contractor MBE Classification #** - Enter the MDOT MBE Classification Number if the Prime Contractor is a MDOT certified MBE Company.
18. **Name of LEA MBE Liaison** – PRINT the name of the LEA MBE Liaison (or other LEA authorized employee) responsible for VERIFYING ALL INFORMATION filled out by the Prime Contractor on this form.
19. **Signature of LEA MBE Liaison/Date** – Signature of the person VERIFYING ALL INFORMATION filled out by the Prime Contractor on this form (signature of person stated in Step #18.)

SECTION 00500 - AGREEMENT BETWEEN THE OWNER AND CONTRACTOR

PART I - GENERAL

1.1 RELATED DOCUMENTS

- A. The attached form AIA Document A101-2007 Edition shall serve as the basis for the contract between the Owner and the Contractor.
- B. All contractors are advised to carefully review and comply with all General terms and Conditions and General Requirements included in this Project Manual. The Standard Form of Agreement, General Conditions, including Supplemental Conditions herein, shall become a part of the Specifications and shall apply to all Contractors and Subcontractors. Failure to request and receive clarification of conflicting or ambiguous General Requirement does not constitute a waiver of related responsibilities for any Bid Package. Where ambiguities or conflicts exist relative to the General Conditions, the most stringent requirements apply.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00500

**Victory Villa Elementary School
Replacement School
PSCP #03.057.17 LP
ARA-209-17**

AIA[®] Document A101[™] – 2007

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the _____ day of _____ in the year _____
(In words, indicate day, month and year)

BETWEEN the Owner:
(Name, address and other information)

Board of Education of Baltimore County
6901 Charles Street
Towson, MD 21204

and the Contractor:
(Name, address and other information)

for the following Project:
(Name, location, and detailed description)

The Architect:
(Name, address and other information)

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

AIA Document A201[™]–2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS
- 10 INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

The commencement date will be fixed in a notice to proceed.

If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

§ 3.2 The Contract Time shall be measured from the date of commencement.

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than () days from the date of commencement, or as follows:

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

The Contractor shall achieve Substantial Completion of the entire Work not later than

Init.

Portion of Work

Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents.
(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

Subject to liquidated damages as provided in the Contract Documents.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 4.3 Unit prices, if any:
(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit
------	-----------------------	----------------

§ 4.4 Allowances included in the Contract Sum, if any:
(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Price
------	-------

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Within ten (10) days after receipt of the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4) from the Contractor, the Architect shall process and forward the approved requisition to the Owner. Within forty-five (45) days after receipt of the Standard Monthly Contractor's Requisition for Payment the Owner will endeavor to make payment to the Contractor of the amount specified in the Requisition for Payment which shall include all applicable retention.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

Init.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of Ten percent (10.00%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™–2007, General Conditions of the Contract for Construction; At 50% completion of the project, retainage shall be reduced to 5% of the invoiced Contract amount.
- .2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of Ten percent (10.00%);
- .3 Subtract the aggregate of previous payments made by the Owner; and
- .4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

§ 5.1.7 The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

- .1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to ninety-five percent (95%) of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
(Section 9.8.5 of AIA Document A201–2007 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)
- .2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201–2007.

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:

(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

As may be subsequently agreed to by the Owner and the Contractor.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 FINAL PAYMENT

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 45 days after the issuance of the Architect's final Certificate for Payment, or as follows:

ARTICLE 6 DISPUTE RESOLUTION

Refer to Article 4 of AIA Document A201-1997.

Init.

(Paragraphs deleted)

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2

(Paragraphs deleted)

All references in this Contract of AIA Document A201-2007 shall be replaced with AIA Document A201-1997.

§ 8.3 The Owner's representative:

(Name, address and other information)

The Owner's representative will be named prior to the start of actual construction.

§ 8.4 The Contractor's representative:

(Name, address and other information)

The Contractor's representative will be named prior to the start of actual construction.

§ 8.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

§ 8.6 Other provisions:

None

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 9.1.1 The Agreement is this executed AIA Document A101–2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201–2007, General Conditions of the Contract for Construction.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
----------	-------	------	-------

§ 9.1.4 The Specifications:

(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Title of Specifications exhibit:

(Table deleted)

§ 9.1.5 The Drawings:

(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

Title of Drawings exhibit:

(Table deleted)

§ 9.1.6 The Addenda, if any:

Number

Date

Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

(Paragraphs deleted)

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201-2007.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201-2007.)

Type of insurance or bond

Limit of liability or bond amount (\$ 0.00)

This Agreement entered into as of the day and year first written above.

(Printed name and title)

(Printed name and title)

See signature page attached.

Init.

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year first written above.

Accepted by:

Insert Contractor's Name

(Seal)

Signature Owner/Partner/Corporate Officer

Witness

Typed/Printed Name and Title

Date

Accepted by:

BOARD OF EDUCATION OF BALTIMORE COUNTY

S. Dallas Dance, Ph.D.
Superintendent of Schools
Baltimore County Public Schools

Lawrence E. Schmidt
President
Board of Education of Baltimore County

APPROVED FOR LEGAL FORM AND SUFFICIENCY*
(Subject to Execution by a Duly Authorized
Superintendent and President of the Board
of Education of Baltimore County)

OFFICE OF LAW
*Approval of Legal Form and Sufficiency
Does not Convey Approval or Disapproval
Of the Substantive Nature of this Transaction.
Approval is Based Upon Typeset Document-
All Modifications Require Re-Approval.

SECTION 00510 - APPLICATION FOR PAYMENT (*State funded*)

PART 1 - GENERAL

1.1 RELATED PRODUCTS

A. APPLICATION FOR PAYMENT

1. The STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT, IAC/PSCP Form 306.4, included herein, is a sample of the monthly application for payment form to be used by the Contractor. Upon request by the contractor, the owner will provide an electronic copy of this document in Excel format.

B. THE ARCHITECT'S CERTIFICATE OF PAYMENT

1. The Architect's signature on the IAC/PSCP Form 306.4 constitutes certification of payment.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 00510

**STANDARD MONTHLY CONTRACTOR'S
REQUISITION FOR PAYMENT**

IAC/PSCP FORM 306.4

PAGE 1 OF 31

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
00 00 00	PROCUREMENT & CONTRACTING REQUIREMENTS	0.00		0.00	0.00	0.00
01 00 00	GENERAL REQUIREMENTS	0.00		0.00	0.00	0.00
02 00 00	EXISTING CONDITIONS	0.00		0.00	0.00	0.00
03 00 00	CONCRETE	0.00		0.00	0.00	0.00
04 00 00	MASONRY	0.00		0.00	0.00	0.00
05 00 00	METALS	0.00		0.00	0.00	0.00
06 00 00	WOOD, PLASTICS & COMPOSITES	0.00		0.00	0.00	0.00
07 00 00	THERMAL & MOIST. PROTECTION	0.00		0.00	0.00	0.00
08 00 00	OPENINGS	0.00		0.00	0.00	0.00
09 00 00	FINISHES	0.00		0.00	0.00	0.00
10 00 00	SPECIALTIES	0.00		0.00	0.00	0.00
11 00 00	EQUIPMENT	0.00		0.00	0.00	0.00
12 00 00	FURNISHINGS	0.00		0.00	0.00	0.00
13 00 00	SPECIAL CONSTRUCTION	0.00		0.00	0.00	0.00
14 00 00	CONVEYING EQUIPMENT	0.00		0.00	0.00	0.00
21 00 00	FIRE SUPPRESSION	0.00		0.00	0.00	0.00
22 00 00	PLUMBING	0.00		0.00	0.00	0.00
23 00 00	HVAC	0.00		0.00	0.00	0.00
25 00 00	INTEGRATED AUTOMATION	0.00		0.00	0.00	0.00
26 00 00	ELECTRICAL	0.00		0.00	0.00	0.00
27 00 00	COMMUNICATIONS	0.00		0.00	0.00	0.00
28 00 00	ELECTRONIC SAFETY & SECURITY	0.00		0.00	0.00	0.00
31 00 00	EARTHWORK	0.00		0.00	0.00	0.00
32 00 00	EXTERIOR IMPROVEMENTS	0.00		0.00	0.00	0.00
33 00 00	UTILITIES	0.00		0.00	0.00	0.00
34 00 00	TRANSPORTATION	0.00		0.00	0.00	0.00
35 00 00	WATERWAY & MARINE CONSTRUCTION	0.00		0.00	0.00	0.00
40 00 00	PROCESS INTEGRATED	0.00		0.00	0.00	0.00
41 00 00	MATERIAL PROCESSING & HANDLING EQUIPMENT	0.00		0.00	0.00	0.00
42 00 00	PROCESS HEATING, COOLING & DRYING EQUIPMENT	0.00		0.00	0.00	0.00
43 00 00	PROCESS GAS LIQUID & HANDLING & PURIFICATION & STORAGE	0.00		0.00	0.00	0.00
44 00 00	POLLUTION & WASTE CONTROL EQUIPMENT	0.00		0.00	0.00	0.00
45 00 00	INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT	0.00		0.00	0.00	0.00
46 00 00	WATER & WASTE WATER EQUIPMENT	0.00		0.00	0.00	0.00
48 00 00	ELECTRICAL POWER GENERATION	0.00		0.00	0.00	0.00
	TOTAL	0.00		0.00	0.00	0.00
	CHANGE ORDERS	0.00		0.00	0.00	0.00
	MATERIAL STORED			0.00	0.00	0.00
	TOTAL ADJUSTED	0.00		0.00	0.00	0.00
	LESS: RETAINAGE					
	TOTAL	0.00		0.00	0.00	0.00

I certify the above estimates and that timely payments have been (except initial submission), and will be, made to suppliers and subcontractors on this project, as requisitioned payments are received, and in accordance with our contracts.

Name of Contractor Firm

Authorized Signature

**STANDARD MONTHLY CONTRACTOR'S
REQUISITION FOR PAYMENT**

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

I certify the above estimates and that timely payments have been (except initial submission), and will be, made to suppliers and subcontractors on this project, as requisitioned payments are received, and in accordance with our contracts.

Name of Contractor Firm

Authorized Signature

NOTARIZATION

County _____, to wit:

I hereby certify that on this _____ day of _____ in the year of _____, before me, a Notary Public for said County, personally appeared _____, and made oath in due form of law that he/she is _____ of _____, and on behalf of said firm stated that the matters and facts set forth in the foregoing verification are true to the best of his/her knowledge, information and belief. He/she acknowledged that he/she executed the same purposes herein contained and that they had full authority to execute same.

As witness my hand and official seal:

NOTARY PUBLIC

My commission expires _____.

Reviewed and agreed justified to the best of my knowledge:

Architect Signature/Date

Signature of LEA Representative/Date

Remarks:

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools
 FACILITY NAME: _____
 SCOPE OF WORK: _____

DATE: _____
 PSC NO: _____
 REQ NO: _____

Name of MBE Sub-Contractor	MDOT Certification Number and Classification	TOTAL MBE Contract Amount	Amount to be Paid THIS Requisition	TOTAL Paid to Date	MBE has Received FINAL Payment?	If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE
TOTAL:		\$ -	\$ -	\$ -		

MDOT Certification Number and Classification can be located at <http://mbe.state.mdot.state.md.us/directory/>

MBE Classification:

- | | |
|-----------------------|------------------------------|
| African American = AA | African American/Women = AAW |
| Hispanic American = H | Hispanic American/Women = HW |
| Native American = N | Native American/Women = NW |
| Asian American = A | Asian American/Women = AW |
| Women = W | |

I certify that the figures and information presented above represent accurate and true statements, that timely payments have been and will be made to suppliers and subcontractors on this project as requisitioned payments are received, and in accordance with our contracts.

 Name of Contractor Firm

 Contractor Federal Tax ID #

 Name of LEA MBE Liaison (Printed)

 Authorized Contractor Signature/Date

 Contractor MBE Classification # (if applicable)

 Signature of LEA MBE Liaison/Date

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

IAC/PSCP FORM 306.4

PAGE 4 OF 31

Instructions for Completion of IAC/PSCP Form 306.4 Page 3

THIS FORM TO BE COMPLETED BY PRIME CONTRACTOR ONLY

1. **LEA** – Enter full name of LEA.
2. **Facility Name** – Enter full name of school/facility.
3. **Scope of Work** – Enter type of work being performed (i.e. New, Renovation, Roof, HVAC, ASP – Flooring, QZAB – Media
4. **Date** – Date of Requisition.
5. **PSC NO** – Enter full PSC Number as assigned by PSCP.
6. **REQ NO** – Enter the number of the corresponding Requisition for Payment.
7. **Name of MBE Sub-Contractor** – Enter full name of MBE Sub-Contractor.
8. **MDOT Certification Number & Classification** – Enter the 5 digit MDOT Certification number and corresponding MDOT
9. **TOTAL MBE Contract Amount** – Enter ORIGINAL Total MBE Contract Amount as stated on MBE Attachments B and D.
10. **Amount to be Paid This Requisition** – Enter the amount to be paid to the MBE Sub-Contractor for work applicable to this
11. **TOTAL Paid to Date** – Enter the TOTAL amount paid to date to the MBE Sub-Contractor – this amount should NOT
12. **MBE has Received FINAL Payment** – Enter “YES” if the MBE Sub-Contractor has been paid in full. Enter “NO” if the
13. **If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE** – Enter a brief reason for the MBE
14. **Name of Contractor Firm** – Enter full name of Prime Contractor.
15. **Authorized Contractor Signature/Date** – The authorized individual employed by the Prime Contractor who filled this
16. **Contractor Federal Tax ID #** – Enter the Federal Tax ID Number of the Prime Contractor.
17. **Contractor MBE Classification #** - Enter the MDOT MBE Classification Number if the Prime Contractor is a MDOT
18. **Name of LEA MBE Liaison** – PRINT the name of the LEA MBE Liaison (or other LEA authorized employee) responsible
19. **Signature of LEA MBE Liaison/Date** – Signature of the person VERIFYING ALL INFORMATION filled out by the Prime

**STANDARD MONTHLY CONTRACTOR'S
REQUISITION FOR PAYMENT**

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
00 00 00	PROCUREMENT & CONTRACTING REQUIREMENTS					
01 10 00	Solicitation					0.00
00 11 00	Advertisements & Invitations					0.00
00 20 00	Instructions for Procurement					0.00
00 21 00	Instructions					0.00
00 22 00	Supplementary Instructions					0.00
00 23 00	Procurement Definitions					0.00
00 24 00	Procurement Scopes					0.00
00 25 00	Procurement Meetings					0.00
00 26 00	Procurement Substitution Procedures					0.00
00 30 00	Available Information					0.00
00 31 00	Available Project Information					0.00
00 40 00	Procurement Forms & Supplements					0.00
00 41 00	Bid Forms					0.00
00 42 00	Proposal Forms					0.00
00 43 00	Procurement form Supplements					0.00
00 45 00	Representations & Certifications					0.00
00 50 00	Contracting Forms & Supplements					0.00
00 51 00	Notice of Award					0.00
00 52 00	Agreement Forms					0.00
00 54 00	Agreement Form Supplements					0.00
00 55 00	Notice to Proceed					0.00
00 60 00	Project Forms					0.00
00 62 00	Certificates & Other Forms					0.00
00 63 00	Clarification & Modification Forms					0.00
00 65 00	Closeout forms					0.00
00 70 00	Conditions of the Contract					0.00
00 71 00	Contracting Definitions					0.00
00 72 00	General Conditions					0.00
00 73 00	Supplementary Definitions					0.00
00 90 00	Revisions, Clarifications, & Modifications					0.00
00 91 00	Pre-Contract Revisions					0.00
00 93 00	Record Clarifications & Proposals					0.00
00 94 00	Record Modifications					0.00
	Other					0.00
	TOTAL PROCUREMENT & CONTRACTING REQUIREMENTS	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
01 00 00	GENERAL REQUIREMENTS					
01 10 00	Summary					0.00
01 11 00	Summary of Work					0.00
01 12 00	Multiple Contract Summary					0.00
01 14 00	Work Restrictions					0.00
01 18 00	Project Utility Sources					0.00
01 20 00	Price & Payment Procedures					0.00
01 21 00	Allowances					0.00
01 22 00	Unit Prices					0.00
01 23 00	Alternates					0.00
01 24 00	Value Analysis					0.00
01 25 00	Substitution Procedures					0.00
01 26 00	Contract Modification Procedures					0.00
01 29 00	Payment Procedures					0.00
01 30 00	Administrative Requirements					0.00
01 31 00	Project Management & Coordination					0.00
01 32 00	Construction Progress Documentation					0.00
01 33 00	Submittal Procedures					0.00
01 35 00	Special Procedures					0.00
01 40 00	Quality Requirements					0.00
01 41 00	Regulatory Requirements					0.00
01 42 00	References					0.00
01 43 00	Quality Assurance					0.00
01 45 00	Quality Control					0.00
01 50 00	Temporary Facilities & Controls					0.00
01 51 00	Temporary Utilities					0.00
01 52 00	Construction Facilities					0.00
01 54 00	Construction Aids					0.00
01 55 00	Vehicular Access & Parking					0.00
01 56 00	Temporary Barriers & Enclosures					0.00
01 57 00	Temporary Controls					0.00
01 57 00	Project Identification					0.00
01 60 00	Product Requirements					0.00
01 61 00	Common Product Requirements					0.00
01 62 00	Product Options					0.00
01 64 00	Owner-Furnished Products					0.00
01 65 00	Product Delivery Requirements					0.00
01 66 00	Product Storage & Handling Requirements					0.00
01 70 00	Execution & Closeout Requirements					0.00
01 51 00	Examination & Preparation					0.00
01 73 00	Execution & Closeout Requirements					0.00
01 74 00	Cleaning & Waste Management					0.00
01 75 00	Starting & Adjusting					0.00
01 76 00	Protecting Installed Construction					0.00
01 77 00	Closeout Procedures					0.00
01 78 00	Closeout Submittals					0.00
01 79 00	Demonstration & Training					0.00
01 80 00	Performance Requirements					0.00
01 81 00	Facility Performance Requirements					0.00
01 82 00	Facility Substructure Performance Requirements					0.00
01 83 00	Facility Shell Performance Requirements					0.00
01 84 00	Interiors Performance Requirements					0.00
01 85 00	Conveying Equipment Performance Requirements					0.00
01 86 00	Facility Services performance Requirements					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
01 87 00	Equipment & Furnishings Performance Requirements					0.00
01 88 00	Other Facility Construction Performance Requirements					0.00
01 89 00	Site Construction Performance Requirements					0.00
01 90 00	Life Cycle Activities					0.00
01 91 00	Commissioning					0.00
01 92 00	Facility Operation					0.00
01 93 00	Facility Maintenance					0.00
01 94 00	Facility Decommissioning					0.00
	Other					0.00
	TOTAL GENERAL REQUIREMENTS	0.00		0.00	0.00	0.00
02 00 00	EXISTING CONDITIONS					
02 01 00	Maintenance of Existing Conditions					0.00
02 05 00	Common Work Results for Existing Conditions					0.00
02 06 00	Schedules for Existing Conditions					0.00
02 08 00	Commissioning of Existing Conditions					0.00
02 20 00	Assessment					0.00
02 21 00	Surveys					0.00
02 22 00	Existing Conditions Assessment					0.00
02 24 00	Environmental Assessment					0.00
02 25 00	Existing Material Assessment					0.00
02 26 00	Hazardous Material Assessment					0.00
02 30 00	Subsurface Investigation					0.00
02 31 00	Geophysical Investigations					0.00
02 32 00	Geotechnical Investigation					0.00
02 40 00	Demolition & Structure Moving					0.00
02 41 00	Demolition & Structure Moving					0.00
02 42 00	Removal & Salvage of Construction Materials					0.00
02 43 00	Structure Moving					0.00
02 50 00	Site Remediation					0.00
02 51 00	Physical Decontamination					0.00
02 52 00	Chemical Decontamination					0.00
02 53 00	Thermal Decontamination					0.00
02 54 00	Biological Decontamination					0.00
02 55 00	Remediation Soil Stabilization					0.00
02 56 00	Site Containment					0.00
02 57 00	Sinkhole Remediation					0.00
02 58 00	Snow Control					0.00
02 60 00	Contaminated Site Material Removal					0.00
02 61 00	Removal & Disposal of Contaminated Soils					0.00
02 62 00	Hazardous Waste Recovery Processes					0.00
02 65 00	Underground Storage Tank Removal					0.00
02 66 00	Landfill Construction & Storage					0.00
02 70 00	Water Remediation					0.00
02 71 00	Groundwater Treatment					0.00
02 72 00	Water Decontamination					0.00
02 80 00	Facility Remediation					0.00
02 81 00	Transportation & Disposal of Hazardous Material					0.00
02 82 00	Asbestos Remediation					0.00
02 83 00	Lead Remediation					0.00
02 84 00	Polychlorinated Biphenyl Remediation					0.00
02 85 00	Mold remediation					0.00
02 86 00	Hazardous Waste Drum Handling					0.00
	Other					0.00
	TOTAL EXISTING CONDITIONS	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
03 00 00	CONCRETE					
03 01 00	Maintenance of Concrete					0.00
03 05 00	Common Work Results for Concrete					0.00
03 06 00	Schedules for Concrete					0.00
03 08 00	Commissioning of Concrete					0.00
03 10 00	Concrete Forming & Accessories					0.00
03 11 00	Concrete Forming & Accessories					0.00
03 15 00	Concrete Accessories					0.00
03 20 00	Concrete Reinforcing					0.00
03 21 00	Reinforcement Bars					0.00
03 22 00	Fabric & Grid Reinforcing					0.00
03 23 00	Stressed Tendon Reinforcing					0.00
03 24 00	Fibrous Reinforcing					0.00
02 35 00	Composite Reinforcing					0.00
03 30 00	Cast-in-Place Concrete					0.00
03 31 00	Structural Concrete					0.00
03 33 00	Architectural Concrete					0.00
03 34 00	Low Density Concrete					0.00
03 35 00	Concrete Finishing					0.00
03 37 00	Specialty Placed Concrete					0.00
03 38 00	Post-Tensioned Concrete					0.00
03 39 00	Concrete Curing					0.00
03 40 00	Precast Concrete					0.00
03 41 00	Precast Structural Concrete					0.00
03 45 00	Precast Architectural Concrete					0.00
03 47 00	Site-Cast Concrete					0.00
03 48 00	Precast Concrete Specialties					0.00
03 49 00	Glass-Fiber-Reinforced Concrete					0.00
03 50 00	Cast Decks & Underlayment					0.00
03 51 00	Cast Roof Decks					0.00
03 52 00	Lightweight Concrete Roof Insulation					0.00
03 53 00	Concrete Topping					0.00
03 54 00	Cast underlayment					0.00
03 60 00	Grouting					0.00
03 61 00	Cementitious Grouting					0.00
03 62 00	Non-Shrink Grouting					0.00
03 63 00	Epoxy Grouting					0.00
03 64 00	Injection Grouting					0.00
03 70 00	Mass Concrete					0.00
03 71 00	Mass Concrete For Raft Foundations					0.00
03 72 00	Mass Concrete for Dams					0.00
03 80 00	Concrete Cutting & Boring					0.00
03 81 00	Concrete Cutting					0.00
03 82 00	Concrete Boring					0.00
	Other					0.00
	TOTAL CONCRETE	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
04 00 00	MASONRY					
04 01 00	Maintenance of Masonry					0.00
04 05 00	Common Work Results for Masonry					0.00
04 06 00	Schedules for Masonry					0.00
04 08 00	Commissioning of Masonry					0.00
04 20 00	Unit Masonry					0.00
04 21 00	Clay Unit Masonry					0.00
04 22 00	Concrete Unit Masonry					0.00
04 22 00.13	Concrete Unit Veneer Masonry					0.00
04 22 00.16	Surface-Bonded Concrete Unit Masonry					0.00
04 23 00	Glass Unit Masonry					0.00
04 24 00	Adobe Unit Masonry					0.00
04 25 00	Unit Masonry Panels					0.00
04 26 00	Single-Wythe Unit Masonry					0.00
04 27 00	Multiple-Wythe Unit Masonry					0.00
04 28 00	Concrete Form Masonry Units					0.00
04 29 00	Engineered Unit Masonry					0.00
04 40 00	Stone Assemblies					0.00
04 41 00	Dry-Placed Stone					0.00
04 42 00	Exterior Stone Cladding					0.00
04 43 00	Stone Masonry					0.00
04 50 00	Refractory Masonry					0.00
04 51 00	Flue Liner Masonry					0.00
04 52 00	Combustion Chamber Masonry					0.00
04 53 00	Castable Refractory Masonry					0.00
04 54 00	Refractory Brick Masonry					0.00
04 57 00	Masonry Fireplaces					0.00
04 60 00	Corrosion-Resistant Masonry					0.00
04 61 00	Chemical-Resistant Brick Masonry					0.00
04 62 00	Vitrified Clay Liner Plate					0.00
04 70 00	Manufactured Masonry					0.00
04 71 00	Manufactured Brick Masonry					0.00
04 72 00	Cast Stone Masonry					0.00
04 73 00	Manufactured Stone Masonry					0.00
	Other					0.00
	TOTAL MASONRY	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
05 00 00	METALS					
05 01 00	Maintenance of Metals					0.00
05 05 00	Common Work Results for Metals					0.00
05 06 00	Schedules for Metals					0.00
05 08 00	Commissioning of Metals					0.00
05 10 00	Structural Metal Framing					0.00
05 12 00	Structural Steel Framing					0.00
05 13 00	Structural Stainless-Steel Framing					0.00
05 14 00	Structural Aluminum Framing					0.00
05 15 00	Wire Rope Assemblies					0.00
05 16 00	Structural Cabling					0.00
05 17 00	Structural Rod Assemblies					0.00
05 19 00	Tension Rod & Cable Truss Assemblies					0.00
05 20 00	Metal Joists					0.00
05 21 00	Steel Joist Framing					0.00
05 25 00	Aluminum Joist Framing					0.00
05 30 00	Metal Decking					0.00
05 31 00	Steel Decking					0.00
05 33 00	Aluminum Decking					0.00
05 34 00	Acoustical Metal Decking					0.00
05 35 00	Raceway Decking Assemblies					0.00
05 36 00	Composite Metal Decking					0.00
05 40 00	Cold-Formed Metal Framing					0.00
05 41 00	Structural Metal Stud Framing					0.00
05 42 00	Cold-Formed Metal Joist Framing					0.00
05 43 00	Slotted Channel Framing					0.00
05 44 00	Cold-Formed Metal Trusses					0.00
05 45 00	Metal Support Assemblies					0.00
05 50 00	Metal Fabrications					0.00
05 51 00	Metal Stairs					0.00
05 52 00	Metal Railings					0.00
05 53 00	Metal Gratings					0.00
05 54 00	Metal Floor Plates					0.00
05 55 00	Metal Stair Treads & Nosings					0.00
05 56 00	Metal Castings					0.00
05 58 00	Formed Metal Fabrications					0.00
05 59 00	Metal Specialties					0.00
05 70 00	Decorative Metal					0.00
05 71 00	Decorative Metal Stairs					0.00
05 73 00	Decorative Metal Railings					0.00
05 74 00	Decorative Metal Castings					0.00
05 75 00	Decorative Formed Metal					0.00
05 76 00	Decorative Forged Metal					0.00
	Other					0.00
	TOTAL METALS	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
06 00 00	WOOD, PLASTICS, & COMPOSITES					
06 01 00	Maintenance of Wood, Plastics, & Composites					0.00
06 05 00	Common Work Results for Wood, Plastics, & Composites					0.00
06 06 00	Schedules for Wood, Plastics, & Composites					0.00
06 08 00	Commissioning of Wood, Plastics, & Composites					0.00
06 10 00	Rough Carpentry					0.00
06 11 00	Wood Framing					0.00
06 12 00	Structural Panels					0.00
06 13 00	Heavy Timber Construction					0.00
06 14 00	Treated Wood Foundations					0.00
06 15 00	Wood Decking					0.00
06 16 00	Sheathing					0.00
06 17 00	Shop-Fabricated Structural Wood					0.00
06 18 00	Glued-Laminated Construction					0.00
06 20 00	Finish Carpentry					0.00
06 22 00	Millwork					0.00
06 25 00	Prefinished Paneling					0.00
06 26 00	Board Paneling					0.00
06 40 00	Architectural Woodwork					0.00
06 41 00	Architectural Wood Casework					0.00
06 42 00	Wood Paneling					0.00
06 43 00	Wood Stairs & Railing					0.00
06 44 00	Ornamental Woodwork					0.00
06 46 00	Wood Trim					0.00
06 48 00	Wood Frames					0.00
06 49 00	Wood Screens & Exterior Wood Shutters					0.00
06 50 00	Structural Plastics					0.00
06 51 00	Structural Plastic Shapes & Plates					0.00
06 52 00	Plastic Structural Assemblies					0.00
06 53 00	Plastic Decking					0.00
06 60 00	Plastic Fabrications					0.00
06 61 00	Simulated Stone Fabrications					0.00
06 63 00	Plastic Railings					0.00
06 64 00	Plastic Paneling					0.00
06 65 00	Plastic Simulated Wood Trim					0.00
06 66 00	Custom Ornamental Simulated Woodwork					0.00
06 70 00	Structural Composites					0.00
06 71 00	Structural Composite Shapes & Plates					0.00
06 72 00	Composite Structural Assemblies					0.00
06 73 00	Composite Decking					0.00
06 74 00	Composite Gratings					0.00
06 80 00	Composite Fabrications					0.00
06 81 00	Composite Railing					0.00
06 83 00	Composite Paneling					0.00
	Other					0.00
	TOTAL WOOD, PLASTICS, & COMPOSITES	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
07 00 00	THERMAL & MOISTURE PROTECTION					
07 01 00	Operation & Maintenance					0.00
07 05 00	Common Work Results for Thermal & Moisture Protection					0.00
07 06 00	Schedules for Thermal & Moisture Protection					0.00
07 08 00	Commissioning of Thermal & Moisture Protection					0.00
07 10 00	Damp-proofing & Waterproofing					0.00
07 11 00	Damp-proofing					0.00
07 12 00	Built-Up Bituminous Waterproofing					0.00
07 13 00	Sheet Waterproofing					0.00
07 14 00	Fluid-Applied Waterproofing					0.00
07 15 00	Sheet Metal Waterproofing					0.00
07 16 00	Cementitious & Reactive Waterproofing					0.00
07 17 00	Bentonite Waterproofing					0.00
07 18 00	Traffic Coatings					0.00
07 19 00	Water Repellents					0.00
07 20 00	Thermal Protection					0.00
07 21 00	Thermal Insulation					0.00
07 22 00	Roof & Deck Insulation					0.00
07 24 00	Exterior Insulation & Finish Systems					0.00
07 25 00	Weather Barriers					0.00
07 26 00	Vapor Retarders					0.00
07 27 00	Air Barriers					0.00
07 30 00	Steep Slope Roofing					0.00
07 31 00	Shingles & Shakes					0.00
07 32 00	Roof Tiles					0.00
07 33 00	Natural Roof Coverings					0.00
07 40 00	Roofing & Siding Panels					0.00
07 41 00	Roof Panels					0.00
07 42 00	Wall Panels					0.00
07 44 00	Faced Panels					0.00
07 46 00	Siding					0.00
07 50 00	Membrane Roofing					0.00
07 51 00	Built-Up Bituminous Roofing					0.00
07 52 00	Modified Bituminous Membrane Roofing					0.00
07 53 00	Elastomeric Membrane Roofing					0.00
07 54 00	Thermoplastic Membrane Roofing					0.00
07 55 00	Protected Membrane Roofing					0.00
07 56 00	Fluid-Applied Roofing					0.00
07 57 00	Coated Foamed Roofing					0.00
07 58 00	Roll Roofing					0.00
07 60 00	Flashing & Sheet Metal					0.00
07 61 00	Sheet Metal Roofing					0.00
07 62 00	Sheet Metal Flashing & Trim					0.00
07 63 00	Sheet Metal Roofing Specialties					0.00
07 64 00	Sheet Metal Wall Cladding					0.00
07 65 00	Flexible Flashing					0.00
07 70 00	Roof & Wall Specialties & Accessories					0.00
07 71 00	Roof Specialties					0.00
07 72 00	Roof Accessories					0.00
07 76 00	Roof Pavers					0.00
07 77 00	Wall Specialties					0.00
07 80 00	Fire & Smoke Protection					0.00
07 81 00	Applied Fireproofing					0.00
07 82 00	Board Fireproofing					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
07 84 00	Fire stopping					0.00
07 86 00	Smoke Seals					0.00
07 87 00	Smoke Containment Barriers					0.00
07 90 00	Joint Protection					0.00
07 91 00	Preformed Joint Seals					0.00
07 92 00	Joint Sealants					0.00
07 95 00	Expansion Control					0.00
	Other					0.00
	TOTAL THERMAL & MOISTURE PROTECTION	0.00		0.00	0.00	0.00
08 00 00	OPENINGS					
08 01 00	Operation & Maintenance of Openings					0.00
08 05 00	Common Work Results for Openings					0.00
08 06 00	Schedules for Openings					0.00
08 08 00	Commissioning of Openings					0.00
08 10 00	Doors & Frames					0.00
08 11 00	Metal Doors & Frames					0.00
08 12 00	Metal Frames					0.00
08 13 00	Metal Doors & Frames					0.00
08 14 00	Wood Doors					0.00
08 15 00	Plastic doors					0.00
08 16 00	Composite Doors					0.00
08 17 00	Integrated Door Opening Assemblies					0.00
08 30 00	Specialty Doors & Frames					0.00
08 31 00	Access Doors & Panels					0.00
08 32 00	Sliding Glass Doors					0.00
08 33 00	Coiling Doors & Grilles					0.00
08 34 00	Special Function Doors					0.00
08 35 00	Folding Doors & Grilles					0.00
08 36 00	Panel Doors					0.00
08 38 00	Panel Doors					0.00
08 39 00	Pressure-Resistant Doors					0.00
08 40 00	Entrances, Storefronts, & Curtain Walls					0.00
08 41 00	Entrances & Storefronts					0.00
08 42 00	Entrances					0.00
08 43 00	Storefronts					0.00
08 44 00	Curtain Wall & Glazed Assemblies					0.00
08 45 00	Translucent Wall & Roof Assemblies					0.00
08 50 00	Windows					0.00
08 51 00	Metal Windows					0.00
08 52 00	Wood Windows					0.00
08 53 00	Plastic Windows					0.00
08 54 00	Composite Windows					0.00
08 55 00	Pressure-Resistant Windows					0.00
08 56 00	Special Function Windows					0.00
08 60 00	Roof Windows & Skylights					0.00
08 61 00	Roof Windows					0.00
08 62 00	Unit Skylights					0.00
08 63 00	Metal-Framed Skylights					0.00
08 64 00	Plastic-Framed Skylights					0.00
08 67 00	Skylight Protection & Screens					0.00
08 70 00	Hardware					0.00
08 71 00	Door Hardware					0.00
08 74 00	Access Control Hardware					0.00
08 75 00	Window Hardware					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
08 78 00	Special Function Hardware					0.00
08 79 00	Hardware Accessories					0.00
08 80 00	Glazing					0.00
08 81 00	Glass Glazing					0.00
08 83 00	Mirrors					0.00
08 84 00	Plastic Glazing					0.00
08 85 00	Glazing Accessories					0.00
08 87 00	Glazing Surface Films					0.00
08 88 00	Special Function Glazing					0.00
08 90 00	Louvers & Vents					0.00
08 91 00	Louvers					0.00
08 92 00	Louvered Equipment Enclosures					0.00
08 95 00	Vents					0.00
	Other					0.00
	TOTAL OPENINGS	0.00		0.00	0.00	0.00
09 00 00	FINISHES					
09 01 00	Maintenance of Finishes					0.00
09 05 00	Common Work Results for Finishes					0.00
09 06 00	Schedules for Finishes					0.00
09 06 00.13	Room Finish Schedule					0.00
09 08 00	Commissioning of Finishes					0.00
09 20 00	Plaster & Gypsum Board					0.00
09 21 00	Plaster & Gypsum Board Assemblies					0.00
09 22 00	Supports for Plaster & Gypsum Board					0.00
09 23 00	Gypsum Plastering					0.00
09 24 00	Cement Plastering					0.00
09 25 00	Other Plastering					0.00
09 26 00	Veneer Plastering					0.00
09 27 00	Plaster Fabrications					0.00
09 28 00	Backing Boards & Underlayments					0.00
09 29 00	Gypsum Board					0.00
09 30 00	Tiling					0.00
09 31 00	Thin-Set Tiling					0.00
09 32 00	Mortar-Bed Tiling					0.00
09 33 00	Conductive Tiling					0.00
09 34 00	Waterproofing-Membrane Tiling					0.00
09 35 00	Chemical-Resistant Tiling					0.00
09 50 00	Ceilings					0.00
09 51 00	Acoustical Ceilings					0.00
09 53 00	Acoustical Ceiling Suspension Assemblies					0.00
09 54 00	Specialty Ceilings					0.00
09 56 00	Textured Ceilings					0.00
09 57 00	Special Function Ceilings					0.00
09 58 00	Integrated Ceiling Assemblies					0.00
09 60 00	Flooring					0.00
09 61 00	Flooring Treatment					0.00
09 62 00	Specialty Flooring					0.00
09 63 00	Masonry Flooring					0.00
09 64 00	Wood Flooring					0.00
09 65 00	Resilient Flooring					0.00
09 66 00	Terrazzo Flooring					0.00
09 67 00	Fluid-Applied Flooring					0.00
09 68 00	Carpeting					0.00
09 69 00	Access Flooring					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
09 70 00	Wall Finishings					0.00
09 72 00	Wall Coverings					0.00
09 73 00	Wall Carpeting					0.00
09 74 00	Flexible Wood Sheets					0.00
09 75 00	Stone Facing					0.00
09 76 00	Plastic Blocks					0.00
09 77 00	Special Wall Surfacing					0.00
09 78 00	Interior Wall Paneling					0.00
09 80 00	Acoustic Treatment					0.00
09 81 00	Acoustic Insulation					0.00
09 83 00	Acoustic Finishes					0.00
09 84 00	Acoustic Room Components					0.00
09 90 00	Painting & Coating					0.00
09 91 00	Painting					0.00
09 93 00	Staining & Transparent Finishing					0.00
09 94 00	Decorative Finishing					0.00
09 96 00	High-Performance Coatings					0.00
09 97 00	Special Coatings					0.00
	Other					0.00
	TOTAL FINISHES	0.00		0.00	0.00	0.00
10 00 00	SPECIALTIES					
10 01 00	Operation & Maintenance of Specialties					0.00
10 05 00	Common Work Results for Specialties					0.00
10 06 00	Schedules for Specialties					0.00
10 08 00	Commissioning of Specialties					0.00
10 10 00	Information & Specialties					0.00
10 11 00	Visual Display Units					0.00
10 12 00	Display Cases					0.00
10 13 00	Directories					0.00
10 14 00	Signage					0.00
10 17 00	Telephone Specialties					0.00
10 18 00	Informational Kiosks					0.00
10 20 00	Interior Specialties					0.00
10 21 00	Compartments & Cubicles					0.00
10 22 00	Partitions					0.00
10 25 00	Service Walls					0.00
10 26 00	Wall & Door Protection					0.00
10 28 00	Toilet, Bath & Laundry Accessories					0.00
10 30 00	Fireplaces & Stoves					0.00
10 31 00	Manufactured Fireplaces					0.00
10 32 00	Fireplace Specialties					0.00
10 35 00	Stoves					0.00
10 40 00	Safety Specialties					0.00
10 41 00	Emergency Access & Information Cabinets					0.00
10 43 00	Emergency Aid Specialties					0.00
10 44 00	Fire Protection Specialties					0.00
10 50 00	Storage Specialties					0.00
10 51 00	Lockers					0.00
10 55 00	Postal Specialties					0.00
10 56 00	Storage Assemblies					0.00
10 57 00	Wardrobe & Closet Specialties					0.00
10 70 00	Exterior Specialties					0.00
10 71 00	Exterior Protection					0.00
10 73 00	Protective Covers					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
10 74 00	Manufactured Exterior Specialties					0.00
10 75 00	Flagpoles					0.00
10 80 00	Other Specialties					0.00
10 81 00	Pest Control Devices					0.00
10 82 00	Grilles & Screens					0.00
10 83 00	Flags & Banners					0.00
10 84 00	Gas Lighting					0.00
10 86 00	Security Mirrors & Domes					0.00
10 88 00	Scales					0.00
	TOTAL SPECIALTIES	0.00		0.00	0.00	0.00
11 00 00	EQUIPMENT					
11 01 00	Operation & Maintenance of Equipment					0.00
11 05 00	Common Work Results for Equipment					0.00
11 06 00	Schedules for Equipment					0.00
11 08 00	Commissioning of Equipment					0.00
11 10 00	Vehicle & Pedestrian Equipment					0.00
11 11 00	Vehicle Service Equipment					0.00
11 12 00	Parking Control Equipment					0.00
11 13 00	Loading Dock Equipment					0.00
11 13 00	Pedestrian Control Equipment					0.00
11 15 00	Security, Detention & Banking Equipment					0.00
11 16 00	Vault Equipment					0.00
11 17 00	Teller & Service Equipment					0.00
11 18 00	Security Equipment					0.00
11 19 00	Detention Equipment					0.00
11 20 00	Commercial Equipment					0.00
11 21 00	Mercantile & Service Equipment					0.00
11 22 00	Refrigerated Display Equipment					0.00
11 23 00	Commercial Laundry & Dry Cleaning Equipment					0.00
11 24 00	Maintenance Equipment					0.00
11 25 00	Hospitality Equipment					0.00
11 26 00	Unit Kitchens					0.00
11 27 00	Photographic Processing Equipment					0.00
11 28 00	Office Equipment					0.00
11 29 00	Postal, Packaging, & Shipping Equipment					0.00
11 30 00	Residential Equipment					0.00
11 31 00	Residential Appliances					0.00
11 33 00	Retractable Stairs					0.00
11 34 00	Residential Ceiling Fans					0.00
11 40 00	Foodservice Equipment					0.00
11 41 00	Foodservice Storage Equipment					0.00
11 42 00	Food Preparation Equipment					0.00
11 43 00	Food Delivery Carts & Conveyors					0.00
11 44 00	Food Cooking Equipment					0.00
11 46 00	Food Dispensing Equipment					0.00
11 47 00	Ice Machines					0.00
11 48 00	Cleaning & Disposal Equipment					0.00
11 50 00	Educational & Scientific Equipment					0.00
11 51 00	Library Equipment					0.00
11 52 00	Audio-Visual Equipment					0.00
11 53 00	Laboratory Equipment					0.00
11 55 00	Planetarium Equipment					0.00
11 56 00	Observatory Equipment					0.00
11 57 00	Vocational Shop Equipment					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
11 59 00	Exhibit Equipment					0.00
11 60 00	Entertainment Equipment					0.00
11 61 00	Broadcast, Theater & Stage Equipment					0.00
11 62 00	Musical Equipment					0.00
11 65 00	Athletic & Recreational Equipment					0.00
11 66 00	Athletic Equipment					0.00
11 67 00	Recreational Equipment					0.00
11 68 00	Play Field Equipment & Structures					0.00
11 70 00	Healthcare Equipment					0.00
11 71 00	Medical Sterilizing Equipment					0.00
11 72 00	Examination & Treatment Equipment					0.00
11 73 00	Patient Care Equipment					0.00
11 74 00	Dental Equipment					0.00
11 75 00	Optical Equipment					0.00
11 76 00	Operating Room Equipment					0.00
11 77 00	Radiology Equipment					0.00
11 78 00	Mortuary Equipment					0.00
11 79 00	Therapy Equipment					0.00
11 80 00	Collection & Disposal Equipment					0.00
11 82 00	Solid Waste Handling Equipment					0.00
11 90 00	Other Equipment					0.00
11 91 00	Religious Equipment					0.00
11 95 00	Arts & Crafts Equipment					0.00
	TOTAL EQUIPMENT	0.00		0.00	0.00	0.00
12 00 00	FURNISHINGS					
12 01 00	Operation & Maintenance of Furnishings					0.00
12 05 00	Common Work Results for Furnishings					0.00
12 06 00	Schedules for Furnishings					0.00
12 08 00	Commissioning of Furnishings					0.00
12 10 00	Art					0.00
12 11 00	Murals					0.00
12 12 00	Wall Decorations					0.00
12 14 00	Sculptures					0.00
12 17 00	Art Glass					0.00
12 19 00	Religious Art					0.00
12 20 00	Window Treatments					0.00
12 21 00	Window Blinds					0.00
12 22 00	Curtains & Drapes					0.00
12 23 00	Interior Shutters					0.00
12 24 00	Window Shades					0.00
12 25 00	Window Treatment Operating Hardware					0.00
12 26 00	Interior Daylighting Devices					0.00
12 30 00	Casework					0.00
12 31 00	Manufactured Metal Casework					0.00
12 32 00	Manufactured Wood Casework					0.00
12 34 00	Manufactured Plastic Casework					0.00
12 35 00	Specialty Casework					0.00
12 36 00	Countertops					0.00
12 40 00	Furnishings & Accessories					0.00
12 41 00	Office Accessories					0.00
12 42 00	Table Accessories					0.00
12 43 00	Portable Lamps					0.00
12 44 00	Bath Furnishings					0.00
12 45 00	Bedroom Furnishings					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

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LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
12 46 00	Furnishing Accessories					0.00
12 48 00	Rugs & Mats					0.00
12 50 00	Furniture					0.00
12 51 00	Office Furniture					0.00
12 52 00	Seating					0.00
12 53 00	Retail Furniture					0.00
12 54 00	Hospitality Furniture					0.00
12 55 00	Detention Furniture					0.00
12 56 00	Institutional Furniture					0.00
12 57 00	Industrial Furniture					0.00
12 59 00	Systems Furniture					0.00
12 60 00	Multiple Seating					0.00
12 61 00	Fixed Audience Seating					0.00
12 62 00	Portable Audience Seating					0.00
12 63 00	Stadium & Arena Seating					0.00
12 64 00	Booths & Tables					0.00
12 65 00	Multiple-Use Fixed Seating					0.00
12 66 00	Telescoping Stands					0.00
12 67 00	Pews & Benches					0.00
12 68 00	Seat & Table Accessories					0.00
12 90 00	Other Furnishings					0.00
12 91 00	Interior Planters & Artificial Plants					0.00
12 93 00	Site Furnishings					0.00
	Other					0.00
	TOTAL FURNISHINGS	0.00		0.00	0.00	0.00
13 00 00	SPECIAL CONSTRUCTION					
13 20 00	Special Purpose Rooms					0.00
13 21 00	Controlled Environment Rooms					0.00
13 22 00	Office Shelters & Booths					0.00
13 23 00	Planetariums					0.00
13 24 00	Special Activity Rooms					0.00
13 36 00	Fabricated Rooms					0.00
13 37 00	Vaults					0.00
13 28 00	Athletic & Recreational Special Construction					0.00
13 30 00	Special Structures					0.00
13 31 00	Fabric Structures					0.00
13 32 00	Space Frames					0.00
13 34 00	Fabricated Engineered Structures					0.00
13 35 00	Rammed Earth Construction					0.00
13 36 00	Towers					0.00
	Other					0.00
	TOTAL SPECIAL CONSTRUCTION	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
14 00 00	CONVEYING EQUIPMENT					
14 01 00	Operation & Maintenance of Conveying Equipment					0.00
14 05 00	Common Work Results for Conveying Equipment					0.00
14 06 00	Schedules for Conveying Equipment					0.00
14 08 00	Commissioning of Conveying Equipment					0.00
14 10 00	Dumbwaiters					0.00
14 11 00	Manual Dumbwaiters					0.00
14 12 00	Electric Dumbwaiters					0.00
14 14 00	Hydraulic Dumbwaiters					0.00
14 20 00	Elevators					0.00
14 21 00	Electric Traction Elevators					0.00
14 24 00	Hydraulic Elevators					0.00
14 26 00	Limited-Use/Limited-Application Elevators					0.00
14 27 00	Custom Elevator Cabs & Doors					0.00
14 28 00	Elevator Equipment & Controls					0.00
14 30 00	Escalators & Moving Walks					0.00
14 31 00	Escalators					0.00
14 32 00	Moving Walks					0.00
14 33 00	Moving Ramps					0.00
14 40 00	Lifts					0.00
14 41 00	People Lifts					0.00
14 42 00	Wheelchair Lifts					0.00
14 43 00	Platform Lifts					0.00
14 44 00	Sidewalk Lifts					0.00
14 45 00	Vehicle Lifts					0.00
14 70 00	Turntables					0.00
14 71 00	Industrial Turntables					0.00
14 72 00	Hospitality Turntables					0.00
14 73 00	Exhibit Turntables					0.00
14 74 00	Entertainment Turntables					0.00
14 80 00	Scaffolding					0.00
14 81 00	Suspended Scaffolding					0.00
14 82 00	Rope Climbers					0.00
14 83 00	Elevating Platforms					0.00
14 84 00	Powered Scaffolding					0.00
14 90 00	Other Conveying Equipment					0.00
14 91 00	Facility Chutes					0.00
14 92 00	Pneumatic Tube Systems					0.00
14 93 00	Slide Pole Systems					0.00
	Other					0.00
	TOTAL CONVEYING EQUIPMENT	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
21 00 00	FIRE SUPPRESSION					
21 01 00	Operation & Maintenance of Fire Suppression					0.00
21 05 00	Common Work Results for Fire Suppression					0.00
21 06 00	Schedules for Fire Suppression					0.00
21 07 00	Fire Suppression Systems Insulation					0.00
21 08 00	Commissioning of Fire Suppression					0.00
21 09 00	Instrumentation & Control for Fire-Suppression Systems					0.00
21 10 00	Water-Based Fire-Suppression Systems					0.00
21 11 00	Facility Fire-Suppression Water-Service Piping					0.00
21 12 00	Fire-Suppression Standpipes					0.00
21 13 00	Fire-Suppression Sprinkler Systems					0.00
21 16 00	Fire-Suppression Pressure Maintenance Pumps					0.00
21 20 00	Fire-Extinguishing Systems					0.00
21 21 00	Carbon-Dioxide Fire-Extinguishing Systems					0.00
21 22 00	Clean-Agent Fire-Extinguishing Systems					0.00
21 23 00	Wet-Chemical Fire-Extinguishing Systems					0.00
21 24 00	Dry-Chemical Fire-Extinguishing Systems					0.00
21 30 00	Fire Pumps					0.00
21 31 00	Centrifugal Fire Pumps					0.00
21 32 00	Vertical-Turbine Fire Pumps					0.00
21 33 00	Positive-Displacement Fire Pumps					0.00
21 40 00	Fire-Suppression Water Storage					0.00
21 41 00	Storage Tanks for Fire-Suppression Water					0.00
	Other					0.00
	TOTAL FIRE SUPPRESSION	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
22 00 00	PLUMBING					
22 01 00	Operation & Maintenance of Plumbing					0.00
22 05 00	Common Work Results for Plumbing					0.00
22 06 00	Schedules for Plumbing					0.00
22 07 00	Plumbing Insulation					0.00
22 08 00	Commissioning of Plumbing					0.00
22 09 00	Instrumentation & Control of Plumbing					0.00
22 10 00	Plumbing Piping					0.00
22 11 00	Facility Water Distribution					0.00
22 12 00	Facility Potable-Water Storage Tanks					0.00
22 13 00	Facility Sanitary Sewerage					0.00
22 14 00	Facility Storm Drainage					0.00
22 15 00	General Service Compressed-Air Systems					0.00
22 30 00	Plumbing Equipment					0.00
22 31 00	Domestic Water Softeners					0.00
22 32 00	Domestic Water Filtration Equipment					0.00
22 33 00	Electric Domestic Water Heaters					0.00
22 34 00	Fuel-Fired Domestic Water Heaters					0.00
22 35 00	Domestic Water Heat Exchangers					0.00
22 40 00	Plumbing Fixtures					0.00
22 41 00	Residential Plumbing Fixtures					0.00
22 42 00	Commercial Plumbing Fixtures					0.00
22 43 00	Healthcare Plumbing Fixtures					0.00
22 45 00	Emergency Plumbing Fixtures					0.00
22 46 00	Security Plumbing Fixtures					0.00
22 47 00	Drinking Fountains & Water Coolers					0.00
22 60 00	Gas & Vacuum Systems for Lab & Healthcare Facilities					0.00
22 61 00	Compressed Air Systems for Lab & Healthcare Facilities					0.00
22 62 00	Vacuum Systems for Laboratory & Healthcare Systems					0.00
22 63 00	Gas Systems for Laboratory & Healthcare Systems					0.00
22 66 00	Chemical-Waste Systems for Lab & Healthcare Facilities					0.00
22 67 00	Processed Water Systems for Lab & Healthcare Facilities					0.00
	Other					0.00
	TOTAL PLUMBING	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

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C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
23 00 00	Heating, Ventilating & Air Conditioning (HVAC)					
23 01 00	Operation & Maintenance of HVAC Systems					0.00
23 05 00	Common Work Results for HVAC					0.00
23 06 00	Schedules for HVAC					0.00
23 07 00	HVAC Insulation					0.00
23 08 00	Commissioning of HVAC					0.00
23 09 00	Instrumentation & Control of HVAC					0.00
23 10 00	Facility Fuel Systems					0.00
23 11 00	Facility Fuel Piping					0.00
23 12 00	Facility Fuel Pumps					0.00
23 13 00	Facility Fuel-Storage Tanks					0.00
23 20 00	HVAC Piping & Pumps					0.00
23 21 00	Hydronic Piping & Pumps					0.00
23 22 00	Steam & Condensate Piping & Pumps					0.00
23 23 00	Refrigerant Piping					0.00
23 24 00	Internal-Combustion Engine Piping					0.00
23 25 00	HVAC Water Treatment					0.00
23 30 00	HVAC Air Distribution					0.00
23 31 00	HVAC Ducts & Casings					0.00
23 32 00	Air Plenums & Chases					0.00
23 33 00	Air Duct Accessories					0.00
23 34 00	HVAC Fans					0.00
23 35 00	Special Exhaust Systems					0.00
23 36 00	Air Terminal Units					0.00
23 27 00	Air Outlets & Inlets					0.00
23 38 00	Ventilation Hoods					0.00
23 40 00	HVAC Air Cleaning Devices					0.00
23 41 00	Particulate Air Filtration					0.00
23 42 00	Gas-Phase Air Filtration					0.00
23 43 00	Electronic Air Cleaners					0.00
23 50 00	Central Heating Equipment					0.00
23 51 00	Breechings, Chimneys & Stacks					0.00
23 52 00	Heating Boilers					0.00
23 53 00	Heating Boiler Feedwater Equipment					0.00
23 54 00	Furnaces					0.00
23 55 00	Fuel-Fired Heaters					0.00
23 56 00	Solar Energy Heating Equipment					0.00
23 57 00	Heat Exchangers for HVAC					0.00
23 60 00	Central Cooling Equipment					0.00
23 61 00	Refrigerant Compressors					0.00
23 62 00	Packaged Compressor & Condenser Units					0.00
23 63 00	Refrigerant Condensers					0.00
23 64 00	Packaged Water Chillers					0.00
23 65 00	Cooling Towers					0.00
23 70 00	Central HVAC Equipment					0.00
23 71 00	Thermal Storage					0.00
23 72 00	Air-to-Air Energy Recovery Equipment					0.00
23 73 00	Indoor Central-Station Air-Handling Units					0.00
23 74 00	Packaged Outdoor HVAC Equipment					0.00
23 75 00	Custom-Packaged Outdoor HVAC Equipment					0.00
23 76 00	Evaporative Air-Cooling Equipment					0.00
23 80 00	Decentralized HVAC Equipment					0.00
23 81 00	Decentralized Unitary HVAC Equipment					0.00
23 82 00	Convection Heating & Cooling Units					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
23 83 00	Radiant Heating Units					0.00
23 84 00	Humidity Control Equipment					0.00
	Other					0.00
	TOTAL HVAC	0.00		0.00	0.00	0.00
25 00 00	INTEGRATED AUTOMATION					
25 01 00	Operation & Maintenance of Integrated Automation					0.00
25 05 00	Common Work Results for Integrated Automation					0.00
25 06 00	Schedules for Integrated Automation					0.00
25 08 00	Commissioning of Integrated Automation					0.00
25 10 00	Integrated Automation Network Equipment					0.00
25 11 00	Integrated Automation Network Devices					0.00
25 12 00	Integrated Automation Network Gateways					0.00
25 13 00	Integrated Automation Control & Monitoring Network					0.00
25 14 00	Integrated Automation Local Control Units					0.00
25 15 00	Integrated Automation Software					0.00
25 30 00	Integrated Automation Instrumentation & Terminal Devices					0.00
25 31 00	Integrated Automation Instrumentation & Terminal Devices for Facility Equipment					0.00
25 32 00	Integrated Automation Instrumentation & Terminal Devices for Conveying Equipment					0.00
25 33 00	Integrated Automation Instrumentation & Terminal Devices for Fire-Suppression Systems					0.00
25 34 00	Integrated Automation Instrumentation & Terminal Devices for Plumbing					0.00
25 35 00	Integrated Automation Instrumentation & Terminal Devices for HVAC					0.00
25 36 00	Integrated Automation Instrumentation & Terminal Devices for Electrical Systems					0.00
25 37 00	Integrated Automation Instrumentation & Terminal Devices for Communications Systems					0.00
25 38 00	Integrated Automation Instrumentation & Terminal Devices for Electronic Safety & Security Systems					0.00
25 50 00	Integrated Automation Facility Controls					0.00
25 51 00	Integrated Automation Control of Facility Equipment					0.00
25 52 00	Integrated Automation Control of Conveying Equipment					0.00
25 53 00	Integrated Automation Control of Fire-Suppression Systems					0.00
25 54 00	Integrated Automation Control of Plumbing					0.00
25 55 00	Integrated Automation Control of HVAC					0.00
25 56 00	Integrated Automation Control of Electrical Systems					0.00
25 57 00	Integrated Automation Control of Communications Systems					0.00
25 58 00	Integrated Automation Control of Electronic Safety & Security Systems					0.00
25 90 00	Integrated Automation Control Sequences					0.00
25 91 00	Integrated Automation Control Sequences for Facility Equipment					0.00
25 92 00	Integrated Automation Control Sequences for Conveying Equipment					0.00
25 93 00	Integrated Automation Control Sequences for Fire-Suppression Systems					0.00
25 94 00	Integrated Automation Control Sequences for Plumbing					0.00
25 95 00	Integrated Automation Control Sequences for HVAC					0.00
25 96 00	Integrated Automation Control Sequences for Electrical Systems					0.00
25 97 00	Integrated Automation Control Sequences for Communications Systems					0.00
25 98 00	Integrated Automation Control Sequences for Electronic Safety & Security Systems					0.00
	Other					0.00
	TOTAL INTEGRATED AUTOMATION	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
26 00 00	ELECTRICAL					
26 01 00	Operation & Maintenance of Electrical Systems					0.00
26 05 00	Common Work Results for Electrical					0.00
26 06 00	Schedules for Electrical					0.00
26 08 00	Commissioning of Electrical Systems					0.00
26 09 00	Instrumentation & Control for Electrical Systems					0.00
26 10 00	Medium-Voltage Electrical Distribution					0.00
26 11 00	Substations					0.00
26 12 00	Medium-Voltage Transformers					0.00
26 13 00	Medium-Voltage Switchgear					0.00
26 16 00	Medium-Voltage Metering					0.00
26 18 00	Medium-Voltage Circuit Protection Devices					0.00
26 20 00	Low-Voltage Electrical Transmission					0.00
26 21 00	Low-Voltage Electrical Service Entrance					0.00
26 22 00	Low-Voltage Transformers					0.00
26 23 00	Low-Voltage Switchgear					0.00
26 24 00	Switchboards & Panelboards					0.00
26 25 00	Enclosed Bus Assemblies					0.00
26 26 00	Power Distribution Units					0.00
26 27 00	Low-Voltage Distribution Equipment					0.00
26 28 00	Low-Voltage Circuit Protective Devices					0.00
26 29 00	Low-Voltage Controllers					0.00
26 30 00	Facility Electrical Power Generating & Storing Equipment					0.00
26 31 00	Photovoltaic Collectors					0.00
26 32 00	Packaged Generator Assemblies					0.00
26 33 00	Battery Equipment					0.00
26 35 00	Power Filters & Conditioners					0.00
26 36 00	Transfer Switches					0.00
26 40 00	Electrical & Cathodic Protection					0.00
26 41 00	Facility Lightning Protection					0.00
26 42 00	Cathodic Protection					0.00
26 43 00	Surge Protective Devices					0.00
26 50 00	Lighting					0.00
26 51 00	Interior Lighting					0.00
26 52 00	Emergency Lighting					0.00
26 53 00	Exit Signs					0.00
26 54 00	Classified Location Lighting					0.00
26 55 00	Special Purpose Lighting					0.00
26 56 00	Exterior Lighting					0.00
	Other					0.00
	TOTAL ELECTRICAL	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
27 00 00	COMMUNICATIONS					
27 01 00	Operation & Maintenance of Communications Systems					0.00
27 05 00	Common Work Results for Communications					0.00
27 06 00	Schedules for Communications					0.00
27 08 00	Commissioning for Communications					0.00
27 10 00	Structure Cabling					0.00
27 11 00	Communications Equipment Room Fittings					0.00
27 13 00	Communications Backbone Cabling					0.00
27 15 00	Communications Horizontal Cabling					0.00
27 15 00.16	Voice Communications Horizontal Cabling					0.00
27 15 00.19	Data Communications Horizontal Cabling					0.00
27 15 00.23	Audio-Video Communications Horizontal Cabling					0.00
27 15 00.39	Patient Monitoring & Telemetry Communications					0.00
27 15 00.43	Nurse Call & Intercom Communications Horizontal Cabling					0.00
27 15 00.46	Paging Communications Horizontal Cabling					0.00
27 15 00.49	Intermediate Frequency/Radio Frequency					0.00
27 15 00.53	Antennas Communications Horizontal Cabling					0.00
27 16 00	Communications Connecting Cords, Devices & Adapters					0.00
27 20 00	Data Communications					0.00
27 21 00	Data Communications Network Equipment					0.00
27 22 00	Data Communication Hardware					0.00
27 24 00	Data Communications Peripheral Data Equipment					0.00
27 25 00	Data Communications Software					0.00
27 26 00	Data Communications Programming & Integration Services					0.00
27 30 00	Voice Communications					0.00
27 31 00	Voice Communications Switching & Routing Equipment					0.00
27 32 00	Voice Communications Terminal Equipment					0.00
27 33 00	Voice Communications Messaging					0.00
27 34 00	Call Accounting					0.00
27 35 00	Call Management					0.00
27 40 00	Audio-Video Communications					0.00
27 41 00	Audio-Video Systems					0.00
27 42 00	Electronic Digital Systems					0.00
27 50 00	Distributed Communications & Monitoring Systems					0.00
27 51 00	Distributed Audio-Video Communications Systems					0.00
27 52 00	Healthcare Communications & Monitoring Systems					0.00
27 53 00	Distributed Systems					0.00
	Other					0.00
	TOTAL COMMUNICATIONS	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

IAC/PSCP FORM 306.4

PAGE 26 OF 31

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
28 00 00	ELECTRONIC SAFETY & SECURITY					
28 01 00	Operation & Maintenance of Electronic Safety & Security					0.00
28 05 00	Common Work Results for Electronic Safety & Security					0.00
28 06 00	Schedules for Electronic Safety & Security					0.00
28 08 00	Commissioning of Electronic Safety & Security					0.00
28 10 00	Electronic Access Control & Intrusion Detection					0.00
28 13 00	Access Control					0.00
28 16 00	Intrusion Detection					0.00
28 20 00	Electronic Surveillance					0.00
28 23 00	Video Surveillance					0.00
28 26 00	Electronic Personal Protection Systems					0.00
28 30 00	Electronic Detection & Alarm					0.00
28 31 00	Fire Detection & Alarm					0.00
28 32 00	Radiation Detection & Alarm					0.00
28 33 00	Gas Detection & Alarm					0.00
28 34 00	Fuel-Oil Detection & Alarm					0.00
28 35 00	Refrigerant Detection & Alarm					0.00
28 36 00	Water Detection & Alarm					0.00
28 39 00	Mass Notification Systems					0.00
	Other					0.00
	TOTAL ELECTRONIC SAFETY & SECURITY	0.00		0.00	0.00	0.00
31 00 00	EARTHWORK					
31 01 00	Maintenance of Earthwork					0.00
31 05 00	Common Work Results for Earthwork					0.00
31 06 00	Schedules for Earthwork					0.00
31 08 00	Commissioning of Earthwork					0.00
31 09 00	Geotechnical Instrumentation & Monitoring of Earthwork					0.00
31 10 00	Site Clearing					0.00
31 11 00	Clearing & Grubbing					0.00
31 12 00	Selective Clearing					0.00
31 13 00	Selective Tree & Shrub Removal & Trimming					0.00
31 14 00	Earth Stripping & Stockpiling					0.00
31 20 00	Earth Moving					0.00
31 21 00	Off-Gassing Mitigation					0.00
31 22 00	Grading					0.00
31 23 00	Excavation & Fill					0.00
31 24 00	Embankments					0.00
31 25 00	Erosion & Sedimentation Controls					0.00
31 30 00	Earthwork Methods					0.00
31 31 00	Soil Treatment					0.00
31 32 00	Soil Stabilization					0.00
31 33 00	Rock Stabilization					0.00
31 34 00	Soil Reinforcement					0.00
31 35 00	Slope Protection					0.00
31 36 00	Gabions					0.00
31 37 00	Riprap					0.00
31 40 00	Shoring & Underpinning					0.00
31 41 00	Shoring & Underpinning					0.00
31 43 00	Concrete Raising					0.00
31 45 00	Vibroflotation & Densification					0.00
31 46 00	Needle Beams					0.00
31 48 00	Underpinning					0.00
31 50 00	Excavation Support & Protection					0.00
31 51 00	Anchor Tiebacks					0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
31 53 00	Cribbing & Walkers					0.00
31 60 00	Special Foundations & Load-Bearing Elements					0.00
31 62 00	Driven Piles					0.00
31 63 00	Bored Piles					0.00
31 64 00	Caissons					0.00
31 66 00	Special Foundations					0.00
31 68 00	Foundation Anchors					0.00
	Other					0.00
	TOTAL EARTHWORK	0.00		0.00	0.00	0.00
32 00 00	EXTERIOR IMPROVEMENTS					
32 01 00	Operation & Maintenance of Exterior Improvements					0.00
32 05 00	Common Work Results for Exterior Improvements					0.00
32 06 00	Schedules for Exterior Improvements					0.00
32 08 00	Commissioning of Exterior Improvements					0.00
32 10 00	Bases, Ballasts, & Paving					0.00
32 11 00	Base Courses					0.00
32 12 00	Flexible Paving					0.00
32 13 00	Rigid Paving					0.00
32 14 00	Unit Paving					0.00
32 15 00	Aggregate Surfacing					0.00
32 16 00	Curbs, Gutters, Sidewalks, & Driveways					0.00
32 17 00	Paving Specialties					0.00
32 18 00	Athletic & Recreational Surfacing					0.00
32 30 00	Site Improvements					0.00
32 31 00	Fences & Gates					0.00
32 32 00	Retaining Walls					0.00
32 35 00	Screening Devices					0.00
32 39 00	Manufactured Site Specialties					0.00
32 80 00	Irrigation					0.00
32 82 00	Irrigation Pumps					0.00
32 84 00	Planting Irrigation					0.00
32 90 00	Planting					0.00
32 91 00	Planting Preparation					0.00
32 92 00	Turf & Grasses					0.00
32 93 00	Plants					0.00
32 94 00	Planting Accessories					0.00
32 95 00	Exterior Planting Support Structures					0.00
32 96 00	Transplanting					0.00
	Other					0.00
	TOTAL EXTERIOR IMPROVEMENTS	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
33 00 00	UTILITIES					
33 01 00	Operation & Maintenance of Utilities					0.00
33 05 00	Common Work Results for Utilities					0.00
33 06 00	Schedules for Utilities					0.00
33 08 00	Commissioning of Utilities					0.00
33 09 00	Instrumentation & Control for Utilities					0.00
33 10 00	Water Utilities					0.00
33 11 00	Water Utility Distribution Piping					0.00
33 12 00	Water Utility Distribution Equipment					0.00
33 13 00	Disinfecting of Water Utility Equipment					0.00
33 16 00	Water Utility Storage Tanks					0.00
33 20 00	Wells					0.00
33 21 00	Water Supply Wells					0.00
33 22 00	Test wells					0.00
33 23 00	Extraction Wells					0.00
33 24 00	Monitoring Wells					0.00
33 25 00	Recharge Wells					0.00
33 26 00	Relief Wells					0.00
33 29 00	Well Abandonment					0.00
33 30 00	Sanitary Sewerage Utilities					0.00
33 31 00	Sanitary Utility Sewerage Piping					0.00
33 33 00	Low Pressure Utility Sewerage					0.00
33 34 00	Sanitary Utility Sewerage Force Mains					0.00
33 39 00	Sanitary Utility Sewerage Structures					0.00
33 40 00	Storm Drainage Utilities					0.00
33 41 00	Storm Utility Drainage Piping					0.00
33 42 00	Culverts					0.00
33 44 00	Storm Utility Water Drains					0.00
33 45 00	Storm Utility Drainage Pumps					0.00
33 46 00	Sub-drainage					0.00
33 49 00	Storm Drainage Structures					0.00
33 60 00	Hydronic & Steam Energy Utilities					0.00
33 61 00	Hydronic Energy Distribution					0.00
33 63 00	Steam Energy Distribution					0.00
33 70 00	Electrical Utilities					0.00
33 71 00	Electrical Utility Transmission & Distribution					0.00
33 75 00	High-Voltage Switchgear & Protection Devices					0.00
33 77 00	Medium-Voltage Utility Switchgear & Protection Devices					0.00
33 79 00	Site Grounding					0.00
	Other					0.00
	TOTAL UTILITIES	0.00		0.00	0.00	0.00
34 00 00	TRANSPORTATION					
	Other					0.00
						0.00
	TOTAL TRANSPORTATION	0.00		0.00	0.00	0.00
35 00 00	WATERWAY & MARINE CONSTRUCTION					
	Other					0.00
						0.00
	TOTAL WATERWAY & MARINE CONSTRUCTION	0.00		0.00	0.00	0.00
40 00 00	PROCESS INTEGRATION					
	Other					0.00
						0.00
	TOTAL PROCESS INTEGRATION	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C.S.I.	CATEGORY	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
41 00 00	MATERIAL PROCESSING & HANDLING EQUIP					
	Other					0.00
						0.00
	TOTAL MATERIAL PROCESSING & HANDLING EQUIP	0.00		0.00	0.00	0.00
42 00 00	PROCESS HEATING, COOLING, & DRYING EQUIP					
	Other					0.00
						0.00
	TOTAL PROCESS HEATING, COOLING & DRYING EQUIP	0.00		0.00	0.00	0.00
43 00 00	PROCESS GAS & LIQUID HANDLING, PURIFICATION, & STORAGE					
	Other					0.00
						0.00
	TOTAL PROCESS GAS & LIQUID HANDLING, PURIFICATION, & STORAGE	0.00		0.00	0.00	0.00
44 00 00	POLLUTION & WASTE CONTROL EQUIP					
	Other					0.00
						0.00
	TOTAL POLLUTION & WASTE CONTROL EQUIP	0.00		0.00	0.00	0.00
45 00 00	INDUSTRY-SPECIFIC MANUFACTURING EQUIP					
	Other					0.00
						0.00
	TOTAL INDUSTRY-SPECIFIC MANUFACTURING EQUIP	0.00		0.00	0.00	0.00
46 00 00	WATER & WASTEWATER EQUIP					
	Other					0.00
						0.00
	TOTAL WATER & WASTEWATER EQUIP	0.00		0.00	0.00	0.00
48 00 00	ELECTRICAL POWER GENERATION					
	Other					0.00
						0.00
	TOTAL ELECTRICAL POWER GENERATION	0.00		0.00	0.00	0.00
	TOTAL	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

C/O Number	Brief Description	TOTAL COST	COMPLETED TO DATE		PRIOR REQUISITIONS	CURRENT PAYMENT DUE
			%	\$		
TOTAL (Enter on page 1)						

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: Baltimore County Public Schools DATE: _____

PROJECT TITLE: _____ PSC NO: _____

LOCATION: _____ REQ NO: _____

Material Stored on Site				
Item	Description	Cost	PRIOR REQUISITIONS	CURRENT PAYMENT
Total (Enter on page 1)				

Additional information to be filed with Initial and Final Submissions Only.

	COST
A. Foundations and Slab on Grade	\$
B. Structural System	\$
C. Exterior Walls	\$
D. Interior Partitions	\$
E. Ceilings	\$
F. Floor Finishes	\$
G. Lighting	\$

Site size in acres: _____
 Portion of site being developed in acres: _____
 Size of school in gross square feet: _____
 Construction start date: _____

SECTION 00610 - PERFORMANCE & PAYMENT BONDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contractors must use the attached AIA Document A312 – 2010 Performance Bond and Payment Bond format for submission of bonding information.
- B. Submit executed Performance Bond(s) and Payment Bond(s) upon notification of contract award.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00610

**Victory Villa Elementary School
Replacement School
PSCP #03.057.17 LP
ARA-209-17**

PERFORMANCE & PAYMENT BONDS

00610 - 1



AIA[®]

Document A312™ – 2010

Payment Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Board of Education of Baltimore County
6901 Charles Street
Towson, MD 21204

CONSTRUCTION CONTRACT

Date:

Amount: \$

Description:

(Name and location)

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond: None See Section 18

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name and

Title:

(Any additional signatures appear on the last page of this Payment Bond.)

Signature: _____

Name and

Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 **Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 **Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

SURETY

Company: _____ (Corporate Seal)

Company: _____ (Corporate Seal)

Signature: _____

Signature: _____

Name and Title:

Name and Title:

Address:

Address:

Init.



AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Board of Education of Baltimore County
6901 Charles Street
Towson, MD 21204

CONSTRUCTION CONTRACT

Date:

Amount: \$

Description:

(Name and location)

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond: None See Section 16

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name and

Title:

(Any additional signatures appear on the last page of this Performance Bond.)

Signature: _____

Name and

Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:**OWNER'S REPRESENTATIVE:**

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 **Balance of the Contract Price.** The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 **Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 **Contractor Default.** Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 **Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 **Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

SURETY

Company: _____
(Corporate Seal)

Company: _____
(Corporate Seal)

Signature: _____

Signature: _____

Name and Title: _____

Name and Title: _____

Address: _____

Address: _____

Init.

SECTION 00700 - GENERAL CONDITIONS

PART 1 - GENERAL

1.1 RELATED PRODUCTS

- A. AIA Document A201 - 1997 edition, as modified by the Owner, will be the form incorporated into each contract between the Owner and the Contractor. The General Conditions, including Supplementary Conditions herein, shall become a part of the Specification and shall apply to all Contractors and Subcontractors.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00700

 **AIA[®] Document A201[™] – 1997****General Conditions of the Contract for Construction****for the following PROJECT:***(Name and location or address):*

AS STATED ON THE COVER OF THESE SPECIFICATIONS

THE OWNER:*(Name and address):*BOARD OF EDUCATION OF BALTIMORE COUNTY
9610 PULASKI PARK DRIVE, SUITE 204
BALTIMORE, MARYLAND 21220**THE ARCHITECT:***(Name and address):*

AS STATED ON THE DRAWINGS FOR THIS CONTRACT

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document has been approved and endorsed by The Associated General Contractors of America

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Owner. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of Addenda relating to bidding requirements).

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. Except as set forth in Paragraph 5.3 and Paragraph 5.4, the Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Owner and a Subcontractor or Sub-subcontractor, (3) between the Owner and Architect or (4) between any persons or entities other than the Owner and Contractor.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

The Contractor acknowledges and agrees that the Contract Documents are adequate and sufficient to provide for the completion of the Work, and include all Work, whether or not shown or described, which reasonable may be inferred to be required or useful for the completion of the Work in accordance with all applicable laws, codes and professional standards.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.8 APPROVED

When the words approved, satisfactory, proper or as directed are used, approval by the Owner shall be understood.

§ 1.1.9 PROVIDE

When the word provide including derivatives thereof is used, it shall mean to properly fabricate, complete, transport, deliver, install, erect, construct, test and furnish all labor, materials, equipment, apparatus, appurtenances, and all items and expenses necessary to properly complete in place, ready for operation or use under the terms of the Specifications.

§ 1.1.10 BULLETINS AND REQUESTS FOR PROPOSAL

Bulletins and Requests for Proposal (RFP) are written or graphic instruments issued by the Architect or Owner after the execution of the Contract which request a proposal from the Contractor that, if accepted by the Owner, will cause the execution of a Change Order to modify the Contract Documents.

§ 1.1.11 KNOWLEDGE

The terms knowledge, recognize and discover, their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize) and discovers (or should discover) in exercising the care, skill, reasonable inquiry and diligence required by the Contract Documents and reasonable care. Analogously, the expression reasonably inferable and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising the care, skill, reasonable inquiry and diligence required of the Contractor by the Contract Documents.

§ 1.1.12 PERSISTENTLY

The phrase persistently fails and other similar expressions, as used in reference to the Contractor, shall be interpreted to mean any combination of acts and omissions, which causes the Owner to reasonably conclude that the Contractor will not complete the Work with the Contract Time, for the Contract Sum or in substantial compliance with the requirements of the Contract Documents.

(Paragraphs deleted)

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

1.2.1.1 In the event of inconsistencies within or between parts of the Contract Documents, or between the Contract Documents and applicable standards, codes and ordinances, the Contractor shall (1) provide the better quality or greater quantity of Work or (2) comply with the more stringent requirement; either or both. The terms and conditions of this paragraph 1.2.3, however, shall not relieve the Contractor of any of the obligations set forth in Paragraphs 3.2 and 3.7.

- .1 On the Drawings, given dimensions shall take precedence over scaled measurements, and large scale drawings over small scale drawings.
- .2 Before ordering any materials or doing any Work, the Contractor and each Subcontractor shall verify measurements at the Project site and shall be responsible for the correctness of such measurements. No extra charge or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference which may be found shall be submitted to the Architect for resolution before proceeding with the Work.
- .3 If a minor change in the Work (not affecting the intent of the project design) is found necessary due to actual field conditions, and for which the Contractor intends to seek modification of the Contract Price, the Contractor shall submit detailed drawings and/or a written proposal of such departure for the approval by the Architect before making the change.

1.2.1.2 As far as arrangement of equipment and material to conform to construction is concerned, Architectural and Structural Drawings and details shall govern rather than Mechanical and Electrical Drawings, but not to the extent of permitting any omission of items shown on Mechanical and Electrical Drawings because of any inconsistency with other Drawings.

1.2.1.3 The Contractor acknowledges and agrees that the Contract Documents are adequate and sufficient to provide for the completion of the Work, and include all work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in accordance with all applicable laws, codes and industry standards."

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§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

The Contractor represents that the Subcontractors, manufacturers, and suppliers engaged or to be engaged by them are and will be familiar with the requirements for performance by them of their obligations.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 General Conditions, Supplementary Conditions and Special Conditions as listed in the table of contents of the Project Manual apply to each Contractor and/or Subcontractor.

§ 1.2.5 Wherever singular number and/or words are used in the Specifications and the Work requires more than one of the items described, the plural and/or the word each shall be understood and inferred to mean as many units as are necessary for a complete installation shall be provided.

§ 1.2.6 The phrase Awork by others@ in the various divisions shall not be construed to mean that the Contractor is not responsible to coordinate that work as specified elsewhere.

§ 1.2.7 Similar conditions may be illustrated by a single detailed drawing. The drawing may be subject to minor adjustments as directed by the Owner to satisfy exact and specific conditions. If discrepancies appear, Contractor shall request interpretation from the Owner prior to proceeding with the Work. Contractor shall not make such interpretations by himself, except at its own risk, responsibility and expense.

§ 1.3 CAPITALIZATION

§ 1.3.1 Terms capitalized in these General Conditions include those which are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

§ 1.4.1 In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 EXECUTION OF CONTRACT DOCUMENTS

§ 1.5.1 The Contract Documents shall be signed by the Owner and Contractor.

§ 1.5.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents. The Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation, (1) the location, condition, layout and nature of the Project site and surrounding areas, (2) generally prevailing climatic conditions, (3) anticipated labor supply and costs, (4) availability and cost of materials, tools and equipment and (5) other similar issues. The Owner assumes no responsibility or liability for the safety of the Project site or any improvements located on the Project site within the Contractor's limits of disturbance. Except as set forth in Paragraph 9.1.2., the Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of this Paragraph 1.5.2.

§ 1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.6.1 The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications

and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' copyrights or other reserved rights.

§ 1.7 Confidentiality. The Contractor warrants and represents that the Contractor shall not knowingly or negligently communicate or disclose at any time to any person or entity any information in connection with the Work or the Project, except: (1) with prior written consent of the Owner, (2) information that was in the public domain prior to the date of this Agreement, (3) information which becomes part of the public domain by publication or otherwise not due to any unauthorized act or omission of the Contractor, or (4) as may be required to perform the Work or by any applicable law. The representations and warranties contained in this Paragraph 1.7 shall survive the complete performance of the Work or earlier termination of this Agreement.

1.7.1 The Contractor, at any time upon the request of the Owner, shall immediately return and surrender to the Owner all copies of any materials, records, notices, memoranda, recordings, drawings, specifications and mock-ups and any other documents furnished by the Owner or the Architect to the Contractor.

1.7.2 The Contractor shall specifically cause all Subcontractors or any other person or entity performing any services, or furnishing any materials or equipment, for the Work to warrant and represent all items set forth in Paragraph 1.7.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2

(Paragraphs deleted)

§ 2.2.2 Prior to commencement of construction, the Owner will obtain a Building Permit for the Project; all other permits, inspections and requirements for the Project, unless otherwise expressly stated in these Contract Documents, shall be the responsibility of the Contractor.

§ 2.2.3 The Owner shall not be responsible for furnishing surveys or other information as to the physical characteristics of legal limitations of, or utility locations for the Project Site, but shall furnish to Contractor a description of the Project site which shall not constitute one of the Contract Documents. Contractor shall confirm the location of each utility, shall excavate and dispose of each on-site utility, and shall cap each off-site utility if and as required by the Work and the Contract Documents. Owner shall make available to Contractor any reports of test borings, site geology and subsurface conditions that the Owner has in its possession; Owner is not responsible for the-

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sufficiency or accuracy of the information provided. Contractor acknowledges that Owner makes no warranty, guarantee or promise that the conditions indicated by the information provided are accurate and/or representative of those conditions existing throughout the Project site or any part thereof or that unforeseen developments may occur. The Contractor represents that it is familiar with the Project site and acknowledges that it has received all information it needs with regard to the conditions of the Project site. Contractor represents that it has inspected the Project site and the location of the Work and has satisfied itself as to the conditions thereof, including without limitation, all structural, surface and subsurface conditions.

§ 2.2.4 Information relevant to the Contractor's performance of the Work under the Owner's control shall be furnished by the Owner **with reasonable promptness** after receipt from the Contractor of a written request for such information or services.

§ 2.2.5 **The Contractor will be furnished free of charge eight (8) copies of the Drawings, Specifications and Project Manual.** Additional copies will be furnished upon payment by Contractor of the cost of reproduction, postage, and handling.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

§ 2.3.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, Owner may suspend the Work by written notice to Contractor if, in the Owner's sole determination, unforeseen conditions may adversely affect the quality and/or prosecution of the Work. Owner's rights pursuant to this subparagraph are cumulative and in addition to Owner's other rights enumerated throughout the Contract Documents.--

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

§ 2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, in its own discretion and without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the actual cost of correcting such deficiencies, including the Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall promptly pay the difference to the Owner.

§ 2.5. Extent of Owner Rights

2.5.1 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner (1) granted in the Contract Documents, (2) at law or (3) in equity. The Owner's actions shall not be deemed a waiver of any rights which the Owner may have under the Contract Documents. In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Owner in the Owner's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

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§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 The Owner and Contractor acknowledge that the Contract Documents have undergone numerous revisions. The Contractor shall carefully study and compare the Contract Documents with each other and shall at once report to the Owner errors, inconsistencies or omissions as discovered which may affect the Contract Price and shall further advise the Owner as to the required adjustments to the Contractor's bid. In the event such cost adjustments are not acceptable to the Owner, Owner shall have the right, prior to commencement of any work by Contractor on the Project, to revoke Contractor's selection without cost to Owner. Otherwise, the Contract Price will be adjusted accordingly, and the Contract executed.

3.2.1.1. The Contractor shall have the continuing obligation to report at once to the Owner any errors, inconsistencies, or omissions later discovered. Upon commencement of any item of Work, the Contractor shall be responsible for dimensions related to such item of Work and shall make any corrections necessary to make work properly fit at no additional cost to the Owner.

3.2.1.2. If, without notice to the Owner, the Contractor performs any additional and/or extra construction work involving, regarding and/or correcting a recognized error, inconsistency or omission in the Contract Documents, the Contractor shall not be entitled to any additional compensation for that additional construction work. Before ordering any products, the Contractor shall verify all measurements at the site and shall be responsible for the correctness of same.

3.2.1.3. The Contractor shall not be responsible for design liability, but shall use reasonable effort to find and disclose any errors, inconsistencies, or omissions in the documents.

3.2.1.4 Survey drawings describing the site, its physical characteristics, buildings, legal limits and utility locations are included with the Contract Documents for information purposes only. Should any discrepancy be discovered, Contractor(s) shall notify the Architect and Owner promptly.

3.2.1.5 Contractor(s) shall perform the Work in accordance with the Contract Documents and submittals reviewed pursuant to Paragraph 3.12. Contractor(s) shall make no changes therefrom without written acceptance by the Owner. Where detailed information is lacking, Contractor(s) shall refer to the Owner for information before proceeding with the specific work associated with the items for which information is requested.

§ 3.2.2 Any design errors or omissions noted by the Contractor during this review shall be reported **immediately and followed up in writing** to the Owner,

§ 3.2.3 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Owner in response to the Contractor's notices or requests for information pursuant to Sections 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Sections 4.3.6 and 4.3.7. If the Contractor fails to perform the obligations of Sections 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner for damages resulting from errors, inconsistencies or omissions in the Contract Documents unless such error, inconsistency, omission or difference could not be ascertained from a careful study of the Contract Documents.

- .1 The exactness of the grades, elevations, dimensions, or locations given on any Drawings issued by the Architect, or the work installed by other contractors, is not guaranteed by the Architect or Owner.
- .2 The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions and locations. In all cases of interconnection of its Work with existing or other work, it shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, locations or dimensions shall be promptly rectified by the Contractor without any additional cost to the Owner.

3.2.4. Except as to any reported errors, inconsistencies or omissions, and to concealed or unknown conditions defined in Paragraph 4.3.4, upon execution of any addendum regarding any Construction Phase, the Contractor represents the following:

- .1 The Contract Documents with regard to that Construction Phase are sufficiently complete and detailed for the Contractor to (1) perform the Work required to produce the results intended by the Contract Documents and (2) comply with all the requirements of the Contract Documents.
- .2 The Contract Sum is just and reasonable compensation for all the Work, including all unforeseen, foreseen and foreseeable risks, hazards, conditions and difficulties in connection therewith and that Contractor shall have no claim or right to an increase in the Contract Sum or Contract Time as a result of surface or subsurface conditions encountered.
- .3 The Contract Time is adequate for the performance of the Work.
- .4 The Work will not result in the lateral or vertical movement of any structure.
- .5 The Work required by the Contract Documents with regard to that Construction Phase, including, without limitation, all construction details, construction means, methods, procedures and techniques necessary to perform the Work, use of materials, selection of equipment and requirements of product manufacturers are consistent with: (1) good and sound practices within the construction industry; (2) generally prevailing and accepted industry standards applicable to the Work; (3) requirements of any warranties applicable to the Work; and (4) all laws, ordinances, regulation, rules and orders which bear upon Contractors performance of the Work.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, **including coordination of the duties of all trades** unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Owner. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any resulting loss or damage. Contractor shall be solely responsible for all locations, dimensions and levels, and no plea and/or defense as to instructions or orders received from any source, other than the information contained in the plot, drawings and specifications or in written orders of the Architect shall justify departure from the dimensions and levels required by the drawings. Contractor shall take its own measurements at the site, verifying same with the drawings and at the building, and will be held responsible for the proper fit of work completed in position.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and any entity or other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

At the earliest possible time after the commencement of the Work on the Project Site, the Contractor shall have all property corners and benchmarks verified or established by a State licensed land surveyor, shall locate the Project on the Project Site, establishing necessary reference marks and axes from which the Work accurately can progress, shall furnish the Architect evidence of such verification, and shall report at once any errors discovered during the process of such verification. If any of the Work is required to be inspected or approved by any public authority, the Contractor shall cause such inspection or approval to be performed. No inspection performed or failed to be performed by the Owner hereunder shall be a waiver of any of the Contractor's

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obligations hereunder or be construed as an approval or acceptance of the Work or any part thereof. The Contractor acknowledges that it is the Contractor's responsibility to hire all personnel for the proper and diligent execution of the Work and Contractor will use its best efforts to maintain labor peace for the duration of the Project. In the event of a labor dispute, the Contractor shall not be entitled to any increase in the Contract Sum.

§ 3.3.4 At the earliest possible time after commencement of the Work, Contractor shall have all property corners and benchmarks verified or established by a State-licensed land surveyor, shall locate the Project on the Project Site, establishing necessary reference marks and axes from which the Work can progress accurately, shall furnish the Owner evidence of such verification, and shall report immediately any errors discovered during the process of such verification.

§ 3.3.5 Contractor shall be responsible for laying out the Work and shall be responsible for all lines, elevations, and measurements of the Work. Contractor must exercise due care to verify all figures shown on the Drawings before laying out the Work and will be responsible for any errors or omissions resulting from failure to exercise due care.

§ 3.3.6 Contractor shall cause all required inspections and approvals by any public authority to be performed. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents by activities or duties of the Owner during the performance of the Work or by test, inspections or approvals required or performed by persons other than the Contractor, including inspections by any public authority for the Owner, or inspections or approvals performed by Owner's personnel. Nor shall any inspection performed or failed to be performed by the Owner be construed as a waiver of any Contractor obligations of the Contract Documents or as an approval or acceptance of the Work or any part thereof.

§ 3.3.7 Contractor shall base all measurements, both horizontal and vertical, from established bench marks. All work shall agree with these established lines and levels.

§ 3.3.8 Should Contractor discover any discrepancies between the actual measurements and those indicated, which prevent following good practice or the intent of the Contract Documents, the Contractor shall notify the Architect and Owner promptly.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. **The Contractor shall check all materials and labor entering into the Work and shall keep full detailed accounts thereof.**

§ 3.4.1.1. Unless otherwise directed by the Owner, Contractor(s) and each Subcontractor shall furnish at their expense, all scaffolding, trestles, ladders and platforms, and all other equipment that is required by applicable building and/or industry codes and is required for the execution of the Work under the Contract. Where it becomes necessary for the Contractor or any Subcontractor to move scaffolding and/or staging to permit installation of other work, it shall be moved at no cost to the Owner.

§ 3.4.2 The Contractor may make substitutions only with the consent of the Owner and in accordance with a Change Order **unless otherwise stated in the Contract Documents.**

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

§ 3.4.3.1 The Owner requires that there be no excessive noises and/or distractions in the work area except as necessary in the execution of the Work and prohibits the use of radios, record or tape players, etc.

§ 3.4.3.2 The Owner requires that there shall be no verbal or physical harassment of any person, nor shall there be any use of profanity, obscenity and/or other offensive language and/or conduct.

§ 3.4.3.3 The Owner officially defines sexual harassment as "any unwelcome sexual advances or requests for sexual favors and other verbal or physical conduct of a sexual nature that has the effect or purpose of unreasonably interfering with an individual's work or academic environment, or of affecting an individual's employment or academic status." Sexual harassment is a clear violation of the Owner's policy and it is also illegal and is considered a form of discrimination, covered under Title VII of the Civil Rights Act of 1964.

The Owner advises that sexual harassment may take many forms, but it always includes, but is not limited to, unwanted sexual attention such as: staring, leering and ogling; sexual teasing, jokes or gestures, repeatedly asking for dates after being refused, lewd remarks, whistles (when used in this context), references to someone's anatomy, inappropriate touching, attempts to kiss or fondle and coerced sexual activity.

Any reported verbal or physical harassment, including sexual harassment, incident will be investigated by the Owner. The offending party, if identified, may be dismissed from the Owner's property and not allowed to return. Repeated incidents by employees of a particular firm may be grounds for contract termination. The victim of the harassment shall retain the legal right to prosecute.

§ 3.4.3.4 The Contractor shall only employ labor and/or subcontractors on the Project or in connection with the Work capable of working harmoniously with all trades, crafts and any other individuals associated with the Project. The Contractor shall also use its best efforts to minimize the likelihood of any strike, work stoppage or other labor disturbance.

- .1 If the work is to be performed by trade unions, the Contractor shall make all necessary arrangements to reconcile, without delay, damage or cost to the Owner and without recourse to the Architect or the Owner, any conflict between the Contract Documents and any agreements or regulations of any kind at any time in force among members or councils— which regulate or distinguish what activities shall not be included in the work of any particular trade.
- .2 In case the progress of the Work is affected by any undue delay in furnishing or installing any items or materials or equipment required under the Contract Documents because of such conflict involving any such labor agreement or regulation, the Owner may require that other material or equipment of equal or similar kind and quality be provided pursuant to a Change Order or Construction Change Directive.

§ 3.4.4 Substitutions and alternates may be rejected without explanation and will be considered only under one or more of the following conditions:

- .1 required for compliance with interpretation of code requirements or insurance regulations then existing;
- .2 unavailability of specified products, through no fault of the Contractor;
- .3 subsequent information discloses inability of specified products to perform properly or to fit in designated space;
- .4 manufacturer/fabricator refuses to certify or guarantee performance or specified product as required, through no fault of the Contractor; or
- .5 when in the judgment of the Owner, that a substitution would be in the Owner's best interests, in terms of cost, time or other considerations.

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§ 3.4.5 After the Contract has been executed, the Owner will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the Specifications. By making requests for substitutions, the Contractor:

- .1 represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- .2 represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
- .3 certifies that the cost data presented is complete and includes all related costs under this Contract and waives all claims for additional costs related to the substitution which subsequently become apparent. The Contractor shall be responsible to highlight in writing any changes in mechanical, electrical, structural and architectural requirements which are occasioned by the substitution and shall also be responsible for the cost of any redesign of mechanical, electrical, structural, and architectural elements or systems occasioned by the substitution; and
- .4 obligates itself to coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects."

§ 3.4.6 The Owner shall be entitled to deduct from the Contract Sum amounts paid to any third-party to evaluate the Contractor's proposed substitutions and to make agreed-upon changes in the Drawings and Specifications made necessary by the Owner's acceptance of such substitutions."

§ 3.5 WARRANTY

§ 3.5.1 The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 Whether or not indicated in the Contract Documents, all workmanship shall be of good quality, all lines shall be plumb, straight, true and level. All finishes shall be of consistent pattern, texture and color. All finish work shall be clean and dust free. All fastening and connections shall be done in such a manner as to insure the maintenance of the finished work. All surfaces shall be free of waves, buckles and sags. All similar materials shall be of one type, class and quality.

§ 3.5.3 Nothing contained in Paragraph 3.5.4 shall be construed to establish a period of limitation with respect to any other obligation which Contractor might have under the Contract Documents. The establishment of the time period of one year after the Date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which Contractor's obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 3.5.4 The Contractor agrees to assign to the Owner at the time of final completion of the work, any and all manufacturers warranties relating to the materials and labor used in the work and further agrees to perform the work in such a manner so as to preserve any and all such manufacturers warranties. All warranties shall become effective from date of signature by the Architect of the Certificate of Substantial Completion, AIA Form G704, prepared by the Construction Manager for the project, portion thereof, or item of work as so described in the certificate.

§ 3.6 TAXES

§ 3.6.1 The Contractor shall pay all sales, consumer, use and other similar taxes required by law. The Owner is an exempt organization; the Contractor may issue exemption certification(s) in lieu of sales tax on the purchase, rental,

or lease of all materials, supplies, equipment and other tangible personal property incorporated into the property being improved by virtue of this Contract, as well as all materials, supplies, equipment and other tangible personal property used or consumed by the Contractor in performing this Contract. The Contractor may issue exemption certification(s) in lieu of sales tax for all of said materials and supplies. The uses of said materials and supplies for which an exemption from the said sales tax is claimed and any such exemption certification(s) shall comply with the applicable rulings of the State Comptroller.

3.6.1.1 Taxes paid by Contractor shall also include Unemployment and other applicable taxes imposed by local, City, State or Federal Government. Taxes and assessments on real property comprising the site of project are to be excluded.

§ 3.7 PERMITS, FEES AND NOTICES

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner shall obtain the Building Permit at its expense. All other permits and governmental fees, licenses and inspections imposed by any municipal agency and/or necessary for the proper execution and completion of the Work, are included in the Contract Sum and shall be the Contractor's responsibility.

The Contractor shall procure all certificates of inspection, use, occupancy permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful execution of the Work in sufficient time for occupation of the Project in accordance with the approved schedule for the Work. The costs of such procurement payment and delivery are included within the Contract Sum. Refer to Paragraph 2.2.2 as amended.

§ 3.7.2 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3

It shall be the obligation of the Contractor to review the Contract Documents to determine and to notify the Owner and the Architect of any discrepancy between building codes and regulations of which the Contractor has knowledge or should be reasonably able to determine. The Contractor shall not violate any zoning, setback, or other locational requirements of applicable laws, code, and ordinances, or of any recorded covenants of which the Contractor has knowledge unless such laws, statutes, ordinances, building codes and rules and regulations bear upon the performance of the Work. If the Contractor observes that portions of the Contract Documents are in variance with applicable laws, statutes, ordinances, building codes, rules or regulations, the Contractor promptly shall notify the Owner in writing and necessary changes shall be accomplished by appropriate modification.

§ 3.7.4 If the Contractor or any of its Subcontractors or Sub-subcontractors performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Owner, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.5. The Contractor shall notify the Owner in writing of notes, corrections, additions, etc. that have been issued by, marked on, or attached to, the Contract Documents or Contractor submittals by reviewing authorities.

§ 3.8 ALLOWANCES

§ 3.8.1

§ 3.8.2

(Paragraphs deleted)

§ 3.8.

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§ 3.9 SUPERINTENDENT

§ 3.9.1 Contractor shall employ a competent Project Manager and General Superintendent. Prior to commencement of the Work, a list of all supervisory personnel, including the Project Manager and Superintendent, that the Contractor intends to use on the Project and a chain-of-command organizational chart shall be provided to the Owner. Prior to being assigned to the Project, both the Project Manager and the General Superintendent shall be subject to the approval of the Owner. Once approved, without Owner's consent, the Project Manager and Superintendent shall not be removed or replaced from the Project so long as they are in the employ of the Contractor. The Owner has the right, at any time, for any reason or for no reason at all, in its sole and absolute discretion, to order the Project Manager or Superintendent or both removed from the Project. In such event, the Project Manager and/or Superintendent shall be immediately removed from the site and shall promptly be replaced by a competent replacement satisfactory to the Owner. Contractor shall be entitled to no compensation or time extension, whatsoever, as a result of the change.

§ 3.9.2 Prior to the start of Work, the Contractor's Superintendent shall thoroughly examine all Contract Documents and correlate each with the other. Contractor's Superintendent shall be fully familiar with all phases of the Work, various trades and the Contract Documents. Contractor's Superintendent and necessary assistance shall be in attendance at the Project site during the performance of the Work to include the completion of all punchlist items. Contractor's Superintendent shall supervise all Work of the Contractor and its subcontractors to ensure that it is performed strictly in accordance with requirements of the Contract Documents.

§ 3.9.3 The Superintendent shall represent the Contractor and communications given to the Superintendent shall be as binding as if given to the Contractor. Important communication shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 Unless a Contract Schedule is included in the Contract Documents, promptly after award of the Contract, Contractor shall prepare and submit for Owner's approval a Contractor's construction schedule for the Work.

3.10.1.1 The construction schedule shall be in a detailed precedence-style critical path management ("CPM") or primavera-type format satisfactory to the Owner that shall also (a) provide a graphic representation of all activities and events that will occur during performance of the Work; (b) identify each phase of construction and occupancy; and (c) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter, the "Milestone Dates"). Contractor's schedule shall take into consideration normal seasonal weather conditions, number of precipitation days per month (as defined by the National Weather Service 30-year average) along with muddy site days directly related to the precipitation days indicated.

3.10.1.2 Upon review and approval of the Milestone Dates by the Owner, the construction schedule shall be deemed a part of the Contract Documents and attached to the Agreement as an exhibit. If not accepted, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and resubmitted for acceptance.

3.10.1.3 The Contractor shall monitor the Work for conformance with the requirements of the contract schedule and shall promptly advise the Owner of any delays or potential delays.

3.10.1.4 The accepted construction schedule shall be updated, in the same format, at least monthly or as more frequently requested by the Owner, to reflect actual conditions. Contractor shall not unreasonably compress the scheduled duration of construction activities or unreasonably overlap construction activities on any schedule update. In the event any schedule update indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any construction schedule update or progress report constitute an adjustment in the Contract Time, and Milestone Date, or the Contract Sum unless any adjustment is agreed by the Owner and authorized pursuant to Change Order.

3.10.1.5 Contractor acknowledges that the acceptance of an agreed construction schedule and the submission of all required construction schedule updates are prerequisites to and condition precedents to payment by the Owner to the Contractor."

§ 3.10.2 The Contractor shall prepare and keep current, for the Owner's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Owner reasonable time to review submittals.

Schedule of submittals to be presented to the Architect no later than thirty (30) days after Contract is awarded unless otherwise stated in the Contract Documents.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.10.4 In the event Owner determines, in its sole discretion, that the performance of the Work, as of a Milestone Date, has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including without limitation, (a) working additional shifts or overtime, (b) supplying additional manpower, equipment, and facilities, and (c) other similar measures (hereinafter referred to collectively as "Extraordinary Measures"). The Owner's right to require Extraordinary Measures is cumulative and in addition to all other rights of the Owner set forth in the Contract Documents. The Owner may exercise the rights set forth herein as frequently as the Owner deems necessary to ensure Contractor's performance of the Work will comply with any Milestone Date or completion date set forth in the Contract Documents. Contractor shall not be entitled to any adjustment in the Contract Sum in connection with the Extraordinary Measures required by the Owner.

§ 3.10.5 Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the operation of the Owner's premises. The Contractor shall, upon the Owner's request, reschedule any portion of the Work affecting operation of the premises during hours when the premises are not in operation. Any postponement or rearrangement made by the Contractor pursuant to this subparagraph shall not entitle the Contractor to an adjustment of the Contract Sum. Contractor shall not be entitled to any adjustment to the Contract Time unless the postponement or rescheduling caused an actual delay to other critical-path construction activities the impact of which could not be absorbed through minor adjustments to the schedule, duration or sequencing of other activities.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

§ 3.11.1 The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record field changes, as-built conditions and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. Within sixty (60) days of completion of the Work, these documents shall be delivered to the Owner with written certification, signed by the Contractor, that the documents show complete and exact "as-built" conditions, including the sizes, kinds of materials, vital piping, conduit locations and similar information. The Contractor shall maintain all approved permit drawings in a manner so as to make them accessible to the Owner and all governmental inspectors.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept

expressed in the Contract Documents. Review by the Owner is subject to the limitations of Section 4.2.7. Informational submittals upon which the Owner is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Owner without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Owner Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Owner without action.

§ 3.12.6 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Owner.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Owner in writing of such deviation at the time of submittal and (1) the Owner has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Owner's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Owner on previous submittals. In the absence of such written notice the Owner's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services which constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Contractor will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Contractor shall satisfy itself that the selected design professionals carry adequate professional errors and omissions insurance coverage. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Owner. The Owner and the Contractor shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided the Owner and Contractor have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Owner will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

The Contractor shall assemble for the Owner's approval, three (3) copies, in loose-leaf binders, of all operating and maintenance data from all manufacturers whose equipment is, or will be, installed in the Work. The Contractor shall also prepare a checklist or schedule showing the type of lubricant to be used at each point of application and the intervals between lubrication of each item of equipment.

Init.

§ 3.12.12 All shop drawings for any architectural, structural, mechanical or electrical work must be submitted to, and approved by, the Architect. The Contractor represents and warrants that all shop drawings shall be prepared by persons and entities possessing expertise and experience in the trade for which the shop drawing is prepared and, if required by the Architect or applicable law, by a licensed engineer.

§ 3.12.13 The Owner's review of Contractor's submittals will be limited to examination of an initial submittal and one (1) resubmittal. The Owner shall be entitled to deduct from the Contract Sum costs incurred for evaluation of any additional resubmittals.

§ 3.12.14 The Contractor shall assemble for the Owner's approval, three copies, organized in loose-leaf binders, of all operating and maintenance data and instruction from all manufacturers whose equipment is, or will be, installed in the Work. The Contractor shall also prepare a checklist or schedule showing the type of lubricant to be used in each point of application and the intervals between lubrication of each item of equipment.

§ 3.13 USE OF SITE

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

- 1. Material storage, location of temporary sheds and offices, etc. shall have specific approval of the Owner and the Architect.**
- 2. No operations shall be permitted outside "Contract Limits" except as necessary to comply with Contract requirements.**
- 3. In addition to an orderly stockpiling of materials to be built into the structure, such items as used lumber, scaffolding, planking, etc. shall be stacked orderly while on site. All must be kept free of accumulated waste materials and rubbish.**
 - a. Diligence shall be exercised in keeping working areas and traffic ways completely free of any obstruction, large or small, at all times.**
 - b. Accumulated debris and rubbish must be removed by the Contractor from the premises promptly and daily. Stockpiling of debris will not be allowed.**

The Contractor shall assure free, convenient, unencumbered and direct access to properties neighboring the Project Site for the owners of such properties and their respective tenants, agents, invitees, and guests.

3.13.2 Operating systems, utilities and services serving the existing buildings, structures and project site shall be maintained in operation at all times. Such operating systems, utilities and services include, but are not limited to, water, electrical power, natural gas, heating, ventilating, air conditioning, sanitary sewer, fire alarm, telephone, security, cable television and communications cabling. To the extent Contractor believes it is necessary or advisable to disable or deconstruct portions of such operating systems, utilities and services, for a short period of time, to perform the Work, Contractor shall first obtain written approval from the Owner. To obtain Owner's written approval for a short disabling or deconstruction of such operating systems, utilities and services, Contractor shall make a written request to Owner in which the Contractor specifies (a) the particular systems to be disabled/deconstructed (and affected areas), (b) the purpose for the action, (c) the proposed schedule for cut over, cut-off, disruption or other change in operation of the affected system(s) and (d) the specified date by which such operating systems, utilities and services shall be fully enabled. Owner may require that such cut over, cut off, disruption or other change in operation of the affected system(s) occur after normal working hours or on holidays or weekends. If written approval of the Owner is received in response to Contractor's compliant written request, then the limits and schedules of disruption of systems, services and utilities shall be strictly adhered to and not modified without written agreement of the Owner.

3.13.3 Contractor(s) and all Subcontractors shall keep employees out of areas beyond the Contract limit lines except where necessary for actual performance of work. The Contractor shall not obstruct or prevent convenient access to properties neighboring the Project Site.

Init.

3.13.4 Only materials and equipment which are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. All materials must be orderly stockpiles and stacked while on the site. The site shall be kept free of accumulated waste and rubbish which shall be removed from the site by the Contractor promptly and daily. Stockpiling of debris is not permitted. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor. Material storage, location-of temporary structures, including without limitation sheds and offices, shall be approved by the Owner.

3.13.5 Fire lanes shall be maintained and remain accessible at all times. Contractor shall provide and maintain temporary "all-weather" emergency vehicle access roads as required by Baltimore County and/or the State of Maryland

3.13.6 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner, which may be withheld at the sole discretion of the Owner.

3.13.7 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrances and parking areas other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time, including without limitations, the prohibitions against smoking, the playing of music, profane language and lewd behavior. The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds that compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such compliance and suggesting alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirements of the rules and regulations. The Contractor shall also comply with all insurance requirements applicable to the use and occupancy of the Project site and the Building.

3.13.8 It is important that the building facilities be used for normal functions during the construction period. The Contractor shall request from the building principal his/her requirements for special areas so as to allow the principal to schedule the affected areas for both construction and normal activities during the construction period. The building-principal will cooperate with the Contractor in making the requested special areas available for special periods of time.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

Each Division of the Specifications shall include all cutting, fitting, and patching for that trade division, unless herein specifically stated to the contrary, including that required for the proper accommodation of other trades. The above, however, does not relieve the Contractor from responsibility as stated in Paragraph 3.14.1.

Patchwork shall match existing or adjoining in every respect.

§ 3.14.3 Each division of the Specifications shall include all cutting, fitting and patching for the trade division, unless herein specifically stated to the contrary, including that required for the proper accommodation of other trades. Notwithstanding, Contractor remains obligated as provided in paragraph 3.14.1.

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§ 3.14.4 Patching shall match existing or adjoining conditions in every respect.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

3.15.1.1 The Contractor shall be responsible for broken glass and at the completion of the Work shall replace such damaged or broken glass. After damaged or broken glass has been replaced, the Contractor shall remove all labels, wash and polish both sides of all glass.

In addition to general broom cleaning, the Contractor shall perform the following final cleaning for all trades at completion of the Work.

1. Remove temporary protection.
2. Remove marks, stains, fingerprints, and other soil or dirt from painted, decorated and natural finished woodwork and other Work.
3. Remove spots, plaster, soil, and paint from ceramic tile, marble and other finished materials, and wash or wipe clean.
4. Clean fixtures, cabinet work and equipment removing stains, paint, dirt and dust and leave same in undamaged, new condition.
5. Clean aluminum in accordance with recommendation of the manufacturer.
6. Clean resilient floors thoroughly with a well rinsed mop containing only enough moisture to clean off any surface dirt or dust and buff dry by machine to bring the surfaces to sheen.

3.15.1.2 Special Cleaning: Besides the general broom cleaning and the Subcontractor's cleaning, the Contractor shall do the following final cleaning for all trades at completion of the Work.

1. Remove any and all debris from premises resulting from the operation.
2. Remove all temporary protection.
3. Remove putty stains, labels, and paint from all glass and wash and polish same.
4. Remove all marks, stains, fingerprints, and other soil or dirt from all painted, decorated and stained work and from all waxed woodwork.

§ 3.15.2 At the conclusion of the Work, Contractor shall perform a final cleaning that shall at least include the following:

- .1 broom cleaning of entire premises;
- .2 removal of all temporary protection;
- .3 removal of all marks, stains, fingerprints, and other soil and dirt from painted, decorated and natural finished woodwork;
- .4 removal of spots, plaster, concrete, grout, soil and paint from ceramic tile, marble, slabs, fixtures, counters, cabinet work, equipment and other finished materials and the washing or wiping clean of such finished materials;
- .5 cleaning of aluminum in accord with the manufacturer's recommendations;
- .6 thorough cleaning of resilient floors with a well rinsed mop containing only enough moisture to clean off any surface dirt or dust and buff drying of those floor to bring the surfaces to sheen;
- .7 removal of all putty stains, labels and paint from all glass and washing and polishing of both sides of all glass; and
- .8 removal of all debris from the premises.

§ 3.16 ACCESS TO WORK

§ 3.16.1 The Contractor shall provide the Owner access to the Work in preparation and progress wherever located. All access to the site will be limited to entry designed by the Owner.

Init.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

§ 3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Owner.

§ 3.18 INDEMNIFICATION

§ 3.18.1 Contractor(s) shall indemnify and hold harmless the Baltimore County Board of Education and Baltimore County Public Schools and their respective officers, directors, elected officials, agents, consultants and employees of any of them from and against all claims, damages, losses or expenses, including, but not limited to, attorneys' fees and other costs arising out of or relating to in whole or in part, in any manner, directly or indirectly, any of the following:

- (1) performance of the Work;
- (2) bodily injury, sickness, disease or death;
- (3) injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom;
- (4) governmental fines and/or penalties of any kind whatsoever;
- (5) corrective measures, fines, penalties or costs required under the Federal Occupational Safety and Health Act (hereinafter referred to as OSHA), and or the State of Maryland (MOSHA) equivalent and all federal, state and local construction safety laws by reason of Contractor's non-compliance with those laws, or by reason of the conduct of Contractor, its subcontractors or suppliers at any tier or any of their employees, representatives, or agents;
- (6) delay in completion of the work beyond the Contract Time, as defined in Article 8, caused by proceedings under OSHA;
- (7) necessary taxes, permits, licenses, and inspections fees as required for Contractor's scope of work;
- (8) royalty and license fees and all alleged violations, misappropriations and/or infringements of any patent, copyright, trademark, trade dress, trade secret or other intellectual property or proprietary rights pertaining to work furnished by Contractor;
- (9) the acts or omissions of the Contractor, its officers, directors, principals, agents, employees or subcontractors, in the performance of this Contract Agreement or the Work, including all warranties, certifications, and representations made by Contractor.

This indemnification shall be fully applicable to all Losses even though such Losses may have been contributed to, or are alleged to have been contributed to, by some act or omission of the Owner or other indemnified person. The parties acknowledge that the indemnification provisions contained herein are material inducements to the execution of this Contract Agreement and are provided in consideration of the mutual promises, agreements and covenants contained herein, the receipt and legal sufficiency of which consideration is hereby acknowledged. The parties agree that the provisions of this paragraph and all other representations, warranties, indemnities, covenants and other obligations of Contractor in this Contract Agreement shall survive the execution, termination, or performance hereof and shall continue thereafter.

This indemnification in favor of the Owner shall be applicable and the Owner, its agents, consultants and employees of any of them, shall be indemnified as long as there is no determination by a court of competent jurisdiction or arbitration panel that any of the causes listed in items (1) through (9) which is the basis of the claim, was caused by sole negligence of the Owner, its agents and employees or any of them. The Contractor shall, pursuant to this indemnification provision, pay the attorney's fees, expenses, judgments and settlements made by or on behalf of the Owner, its agents and employees of any of them, arising out of claims to which this indemnification applies unless and until there should be a finding by a court of competent jurisdiction or arbitration panel that the damages alleged were caused by the sole negligence or fault of the Owner, its agents and employees of any of them. Such obligation

shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

The obligations of the Contract under Paragraph 3.18 shall not extend to the liability of the Architect, the Architect's consultants, and the agents and employees of either of them arising out of their negligence.

The Contractor shall provide all documents, reports and other information requested by any lender, escrowee under construction, loan escrow or title insurer and shall cooperate with such lender, escrowee or insurer to the fullest extent possible.

If Owner's lender, if any, shall designate an inspecting Architect or other representative, the Owner may require the concurrence of such Architect or representative in each instance, in which the approval of the Architect is required by any provision of these General Conditions or other Contract Documents. The Contractor shall cooperate with such inspecting Architect or representative to the fullest extent possible.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

§ 4.1 ARCHITECT

§ 4.1.1

(Paragraphs deleted)

§ 4.2 OWNER'S ADMINISTRATION OF THE CONTRACT

§ 4.2.1

§ 4.2.2 The Owner will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Owner will neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1. The Owner's site visits are for the sole purpose of determining the quantity of materials in place for monthly applications for payments, and shall not be construed to impose any obligations or liability on the Owner for any reason including, without limitation, supervision, scheduling, and concealed conditions.

4.2.2.1 The Owner shall be entitled to deduct from the Contract Sum amounts paid to any third-parties for additional site visits made necessary by the fault, neglect or request of the Contractor.

§ 4.2.3 The Owner will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Owner will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4

Owner and Contractor may communicate with each other directly or through the Architect. Communications by and with Sub-contractors, Sub-subcontractors and material suppliers shall be through the Contractor. Communications by and with separate Contractors shall be through the Owner.

§ 4.2.5

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§ 4.2.6

§ 4.2.7 The Owner will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given. The Owner's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Contractor while allowing sufficient time to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Owner's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Owner's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Owner, of any construction means, methods, techniques, sequences or procedures. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8

§ 4.2.9 The Owner will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents. The Owner's inspection and issuance of a Certificate for Final Payment and Owner's payment shall not relieve Contractor of responsibility for defects in the Work.

§ 4.2.10

§ 4.2.11 The Owner will interpret and decide matters concerning performance under and requirements of, the Contract Documents on written request of the Contractor. The Owner's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made for them.

§ 4.2.12 Interpretations and decisions of the Owner will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings.

§ 4.2.13 The Owner's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Owner will not be responsible for any design calculations, or the result therefrom, which are required of the Contractor, Subcontractors or suppliers, either by provisions of the Contract Documents or inherently required by the Contractor, Subcontractors or suppliers for their proper performance of the work.

§ 4.2.15 No provision of any referenced standard, standard specification, manual or code, whether or not specifically incorporated by reference in the Contract Documents, shall change the duties and responsibilities of the Owner or Contractor from those defined in the Contract Documents nor shall it assign any responsibilities to the Owner or Contractor other than those responsibilities listed in the General Conditions.

§ 4.3 CLAIMS AND DISPUTES

§ 4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be initiated by written notice **on Contractor's letterhead**. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 4.3.2 Notice of Claims by Contractor must be made within ten (10) days after occurrence of the event giving rise to such Claims or within ten (10) days after the Contractor first recognizes the condition giving rise to the Claim, whichever is later. Claims must be made by written notice to the Owner within fourteen (14) days after the conclusion of the occurrence. Any additional Claim made after the initial Claim has been implemented by Change Order will not be

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considered. No Claim shall be valid unless first a Notice of Claim is sent and the claim is filed, both within the time prescribed by this subparagraph. Additional provisions herein regarding Claims for Additional Costs shall apply.

§ 4.3.3 Continuing Contract Performance. Pending final resolution of a Claim except as otherwise agreed in writing or as provided in Section 9.7.1 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 4.3.4 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Owner will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Owner determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Owner shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the Owner has given notice of the decision. No adjustment in the Contract Time or Contract Sum shall be permitted, however, in connection with a concealed or unknown condition which does not differ materially from those conditions disclosed or which reasonably should have been disclosed by the Contractor's (1) prior inspections, tests, reviews, and preconstruction services for the Project, or (2) inspections, tests, reviews, and preconstruction services which the Contractor has the opportunity to make or should have performed in connection with the Project.

§ 4.3.5 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.6.

§ 4.3.6

§ 4.3.7 Claims for Additional Time

§ 4.3.7.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

§ 4.3.7.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. Abnormal weather conditions not reasonably anticipated shall mean weather conditions which prevent work on the Project and which have a direct effect on the Contractor's predefined critical path sequence and which could not have been anticipated in Contractor's proposed construction schedule.

§ 4.3.8 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 4.3.9 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 4.3.10

(Paragraphs deleted)

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The Contractor waives all claims against the Owner for consequential and incidental damages whether based on claims or causes of action in tort, contract, strict liability, equity, or law arising out of or in any way relating to this Contract Agreement, the Work, or the actions or inactions of the Owner or anyone for whom the Owner may be legally liable to the Contractor. This waiver includes claimed damages and/or cost incurred by the Contractor for principal/home office expenses including the compensation of personnel stationed there, for losses of financing, *(Paragraphs deleted)* business, use, income, opportunity and/or reputation, and for loss of management and/or employee productivity, and for loss of profit. This waiver is applicable, without limitation, to all consequential damages due to the termination of the Contract. Nothing contained in this subparagraph 4.3.10 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 4.4 RESOLUTION OF CLAIMS AND DISPUTES

§ 4.4.1 At the Owner's option, Claims asserted by either party shall be subject to arbitration by a single arbitrator under the American Arbitration Association Construction Industry Arbitration Rules, to be held in Baltimore County, Maryland. The decision of the arbitrator(s) shall be final, binding, enforceable and not subject to appeal. Any such award may be enrolled, but not challenged, in the Circuit Court for Baltimore County.

4.4.2 This Contract Agreement shall be governed, enforced, performed and construed in accordance with the laws of the State of Maryland (except those conflicts of laws provisions which would serve to defeat application of Maryland substantive law.) Each of the parties hereto hereby submits to exclusive jurisdiction of the state and/or federal courts located within Baltimore County, Maryland for any suit, hearing, or other legal proceeding of any nature, kind, or description whatsoever in the event of any dispute or controversy arising hereunder or relating hereto, or in the event any ruling, finding, or other legal determination is required or desired hereunder. BECAUSE OF THE SPECIALIZED NATURE OF CONSTRUCTION RELATED LITIGATION, EACH PARTY HERETO IRREVOCABLY WAIVES ITS RIGHT TO A JURY TRIAL IN ANY LITIGATION ARISING OUT OF OR RELATING TO THIS CONTRACT AGREEMENT.

4.4.3 The Owner and the Contractor acknowledge that they have been represented by legal counsel and have had sufficient opportunity to have the Contract Documents, including these Supplementary Conditions and the particulars of this Section 4, reviewed and explained by its legal counsel prior to execution of the Agreement. The waivers and other provisions of this section (including without limitation, the waiver of jury trial and consequential damages) are knowingly, willingly and voluntarily made and not made based on the representations or statements of anyone except as set forth in the Contract Documents.

(Paragraphs deleted)

§ 4.5 MEDIATION

§ 4.5.1

§ 4.5.2

§ 4.5.3

§ 4.6 ARBITRATION

LITIGATION PROCEDURES

Refer to BCPS Part I: General Terms and Conditions.

§ 4.6.1

§ 4.6.2

§ 4.6.3

§ 4.6.4

§ 4.6.5

§ 4.6.6

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ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct **Contract** with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

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

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Owner will promptly reply to the Contractor in writing stating whether or not the Owner has reasonable objection to any such proposed person or entity. Failure of the Owner to reply promptly shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner has no reasonable objection. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected if the Owner makes reasonable objection to such substitute.

§ 5.3 SUBCONTRACTUAL RELATIONS

§ 5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner. Each Subcontract agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement which may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.3.2 Notwithstanding any provision of subparagraph 5.3.1, any part of the Work performed for the Contractor by a Subcontractor or its Sub-subcontractor shall be pursuant to a written subcontract between the Contractor and such Subcontractor (or the Subcontractor and its Sub-subcontractor at any tier) which shall be prepared on a form of Subcontract satisfactory to the Owner in all respects. Each subcontract shall, where the context permits, contain provisions that:

- .1 require that such Work be performed in strict accord with the requirements of the Contract Documents;

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- .2 waive all rights the contracting parties may have against each other or that they may have against the Owner for damages caused by fire or other perils covered by insurance required by the Contract Documents;
- .3 require the Subcontractor to carry and maintain insurance coverage in accordance with the Contract Documents and to file certificates of such coverage with the Contractor;
- .4 require the Subcontractor to submit certificates and waivers of liens for Work completed by it and its Sub-subcontractors as a condition precedent to the disbursement of the progress payment next due and owing;
- .5 require submission to Contractor/ Subcontractor, as the case may be, of applications for payment in a form approved by the Owner, together with clearly defined invoices and billings supporting all such application under each Subcontract to which the Contractor is a party;
- .6 report, so far as practicable, unit prices and any other feasible formula for use in the determination of costs of changes in the Work;
- .7 require such Subcontractor to furnish the Contractor, in a timely fashion, all information necessary for the preparation and submission of the reports required herein;
- .8 require that each Subcontractor continue to perform under its subcontract in the event the Contract is terminated, and automatically permitting the Owner, at its discretion, to take an assignment of the Subcontract and request the Subcontractor to continue its performance of the Work;
- .9 require each Subcontractor to remove all debris created by its activities;
- .10 require each Subcontractor to provide sufficient labor and materials to meet the Milestone Dates and Contract Schedule;
- .11 if required by law, require each Subcontractor to certify that it is an equal opportunity employer as described in applicable law.

§ 5.3.3 The Contractor shall not enter into any subcontract, contract agreement, purchase order or other arrangement for the furnishing of any portion of the materials, services, equipment or work with any party or entity if such party or entity is an affiliated entity with which the Contractor has a direct or indirect ownership, control or interest unless such agreement has been approved by the Owner after full disclosure in writing by the Contractor to the Owner of such affiliation or relationship and all details relating to the proposed arrangements.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

- .1 assignment is effective only after termination of the Contract by the Owner **or stoppage of the Work by the Owner** and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. .

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

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement.

The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights which apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Owner apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor. If such separate Contractor initiates legal or any other proceedings against the Owner on account of any such damage allege to have been caused by the Contractor or its Subcontractors, the Owner shall notify the Contractor who shall defend the actions at its own expense. If any judgment or award is made against the Owner from such action, the Contractor shall pay or otherwise satisfy the judgment or award and shall reimburse the Owner for all attorney's fees, court costs and other expenses that the Owner incurred in connection with such actions.

§ 6.2.4 The Contractor shall promptly remedy damage caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

§ 6.3.1 If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner and Contractor; a Construction Change Directive may be unilaterally issued by the Owner and may or may not be agreed to by the Contractor; an order for minor change in the Work may also be issued unilaterally by the Owner.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work. Except as permitted in Paragraph 7.3 and Paragraph 9.7.2, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that the Owner has been unjustly enriched by any alteration or addition to the Work, whether or not there is, in

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fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

§ 7.2 CHANGE ORDERS

§ 7.2.1

§ 7.2.2 .

1. **Should it be desired at any time (or times) during the progress of Work to make any alterations or changes to add to or delete Work, the Owner shall have the undisputed right to make such changes, omissions, additions, or alterations by written order.**
2. **A written request for a change in the Work may be made by the Owner, the Architect, or the Contractor, but only the Owner shall authorize and approve the change.**
3. **The change will be issued in the form of written "Change Order Form" signed by the Owner and the Contractor, which authorized the change in the Work, indicated the mutually agreed upon price which shall be added to or deducted from the Contract price, and the extent which the Contract time shall be increased or decreased.**
4. **The Contractor shall furnish, in triplicate, to the Owner and Architect a fully itemized breakdown of the quantities and process used in computing the value of any change that might be requested. All written requests for a change in the Work must include the full explanation and justification for the change regardless of its nature.**
5. **For all Work to be performed by a Subcontractor, the Contractor shall furnish the Subcontractor's itemized proposal which shall contain the original signature by an authorized representative of the Subcontracting firm. If requested by the Owner or Architect, proposals from suppliers or other supporting data to substantiate the Contractor's or Subcontractor's cost shall be furnished.**
6. **All proposals and breakdowns shall be submitted promptly.**
7. **When changes, alterations, deductions, or additions are so ordered, the value of such Work will be determined in the following ways:**
 - 7.1 **When prices are stated in the Contract or have been subsequently agreed upon by application or those unit prices.**
 - 7.2 **A lump sum price agree to by the Owner and the Contractor, or,**
 - 7.3 **If job conditions, or the extent of the change, prohibit the use of either 7.1 or 7.2, a price arrived at by performing the Work on a cost plus not to exceed basis.**
 - 7.4 **If a change involves merely a credit, the Contract Price will be reduced by the amount it would have cost the Contractor if the omitted item or Work had not been eliminated, including the overhead and profit; however, the Contractor and the Subcontractor will each be allowed to retain a sum not in excess of three percent (3%) of the credit for handling.**
 - 7.5 **If a change involves both an extra and a credit, both sums shall be shown and the two sums balanced to determine the adjusted total cost or credit. No allowances to the Contractor shall be made or allowed for loss of anticipated profits on account of any changes in the Work.**
 - 7.6 **Unless specified otherwise, the allowable mark-up for combined overhead and profit Work performed by the Contractor and his own forces will be based on the monetary value of the Work in accordance with the following schedule:**

Combined Overhead and Profit	Value of Work
15%	\$0-\$25,000

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- | | Negotiated but not more than 10% | Over \$25,000 |
|------|--|---------------|
| 7.7 | <p>For Work performed by a Subcontractor with his own organization, the percentages for combined overhead and profit will be outlined in 7.6 above. On Work partly or solely performed by a Subcontractor, the Contractor will be allowed no greater than eight percent (8%) of the amount of the Subcontractor's labor and material costs only. No other mark-up of any kind will be allowed; (for example, the Contractor cannot add their profit and overhead to a Subcontractor's overhead and profit, taxes, equipment rental, or other similar non-labor, non-material items). This arrangement of applied overhead and profit pertains to all levels of the contracting hierarchy, e.g., Subcontractors, Sub-subcontractors, etc.</p> | |
| 7.8 | <p>When the Contractor and the Owner shall fail to agree upon a lump sum price or method as outlined in 7, the Owner shall have the right to issue an order for the Work to be accomplished on a time and material basis and a correct amount shall be kept by the Contractor and approved by the Owner and/or Architect of the actual cost of all labor and materials as directed by the Owner and/or Architect to which shall be added percentage allowances for overhead and profit as stated in Paragraph 7. Receipted invoices shall be submitted to the Owner to validate the cost of all shop fabricated material and cost of all other materials supplied. Certified payrolls shall be submitted for labor costs.</p> | |
| 7.9 | <p>On all Work, no Contractor will be allowed any expenses, overhead, or profit for employment or another Subcontractor to perform Work for him.</p> | |
| 7.10 | <p>Further, on Work covered by Change Order, the Contractor will be reimbursed for the actual increased cost of bond, without any percentage added, when proof of the bond change is received.</p> | |
| 7.11 | <p>The cost of Foreman and Superintendents may be added when the Change Order makes necessary the hiring of additional supervisory personnel or makes their employment for time additional to that required by the basic Contract.</p> | |
| 7.12 | <p>The Contractor shall be allowed the actual cost for rental of machine power tools or special equipment, including fuel and lubricants which are necessary to execute the Work required on the change, but no percentages shall be added to this cost. The rental rate is to be agreed upon by the Owner and Contractor, the rate generally to be the latest as filed by the Associated Equipment Distributors.</p> | |
| 7.13 | <p>If the Contractor and the Owner cannot agree as to the extent the Contract time shall be increased for extra Work, or the extent the Contract time shall be reduced for the Work omitted by the Owner, the increase or decrease as the case may be shall be in the same proportion of the original Contract as the cost of the additional Work, including overhead would have cost as aforesaid bears to the total Contract price.</p> | |
| 7.14 | <p>No order for change at any time or place shall in any manner or to any extent relieve the Contractor of any of his obligations under the Contract.</p> | |
| 7.15 | <p>The Architect with the concurrence from the Owner, shall have authority to make minor changes in the Work, not involving extra cost, and not inconsistent with the purposes of the building. Otherwise, except in any emergency endangering life or property, no extra Work or change shall be made unless a written order from the Owner and/or Architect has been received by the Contractor. No claims for additional changes to the Contract Sum or time completion shall be valid unless so ordered.</p> | |

§ 7.2.3 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work which is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated

with such change and any and all adjustments to the Contract Sum; any and all adjustment to the Contract Time, the Control Estimate, and Construction Schedule. In the event a Change Order increases the Contract Sum, Contractor shall include the Work covered by such Change Orders in Applications for Payment as if such Work were originally part of the Contract Documents.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall not be used as a substitute for a Change Order. A Construction Change Directive only directs the Contractor to proceed with the change and a Change Order must be issued in order to adjust the Contract Sum and Contract Time.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 as provided in Section 7.3.6.

§ 7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Owner of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Owner on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Owner may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.6 shall be limited to the following:

- .1 costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .5 additional costs of supervision and field office personnel directly attributable to the change. Provided however, the Contractor shall provide an itemized breakdown showing quantities, unit costs, hours and rates of labor, and other costs and such detail as may be required to allow the reasonableness of cost to be established. Similar cost information covering Subcontractors' work shall be included as a part of the Contractor's Proposal. Minimum charges for "handling" will not be acceptable. The allowable overhead and profit mark-ups to be included in the Total Cost to Owner shall be based on the following schedule.

1. For each Subcontractor or Sub-subcontractor involved, the Work performed by that Subcontractor

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or Sub-subcontractor's own forces - fifteen percent (15%) of their Cost of the Work where their Cost of Work is less than \$25,000.00 and ten percent (10%) where their Cost of Work is \$25,000.00 or more.

2. For each Subcontractor for Work performed by the Subcontractor's subcontractor - five percent (5%) of the amount due the sub-subcontractor.

In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of the cost including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also. In no case will a charge involving over \$500.00 be approved without such itemization. A change order must include each of the items listed in this paragraph. In the event there is no change in the contract time or contract amount, it must be noted that no such change is intended. A change order is all-inclusive. That is, a change order must indicate the change in Contract Sum, including any overhead and profit of the contractor, and in the Contract Time. The Contractor cannot later request additional sums for a prior change order because it did not include overhead, profit, or similar items. If additional contract time is indicated on the change order and the Contractor intends to claim any cost for time on any basis, the change order must include all additional costs, if any, associated with the additional time. When both additions and credits are involved in any one change order, the allowance for overhead and profit shall be figured on the basis of the net increase, if any.

§ 7.3.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Owner. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Owner will make an interim determination for purposes of monthly certification for payment for those costs. That determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a claim in accordance with Article 4.

§ 7.3.9 When the Owner and Contractor agree concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order. **Percentages for overhead and profit shall be the same as stated in Subparagraph 7.2.1.7.6.**

§ 7.3.10 When either the Owner or the Contractor or both do not agree concerning the adjustments in the Contract Sum and Contract Time, such dispute shall be resolved in the manner prescribed by Article 4.

§ 7.4 MINOR CHANGES IN THE WORK

§ 7.4.1 The Owner will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly **and the Contractor shall receive no additional compensation therefore, nor shall there be any change in the Contract Time as a result thereof. Otherwise, except in any emergency endangering life or property no extra Work or change shall be made unless a written order from the Owner and/or Architect has been received by the Contractor. No claims for additional changes to the Contract Sum or time of completion shall be valid unless so ordered.**

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

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§ 8.1.3 The date of Substantial Completion is the date certified by the Owner in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective-date of such insurance. Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces, make diligent efforts to keep the Project on schedule and shall achieve Substantial Completion within the Contract Time. Time is of the essence of this Contract.--

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner, or of an employee of the Owner, or of a separate contractor employed by the Owner, or by changes order in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control and not reasonably anticipated by the date of this Contract, or by other causes which the Owner determines may justify delay, then the Contract Time shall be extended by Change Order to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time and if the performance of the Work is not, was not or would not have been delayed by any other cause for which the Contractor is not entitled to an extension in the Contract Time under the Contract Documents. The Contractor further acknowledges and agrees that the adjustments in the Contract Time will be permitted for a delay only to the extent such delay (1) is not caused, or could not have been anticipated, by the Contractor; (2) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay and/or rescheduling or resequencing of Work not on the critical path; (3) is of a duration not less than three days; (4) is grounds for an extension of the Contract Time pursuant to the Contract Documents; and (5) is proven by the Contractor to have actually delayed the critical path of construction.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Section 4.3. **A copy of any claim for extension shall be delivered to the Owner and the Architect and the Contractor shall immediately take all steps reasonably possible to lessen the impact of such delay on Owner.**

§ 8.3.3 Notwithstanding anything to the contrary in the Contract Documents, an extension in the Contract Time, to the extent permitted under Paragraph 8.3.1, shall be the sole remedy of the Contractor for any claim including without limitation any claim or cause of action for (1) delay in the commencement, prosecution or completion of the Work, (2) hindrance or obstruction in the performance of the Work, (3) loss of productivity, (4) unabsorbed overhead, or (5) other similar claims (collectively referred to in this Paragraph 8.3.3 as ADelays@) whether or not such Delays are foreseeable. In no event shall the Contractor be entitled to any compensation or recovery of any damages, in connection with any Delay, including, without limitation, consequential damages, incidental damages, lost profit, lost-opportunity costs, impact damages, lost productivity, unabsorbed overhead or other similar remuneration.

§ 8.3.4. Notwithstanding any provisions of the General Conditions relating to delays and extensions of time, it is understood and agreed that neither the Contractor nor any Subcontractor shall be entitled to any extension of the Contract Time by reason of adverse weather conditions, other than (i) floods, hurricanes, tornadoes, lighting or other like acts of God, or (ii) significantly abnormal weather conditions that are demonstrated to the Owner=s reasonable satisfaction by meteorological records or other means acceptable to the Owner and that have an actual adverse impact on the progress of the Work. Further, no extension of the Contract Time will be granted by reason of labor disputes to the extent that such disputes could reasonably have been avoided by appropriate scheduling of Subcontractors, trades or the like at the Project site, appropriate action for the establishment of multiple gating at the Project site,

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recourse to the NLRB or appropriate judicial action to restrain labor disturbances or other control procedures normally employed by contractors in the management of similar projects in the State of Maryland.

§ 8.3.5. If the Contractor submits a progress report or schedule update indicating, or otherwise expressing an intention to achieve completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.

§ 8.3.6. Should the progress of the Work be delayed or hindered by any fault, neglect, act or omission of the Contractor or any person or firm employed by it, the Contractor shall, at its own cost and expense, work such overtime as may be necessary to make up for all time lost and to avoid delay in completion of the work, and the Contractor further agrees to compensate the Owner for and hold it harmless against any and all costs, expenses, losses, liability and damages which it may sustain or incur by reason of such delay. The Contractor shall submit within ten (10) calendar days of request by the Owner, a recovery schedule indicating how the delay will be remedied. If, in the opinion of the Owner, the progress of the work is unsatisfactory, Owner may, at its discretion, enforce its rights as set forth in subparagraph 3.10.4 including, without limitations, the right to demand that the Contractor perform overtime work or increase its resources to meet the construction schedule at no additional cost to the Owner.--

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 Notwithstanding anything to the contrary contained in the Contract Documents, Owner may withhold payment to the Contractor hereunder if and for so long as Contractor persistently fails to perform any of its obligations hereunder or otherwise in default under any of the Contract Documents; provided, however, that any such holdback shall be limited to an amount sufficient in the reasonable opinion of the Owner to cure any such default or failure of performance by Contractor.

§ 9.2 SCHEDULE OF VALUES

§ 9.2.1 Within five (5) working days after the executed Contract is received by the Contractor, it shall submit a Schedule of Values to the Owner for approval. The Schedule of Values shall be divided in detail sufficient to exhibit areas and/or sections of the Work, and/or by convenient units and shall be updated as required by either the Owner as necessary to reflect (1) description of the Work (listing labor and material separately), (2) total value, (3) percent of the Work completed to date, (4) value of the Work completed to date, (5) percent of previously amount billed, (6) previous amount billed, (7) current percent completed and (8) value of the Work completed to date. Any trade breakdown which fails to include sufficient detail, is unbalanced or exhibits Afront-loading@ of the value of the Work, shall be rejected. This Schedule of Values is intended to facilitate payment by the Contractor to its Subcontractors and once approved, this Schedule of Values becomes the basis for the first payment application request. The first payment application request shall not be valid and payment shall not be due until the Schedule of Values is approved by the Owner.

9.2.1.1 If a trade breakdown and/or the Schedule of Values had been initially approved and subsequently used, but later found improper for any reason, sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (exclusive of normal retainage) to complete the Work.

9.2.1.2 Payments are made upon the approved percentage of work completed for each item in the approved-schedule of values.

9.2.2 Within thirty (30) days of commencement of Work, and thereafter as Owner requests, Contractor shall submit schedules of materials and equipment for each category or Subcontract for which Application for Payment under subparagraph 9.3.2 will be made, which schedules shall include items, quantities, value or unit prices with extensions- and the month in which Application for Payment with respect thereto is expected to occur. Schedules shall be updated on a monthly basis and submitted as an attachment to the Contractor's Application for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Owner an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for in the Contract Documents. **The Application for Payment is to be notarized and stamped with the Contractor's Corporate Seal.** The form of Application for Payment shall be a notarized AIA-Document G702, Application and Certification for Payment, stamped with the Contractor's corporate seal, supported by AIA Document G703, Continuation Sheet. For projects receiving State funding, either fully or in part, the form of the Application for Payment shall be a fully completed and appropriately certified IAC for 306 (series 306.1, 306.2, 306.3 and 306.4). Such Application for Payment shall be certified as correct by Contractor and shall be accompanied by Contractor's Waiver of Liens and the Waivers of Liens and other documentation from subcontractors and suppliers as reasonably may be required by the Owner in form satisfactory to Owner. In addition, such Application for Payment shall contain a certification by Contractor that there are no written claims of mechanic's or materialmen's liens submitted to the Contractor at the date of such Application for Payment, that the Contractor has no knowledge of any filed mechanic's or materialmen's liens with respect to the Work, that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of such Application for Payment, that there is no known basis for the filing of any mechanic's or materialmen's liens on the Work.

§ 9.3.1.1 As provided in Section 7.3.8, such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives but not yet included in Change Orders.

§ 9.3.1.2 Such applications may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.1.3 Each Application for Payment shall be accompanied by a current Contractor's lien waiver and duly executed and acknowledged sworn statement all in form and substance satisfactory to the Owner, showing all Subcontractors and materialmen with whom the Contractor has entered into subcontracts and/or purchase orders, the amount of each such subcontract or purchase order, the amount requested for any Subcontractor and materialmen in the requested progress payment and the amount to be paid to the Contractor from such progress payment, together with similar sworn statements from all such Subcontractors and materialmen;

§ 9.3.1.4 Upon the request of the Owner, any Application for Payment shall be accompanied by duly executed waivers of mechanic's and materialmen's liens and claims from all Subcontractors and, when appropriate, from materialmen and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; and all information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner.

§ 9.3.1.5 With each Application for Payment, the Contractor shall submit monthly Progress Charts comparing the "Work in Place" to the Progress Schedule.

§ 9.3.1.6 Applications for Payment may NOT include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives, but which Construction Change Directives have not been converted to Change Orders.

§ 9.3.2

The Contractor shall submit within thirty (30) days after the date of commencement of the Work, and thereafter as the Owner requires, schedules of materials and equipment for each category or Subcontract for which Application for Payment under Subparagraph 9.3.2 will be made, which schedules shall include items, quantities, value or unit prices with extensions and the month in which Application for Payment with respect thereto is expected to occur. Schedules shall be

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updated on a monthly basis and submitted as an attachment to the Contractor's Application for Payment.

- 9.3.2.1** All materials which are stored off-site shall be segregated from other materials at the storage facility and be tagged for the Owner. Title to such materials shall be vested in the Owner, as evidenced by documentation satisfactory to the Owner. All stored materials shall be secured and handled by the Contractor and/or the supplier with such care so that the Owner's interests are protected. Payment will not be authorized for materials that are not yet fabricated.
- 9.3.2.2** Additionally, the Contractor shall make arrangements for the Owner to physically inspect all on-site and off-site stored materials.
- 9.3.2.3** With each Application for Payment, the Contractor shall submit to the Owner a list identifying each location where materials are stored off the Project site and the value of materials of each location. The Contractor shall provide insurance satisfactory to the Owner for materials stored off the Project in an amount not less than the total value thereof. Representatives of the Owner shall have the right to make inspections of the storage areas at any time.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.3.4 The Owner may require (after the first monthly payment has been made) the Contractor to submit receipted bills from all Subcontractors and materialmen showing they have been paid for their previous month's work and materials.

§ 9.3.5 Until substantial completion, Contractor(s) shall be responsible for all labor, materials and equipment used in performing the work. The Contractor may, at its option, employ a watchman.

§ 9.3.6 Contractor is responsible for payment of Gross Receipts Tax if applicable to this work and must document to Owner that all such taxes have been paid prior to receiving the final release of retainage.

§ 9.4 PAYMENT

§ 9.4.1 The Owner will, within 60 days after receipt of the Contractor's Application for Payment, issue Payment for such amount it determines is properly due. If the Contractor disputes any determination by the Owner with regard to any Application for Payment, the Contractor nevertheless shall expeditiously continue to prosecute the Work.

- 9.4.1.1** A ten (10 %) percent retainage on each monthly statement shall be withheld until project closeout is complete. The retainage accumulated for any particular Construction Phase shall be paid to the Contractor by the Owner at the completion of that Construction Phase the work upon presentation of a complete release of liens and affidavit statement or bond in lieu thereof, and all guarantees and certificates of inspection required.

§ 9.4.2

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1

(Paragraphs deleted)

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 The Owner shall make payment in the manner and within the time provided in the Contract Documents.

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§ 9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. If required by the Owner and its lender, if any, within five (5) days of receipt of payment from the Owner, the Contractor shall send to the Owner copies of checks paid for all items of the Contractor's costs listed in the Application for Payment that were not paid prior to the date on which Application for Payment was submitted. Notwithstanding anything in this Paragraph 9.6.2 to the contrary, the Owner may elect, in the Owner's sole discretion, to make any payment requested by the Contractor on behalf of a subcontractor of any tier jointly payable to the Contractor and such subcontractor. The Contractor and such subcontractor shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint payment be construed to create any (1) contract between the Owner and a subcontractor of any tier, (2) obligations from the Owner to such subcontractor, or (3) rights in such subcontractor against the Owner.

§ 9.6.3

§ 9.6.4 Neither the Owner shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.A A progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

(Paragraphs deleted)

§ 9.6.7 Payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 If, through no fault of the Contractor, the Owner does not pay the Contractor within thirty (30) days of the date established by the Contract Documents for payment, then the Contractor may, upon fourteen (14) additional days written notice to the Owner, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately, but the Contract Sum shall not be adjusted. The Contractor is not entitled recover interest on any unpaid sums.

§ 9.7.2 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make payment due the Owner, or the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 9.7.3 Contractor for themselves, their Subcontractors and third-party Subcontractors, materialmen and employees, covenants and agrees that no mechanics' lien shall be filed or maintained against the building and other improvements which is the subject of the Work and the lot of ground appurtenant thereto for or on account of any work or labor done or materials furnished under the Contract Documents, for which progress payments have been received, and Contractor for themselves, their Subcontractors, materialmen and employees, hereby expressly waives and relinquishes the right to have, file or maintain any mechanics' lien or claim against the building and other improvements or lot of ground appurtenant thereto and covenants and agrees that this Agreement waiving the right of-

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lien shall be for payments received and shall operate and be effective as well with respect to work and labor done and materials furnished under any supplemental agreement or agreements for extra work in connection with the erection and construction of the building and other improvements.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents **and when all required occupancy permits, if any, have been issued**, so that the Owner can occupy or utilize the Work for its intended use provided, however, that as a condition precedent to Substantial Completion, the Owner has received all certifications of occupancy and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof as related to the Work and as necessary for the beneficial occupancy of the Project and/or the relevant Construction Phase thereof.

9.8.1.1 The Contractor shall fully complete the project within thirty (30) working days after Substantial Completion, barring any limitations which are beyond the Contractor's control.

9.8.1.2 The Contractor shall secure and deliver to the Owner written warranties and guarantees from its Subcontractors, Sub-subcontractors, and suppliers bearing the date of Substantial Completion or some other date as may be agreed to by the Owner, and stating the period of warranty as required by the Contract Documents. The Contractor warrants all Work whether performed by it or by its Subcontractors at any tier.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Owner will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Owner to determine Substantial Completion.

9.8.3.1 The Owner or a third-party retained by the Owner will perform no more than one (1) observation to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid by the Owner to any third-party for any additional observations.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Owner will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

Upon substantial completion or occupancy by the Owner, payment shall be accomplished as follows:

- 1. The schedule of values prepared under Paragraph 9.2.1 shall be reviewed and all items 100 percent (100%) complete in accordance with the Specifications shall be billed at 100 percent (100%) with no retainage.**

2. Incomplete items will be billed on the percent of work accomplished and a retainage of five percent (5%) of the line item shall be retained until work is 100 percent (100%) complete.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.4.1.5 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Owner as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor.

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under or pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Owner as part of the final Application for Payment. Final Payment will not be issued until all warranties and guarantees have been received and accepted by the Owner. Except with the consent of the Owner, the Architect will perform no more than one (1) observation to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional observations.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner including the drawings, warranties instructions and maintenance manuals or any other documents with information required to be furnished by Contractor to Owner under this Agreement including, without limitation, the Record Drawings, Specifications, Addenda, Change Orders, and other Modifications maintained at the site pursuant to subparagraph 3.11.1. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

A reasonable sum may be withheld until the Contractor delivers to the Owner Record Drawings, Specifications, Addenda, Change Orders, and other Modifications, maintained at the site, pursuant to Subparagraph 3.11.1 and the warranties, instructions, and maintenance manuals required to be furnished and a final statement of the cost of the Work allocated in accordance with the budget and in a form approved by the Owner's lender.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Owner may retain one and a half (1.5) times the amount estimated to complete unfinished Work or to correct defective Work until all such Work has been satisfactorily completed or corrected. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

If the Owner shall have furnished to the Contractor a Construction Loan Agreement, or similar agreement between the Owner and any lender for the Project, the Contractor agrees fully to cooperate with the Owner in complying with the Owner in complying with the provisions thereof and agrees to furnish any and all information, reports, and certificates, which are required or helpful there under.

§ 9.11 LIQUIDATED DAMAGES

§ 9.11.1 It is agreed that time is of the essence and that Owner will suffer damages if the Work is not completed within the time stated in the Agreement, plus any extension of time granted. The Contractor and the Contractor's Surety shall be liable for and shall pay the Owner, not as a penalty, but as Liquidated Damages for unexcused delay for which Contractor is solely responsible for subsequent lost revenue and cost thereby, the sum of One Thousand Five Hundred Dollars (\$1,500.00) per calendar day as Liquidated Damages for each calendar day of delay until the Work is substantially complete, plus the direct costs incurred by Owner for temporary arrangements, moving and storage for prospective occupants during the time that the Project is not substantially completed after the time stated in the Agreement. For purposes of direct costs incurred by the Owner for temporary arrangements, etc., the parties agree that the Contractor will provide a forecast as to when a Use and Occupancy Permit will be received.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. Contractor shall comply with all applicable laws, ordinances, rules, regulations and order of public authorities having jurisdiction for the safety of persons or property. Contractor shall erect and maintain all safeguards necessary or advisable for safety and protection including, without limitation, fences, railings, barricades, lighting, posting of danger signs and other warnings against hazards. In all instances the Contractor will comply with the more stringent of the applicable code or ordinances and the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America. The Contractor shall be solely responsible for initiating, maintaining and supervising safety precautions and programs in connection with the

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Project. At the request of the Owner, Contractor shall submit to Owner a Safety Plan for the Project outlining all safety measures to be employed on the site.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements thereupon. Any damage to such property or improvements shall be promptly repaired by Contractor at no cost to the Owner. Contractor is responsible for keeping the adjacent public streets, alleys and walks clean from mud, spills and other debris resulting from their operations. Contractor is also responsible for the control of dust resulting from the Work.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. When use or storage of explosives or other hazardous materials or equipment or unusual construction methods are necessary, the Contractor shall give the Owner reasonable advance notice. If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the Contractor shall handle such materials in an appropriate manner and shall defend, indemnify, and hold the Owner harmless from or against all claims, liability, suits, losses and damages arising out of or relating to such materials.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or anyone directly or indirectly employed by the Owner, or by anyone for whose acts the Owner may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner.

§ 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

Contractor shall protect adjoining private or municipal property and shall provide barricades, temporary fences, and covered walkways required to protect the safety of passersby, as required by prudent construction-practice, local building codes, ordinances, or other laws, or the Contract Documents.

Contractor shall maintain Work, materials, and apparatus free from injury or damage from rain, wind, storms, frost, or heat. If adverse weather makes it impossible to continue operations safely in spite of weather

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precautions, the Contractor shall cease Work and notify the Owner and the Architect of such cessation. The Contractor shall not permit open fires on the Project site.

In addition to its other obligations pursuant to this Article 10, the Contractor shall at its sole cost and expense, promptly repair any damage or disturbance to walls, utilities, sidewalks, curbs, and the property of third parties (including municipalities) resulting from the performance of the Work, whether by it or by its Subcontractors at any tier. The Contractor shall maintain streets in good repair and traversable condition.

10.2.8 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from injury by any cause.

§ 10.2.9 The Contractor shall promptly report in writing to the Owner Manager all accidents arising out of or in connection with the Work which cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner. Contractor shall furnish to Owner, within forty-eight (48) hours of any injury, the Contractor's First Report of Accident and the Supervisor's Accident Investigation Report for any accident requiring more than job site first-aid treatment. Final payment will not be made until Contractor certifies that all injuries related to this Contract have been reported to the Construction Manager and further that the Contractor shall hold Architect and Owner harmless for any injuries not so reported.

§ 10.2.10 Contractor agrees that it, its agents, employees and contractors will perform the contractual obligations of Contractor in compliance with applicable regulations issued pursuant to the Construction Safety and Health Act of 1970. If Contractor discovers conditions that constitute potential violations of said regulations by any other party, but which may affect Contractor or its employees, Contractor shall immediately advise Owner thereof; failure to correct such conditions shall justify the withdrawal by Contractor of its employees from the construction site until said conditions are corrected.

§ 10.2.11 Contractor is fully aware of Owner's commitment to safety on this Project and agrees to adhere to and comply with all directives of the Contractor necessary to promote and maintain a safe working environment for all employees of all Contractors. Contractor will conduct regular safety meetings among his own employees and shall furnish Owner with a report of each safety meeting conducted noting as a minimum, the attendees, the subjects discussed and the time and dates of the meetings.

§ 10.2.12 Contractor shall maintain the Work, materials, equipment and apparatus free from injury or damage from rain, wind, storms, frost or heat. If adverse weather, other than heat, makes it impossible to continue operations safely despite weather precautions, the Contractor shall cease work and notify the Owner of the cessation. The Contractor shall not permit open fires on the Project Site.

§ 10.2.13 In addition to its other obligations of the Contract Documents, Contractor shall, at its sole expense, promptly repair any damage or disturbance to walls, utilities, sidewalks, curbs, and the property of third parties (including municipalities) resulting from the performance of the Work, whether by it or by its Subcontractors at any tier. The Contractor shall maintain streets in good repair and traversable condition.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for the safety and health of its employees at all times. The Contractor shall not permit its employees, in the performance of this Contract Agreement, to work in surroundings or under working conditions that are unsanitary, hazardous or dangerous to their safety or health. Contractor's operations must comply with all governmental health or safety requirements and with all lawful health and safety requirements. Contractor shall not create dangerous conditions for others. Contractor shall follow all lawful instruction of the Owner established to prevent injury, loss or damages to persons or property.

§ 10.3.2 Contractor shall not be required to perform any identification, abatement, cleanup, control or removal of asbestos or other hazardous materials not included in the Contractor's Work. However, should Contractor become aware of or suspect the presence of asbestos or other hazardous materials, Contractor shall stop work in the affected area immediately and immediately notify the Owner in writing. In no case shall such immediate written notice exceed 1 business day from the date the Contractor becomes aware or suspects the presence of any hazardous

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material. Should Contractor fail to stop work, the Contractor shall be responsible forsaking all necessary and reasonable steps to contain, control, and abate the asbestos or other hazardous materials in accordance with all applicable statutes and regulations. Contractor agrees to assume full responsibility for any claims arising out of or relating to the disturbance of asbestos or hazardous materials at the site of the Work resulting from the action or inaction of the Contractor. If the Contractor disturbs or otherwise fails to stop work as specified herein, then Contractor shall defend and indemnify the Owner against any and all claims that arise out of Contractor's action or inaction.

§ 10.3.3 In the event that the Work requires Contractor to remove any hazardous materials as defined in 29 C.F.R. Section 1910.1200 et seq. from the Project site, Contractor shall: (1) deliver a Material Safety Data Sheet, "MSDS", as defined and prescribed in 29 C.F.R. section 1910.1200, to Contractor at least ten (10) days before transport of any hazardous substance; (2) furnish Contractor's procedures for disposal of hazardous substances, product residue, by-products, and wastes to the Owner at the time the MSDS are delivered to the Owner; (3) remove, handle and transport any and all hazardous substances in accordance with all applicable local, state, and federal ordinances, statutes, and requirements. In the event that the Work requires the Contractor to remove any hazardous materials, and the Contractor fails to remove, handle and transport any hazardous substances as provided herein, then the Contractor agrees to defend, indemnify and hold the Owner harmless from and against all claims, losses, liabilities, damage and expenses including reasonable attorney's fees and related expenses arising out of or related to bodily injury (including death), property damages, or penalties assessed or asserted, when such injury (including death), property damage, or penalties occur or are assessed as a result of Contractor's failure to remove, handle and transport any and all hazardous substances in accordance with this Contract Agreement, or are incident to Contractor's failure to perform its duties as set forth in this Contract Agreement.

§ 10.4 The Owner shall not be responsible under Section 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.

10.4.1 Hazardous materials such as asbestos, asbestos products, polychlorinated biphenyl (PCB), paints or other coatings containing lead or chromates, or other toxic substances shall not be allowed on the site nor be used in the Work.

10.4.2 The Contractor shall notify the Owner and Architect immediately and stop work in the area affected if any one of the products or materials specified in the Contract Documents or proposed by the Contractor or its subcontractors or material suppliers, contain or are suspected to contain hazardous materials in any form, so that a qualified consultant retained by the Owner can determine whether such materials may be used in the Work or need to be removed from the site or rendered harmless in a manner in which will not adversely affect the health of any persons and which will comply with applicable governmental laws and regulations. Costs of removal to be borne by the Owner.

10.4.3 Work in the affected area shall be resumed in the absence of any hazardous materials or when it has been rendered harmless by written agreement between Contractor and Owner.

§ 10.5

§ 10.6 EMERGENCIES

§ 10.6.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Section 4.3 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall

(Paragraphs deleted)

not commence work under this contract until Contractor has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on its Subcontract until the insurance required of the Subcontractor has been so obtained and approved. If Owner or Owner's Lender or Insurance Carrier requires that the insurance requirements set forth in the Contract

Documents be varied, Contractor agrees to enter into suitable modifications of the provisions hereof, provided Owner bear any additional cost reasonably occasioned thereby.

§ 11.1.2 All insurance policies shall be issued by companies authorized to conduct such business under the laws of the State of Maryland and shall be provided to companies having policyholder ratings no lower than AAA@ and financial ratings not lower than XII in the Best's Insurance Guide, latest edition, in effect at the time of this Agreement and be acceptable to the Owner.

§ 11.1.3 The status of the Contractor in the work to be performed by it under the Contract shall be that of an independent Contractor. As such, Contractor shall properly safeguard against any and all damage, loss or injury, to persons or property that may arise, or be incurred in or during the conduct or progress of said work without regard to whether or not the Contractor, its Subcontractors, agents, or employees have been negligent.

§ 11.1.4 The Contractor shall assume all responsibility for risks or casualties of every description, for any and all damage, loss or injury, to persons or property arising out of the nature of the work; negligence or failure of its employees and Subcontractors to comply with the Contract Documents; arising from action of the elements or from any unforeseen or unusual difficulty. The Contractor shall indemnify and save harmless the Owner, and all of its officers, agents and employees; the Architect and/or Engineer, as named on the plans and specifications, and its partners, agents and employees from all claims, demands and liabilities of any kind whatsoever in connection with work resulting from any acts and/or omissions of the Contractor, its Subcontractors and/or their respective duly authorized servants and/or employees. The Contractor agrees that the foregoing indemnification clause shall be insured under its Commercial General Liability policy, which must be endorsed to include Contractual Liability. If required by the Owner, the Contractor shall produce evidence of insurance coverage or settlement by any such action before payment will be made by Owner.

§ 11.2 Worker's Compensation Insurance

§ 11.2.1 The Contractor shall procure and shall maintain during the life of this Contract Workmen's Compensation Insurance as required by the State of Maryland for all of its employees to be engaged in such work at the site of the project under this Contract and in case any such work is sublet, the Contractor shall require the Subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workmen's Compensation Insurance. The insurance required by this paragraph shall be written for not less than the following limits, or greater if required by law:

Worker's Compensation:

- (a) State: Statutory
- (b) Applicable Federal
(e.g., Longshoremen's): Statutory
- (c) Employer's Liability:
\$500,000 per Accident
\$500,000 per Disease, Policy Limit
\$500,000 per Disease, Each Employee

In case any class of employees engaged in hazardous work on the project under this Contract is not protected under Workmen's Compensation Statute, the Contractor shall provide and shall cause such Subcontractor to provide adequate employer's liability insurance for the protection of such of its employees are not otherwise protected. The insurance referred to in this paragraph contain provisions waiving underwriters' rights of subrogation against the Owner.

§ 11.3 Contractors Commercial General Liability Insurance and Automobile Liability Insurance

§ 11.3.1 The Contractor's Commercial General Liability (CGL) shall be in an amount acceptable to the Owner but not less than \$1,000,000 Combined Single Limit per occurrence and \$2,000,000 annual aggregate per project (ISO

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endorsement CL 344-11/85). The Owner must be named as an additional named insured. The coverage must include:-

- Commercial Form
- Premises/Operations (including X, C and U coverages as applicable)
- Underground, Explosions, and Collapse Hazard (if excavation, blasting, tunneling, demolition or rebuilding of any structural support of a building is involved or explosion hazard exists).
- Products/Completed Operations
- Contractual Liability Insurance including specified provision for Contractor=s obligations under Paragraph 3.18
- Independent Contractors Protective (if any part of the Work is to be subcontracted)
- Broad Form Property Damage including completed operations
- Personal Injury with Employment Exclusion deleted
- Cross-Liability Coverage
- Owned, non-owned, and hired rental vehicles

§ 11.3.2 Contractor shall maintain products/completed operations coverage with a combined single limit no less than \$1,000,000 per occurrence of bodily injury/property damage for a period of at least thirty-six (36) months following final acceptance of Contractor's work by Owner.

§ 11.3.3 The Contractor's Commercial automobile Liability insurance must provide coverage for owned, non-owned, and hired vehicles and trailers used in connection therewith, with a combined single limit for bodily injury and property damage no less than \$1,000,000 per occurrence, with the Owner named as additional insured.

§ 11.3.4 The insurance required herein and approval of Contractor's insurance by Owner shall not relieve or decrease the liability of the Contractor hereunder.

§ 11.4 Subcontractor's Commercial General Liability Insurance and Vehicle Liability Insurance

§ 11.4.1 The Contractor shall either (1) require each of its Subcontractors to procure and to maintain during the life of its subcontract, Commercial General Liability Insurance and Vehicle Liability Insurance of the type and in the amounts specified in Sub-Paragraph 11.3 hereof, or; (2) to insure the activities of its Subcontractors in its policy, as specified in Sub-Paragraph 11.3 hereof.

§ 11.5 Umbrella Excess Liability Insurance

§ 11.5.1 Contractor shall maintain umbrella excess coverage over the other primary insurance coverages; this umbrella excess liability insurance shall have a combined single limit no less than \$10,000,000.

§ 11.6 Scope of Insurance and Special Hazards

§ 11.6.1 The insurance required under Sub-Paragraph 11.3 and 11.4 hereof is a minimum to provide adequate protection for the Contractor and its Subcontractors, respectively, against damage claims which may arise from operations under this Contract, whether such operation be by the insured or by anyone directly or indirectly employed by the insured and, also against any of the special hazards which may be encountered in the performance of this Contract.

§ 11.7 Proof of Carriage of Insurance

§ 11.7.1 The Contractor shall deliver to the Owner, within ten (10) days of the date of this Agreement and prior to any equipment or personnel being brought on to the site of the work, certificates of insurance with, where appropriate, permission of the Owner to occupy, showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. **The certificates must indicate that the Owner is included as an additional named insured.** Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ninety (90) days written notice has been received by the Owner." The coverage afforded under any insurance policy obtained under or pursuant to this Paragraph 11 shall be primary to any valid and collectible insurance carried separately by any of the Indemnitees. Any aggregate limit under the Contractor=s liability insurance shall, by endorsement, apply to this Project separately. All Certificates of Insurance and duplicate policies shall contain the following clauses:

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§ 11.7.1.1 Contractor shall have no right of recovery or subrogation against the Owner (including its agents and agencies as aforesaid), it being the intention of the parties that the insurance policy so effected shall protect both parties in the primary coverage for any and all losses covered by the above-desired insurance.

§ 11.7.1.2 The clause 'Other Insurance Provision' in the policy or policies shall have no recourse against the Owner for payment of any premiums or for assessments under any form of policy.

§ 11.7.1.3 The insurance companies issuing the policy or policies shall have no recourse against the Owner for payment of any premiums or for assessments under any form of policy.

§ 11.7.1.4 Any and all deductibles in the above-described insurance policies shall be assumed by and before the account of and at the sole risk of the Contractor.

§ 11.7.2 Contractor shall provide certified copies of any or all required insurance policies on request of Owner.

§ 11.8 Renewal Requirements

§ 11.8.1 If any of the property or casualty insurance requirements are not complied with at their renewal dates, payments to the Contractor will be withheld until those requirements have been met or, at the option of the Owner, Owner may pay the applicable premiums and withhold such payment from any monies due the Contractor.

§ 11.9 Claims

§ 11.9.1 In the event that claims in excess of the insured amounts provided are filed by reason of any operations under the services provided by the Contractor, the amount of excess of such claims, or any portion thereof, may be withheld from payment due until such time as the Contractor shall furnish such additional security covering such claims as may be determined by the Owner.

§ 11.10 Property Insurance Assumption of Risks and Waivers

§ 11.10.1 During performance of the Work, the Owner shall, for its benefit and the benefit of the Contractor and all tiers of Subcontractors, as their respective interests may appear, provide Builders "All Risk" insurance for Work performed at the Project site against direct physical loss of or damage to the Project, and machinery and equipment to be incorporated therein (subject to normal exclusions), on a replacement cost basis. Such insurance does not apply to the Contractor's materials, supplies, machinery and equipment until delivered to the Project site.

§ 11.10.2 Coverage does not apply to real or personal property which is owned by or leased to, or otherwise under the care, custody and control of the Contractor or any tier Subcontractor and which is not a part of, or to be incorporated into, the Work or Project and shall not cover, without any limitation, any tools, apparatus, machinery, scaffolding, hoists, forms, staging, shoring and other similar items commonly referred to as construction equipment, which may be on the site and the capital value of which is not included in the Work. The Owner does not assume any liability for loss or damage to such property.

§ 11.10.3 The Contractor agrees that it has the risk of loss and will repair or replace any loss or damage to the Work occurring prior to its final acceptance.

§ 11.10.4 The Contractor waives all rights of recovery against the Owner for physical loss or damage to the Work. The Contractor will cause the underwriters of any insurance maintained by it covering loss or damage to the Work to likewise waive its rights of subrogation against the Owner. Such waivers by the Owner apply only to such loss or damage occurring prior to final acceptance of the Project. The Owner will cause the underwriters of policies to waive their rights of subrogation against the Contractor and all tiers of Subcontractors to the same extent herein that the Owner has waived its rights of recovery.

§ 11.10.5 The above provisions apply with respect to each occurrence of loss or damage and only to such loss or damage, which is covered, or but for the deductible would be covered, under the Builders "All Risk" Insurance.

§ 11.11 Owner's Project Loss of Use Waiver

§ 11.11.1 Owner waives its right of recovery against Contractor and all tiers of Subcontractors for loss of use of the Project to the extent such loss of use rises out of direct physical loss or damage to the Project and such loss of use is covered, or but for the deductible would be covered, under Owner's Fire and Extended Coverage (Business Interruption) Insurance or Owner's Difference-In-Conditions (Business Interruption) Insurance to the extent (1) of actual recovery of any insurance proceeds under policies obtained pursuant to this Paragraph 11.10.1 and (2) permitted by the applicable policies of insurance. Such waiver does not apply to loss of use arising out of physical loss or damage to the Project occurring subsequent to the completion of the Project and its final acceptance by the Owner. Owner will cause underwriters of such policies of insurance to waive their rights of subrogation against Contractor and all tiers of Subcontractors to the same extent herein that Owner has waived its rights of recovery against Contractor and such Subcontractors.

§ 11.12 Contractor's Assumption of Risks, Property Insurance, Waivers and Requirements of Subcontractors.--

§ 11.12.1 The Contractor assumes, at its sole cost and expense, all risks or loss damage to all real and personal property, owned or leased by it or otherwise in its care, custody or control, which is not part of the Work or the Project, and waives all rights or recovery against the Owner for loss or damage to, and for loss of use of, such property. The Contractor will cause the underwriters of any insurance, maintained by the Contractor and covering loss or damage to, or loss of use of, such property to likewise waive their rights of subrogation against the Owner.

§ 11.12.2 The Contractor shall require all tiers of Subcontractors to likewise waive their rights of recovery and cause their underwriters, if any, to waive rights of subrogation, against the Owner for loss or damage to the Project, and for loss or damage to, including loss of use of, all real and personal property which is not part of the Work or Project and which is owned or leased by such Subcontractors, or which is otherwise in their care, custody or control.

§ 11.13 Law, Rules and Regulations.

§ 11.13.1 The Contractor shall comply with all laws, rules and regulations of the State and County and/or local authorities having jurisdiction, as may be applicable affecting the work under this contract, especially the following:

- A. Licenses
Each Contractor and Subcontractor shall be licensed to do business in the State of Maryland and shall pay all fees and taxes due under State Laws.
- B. Taxes
All Contractors and Subcontractors shall pay all sales, consumer, use and other taxes as required of them by law.
- C. Equal Opportunity Employment
During the performance of this contract the Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, sex or national origin. The Contractor shall take affirmative action to ensure that applicants are employed and that employees are treated equally during employment without regard to their race, creed, color, sex or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, promotion 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, the Applicants for Employment notices to be provided by the Contracting Agency, setting forth this non-discrimination clause.

The Contractor will state that all qualified applications will receive consideration for employment without regard to race, color, creed, sex or national origin, in all solicitations or advertisements for employees placed by or on his behalf.

(Paragraphs deleted)

Init.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Owner's request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Owner, **the Owner, or any governmental authority** be uncovered for **their** examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered which the **Owner, or any governmental authority** has not specifically requested to examine prior to its being covered, the Owner may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

§ 12.2.1.1 The Contractor shall promptly correct Work rejected by the Owner, or any governmental authority or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections and expenses made necessary thereby, shall be at the Contractor's expense.

12.2.1.2 The Contractor's obligations of Paragraph 12.2 shall cover any repairs and replacement to any part of the Work or other property caused by the defective Work. Upon completion of any Work under or pursuant to this Paragraph 12.2., the one (1) year correction period in connection with the Work requiring correction shall be renewed and recommence.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 Contractor and its Surety shall have the right to remedy any defects in the Work or materials which shall appear within a period of one (1) year from the date of Substantial Completion upon written notice from the Owner. The Contractor and Surety shall provide said remedy within fourteen (14) days after notice from the Owner. If said remedy is not timely provided, the Owner shall have the right to correct said defects and charge the Contractor and its-Surety for the same.

Fourteen (14) calendar days is to be considered as a reasonable time for correcting any single major item of conforming work. Thirty (30) calendar days is to be considered as a reasonable time for correcting punch list items.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract

Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

Generally, guarantee shall cover the following:

- i. Defective material or workmanship**
- ii. Defective equipment; further operation and performance of equipment in satisfactory, efficient, and economical manner and in accordance with Contract.**
- iii. Damage to or unusual wear to deterioration of material or equipment while being used normally or as specified.**
- iv. Guaranteed work which does not meet Contract performance requirements – replaced or corrected as directed.**

In addition to above guarantee, furnish to Architect bonds, and/or guarantees required under any trade Division of Specifications. Such guarantee shall cover scope (where applicable) required for Contractor's guarantee and other requirements set forth in respective Division. Guarantee shall be in duplicate and in form satisfactory to Architect.

No certificate issued, payment made, or provision of Contract shall be used to relieve Contractor of responsibility under guarantee. No requirements of Drawings or Specifications, previous approvals, or inspections, time lapse or extension, or weather, shall relieve Contractor of responsibility under guarantee. If Contractor has good and sufficient reason to question sufficiency strength quality, use, design capacity, etc., of any material equipment system, etc. the Architect must be notified in writing at earliest date, before performing Work. Any Work so questioned by Contractor shall be investigated by the Architect and either changed so that in the opinion of the Architect Work can be executed for guarantee to fully apply, or that the Contractor be advised that Work as shown or specified will not be changed and guarantee will be in full effect.

If, in fulfilling any guarantee, the Contractor disturbs or damages other work, restoration must be made of such work to its original condition.

All bonds and written guarantees shall be approved by the Architect before a "Certificate of Final Payment" will be issued.

Work shall be guaranteed for a period of two (2) years from date of final acceptance of the subject construction phase, Major equipment provided under this Contract shall be guaranteed for a period of two (2) years form date of beneficial use of that equipment by the Owner unless otherwise specified in the Contract Documents.

§ 12.2.2.6 Work shall be guaranteed for a period of two (2) years from date of final acceptance of the subject construction phase. Major equipment provided under this Contract shall be guaranteed for a period of two (2) years from the date of beneficial use of that equipment by the Owner unless otherwise specified in the Contract Documents.--

§ 12.2.2.7 No certificate issued, payment made, Owner action or inaction, or provision of the Contract Documents shall be used to relieve Contractor of responsibility under the guarantee.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

§ 12.3.1 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

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ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

§ 13.1.1 The Contract shall be governed by the law of the place where the Project is located.

Historical lack of enforcement of any local law shall not constitute a waiver of Contractor's responsibility for compliance with such law in a manner consistent with the Contract Documents unless and until the Contractor has received written consent for the waiver of such compliance from the Owner and the agency responsible for the local law enforcement.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. **Contractor may not assign its rights or obligations under this Contract. Owner may assign its rights and obligations hereunder to its lender, if any, and Contractor agrees to enter into an agreement with such lender pursuant to which, at such lender's request, Contractor will complete the Work upon appropriate provision for payment of the balance of the Contract Sum.** If the Contractor attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2

§ 13.3 WRITTEN NOTICE

§ 13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice. **At Owner's request, a copy of all written notices by the Contractor to the Owner shall be delivered to the lender for the Project, if any.**

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Except as expressly provided in the Contract Documents duties and obligations imposed by the Contract Documents and rights and remedies available there under shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing. **The invalidity of any part of provision of the Contract Documents shall not impair or affect in any manner the validity, enforceability, or effect of the remaining parts and provision of the Contract Documents.**

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense, including the cost of retesting for verification of compliance, if necessary, until the Architect certifies that the Work in question does comply with the requirements of the Contract Documents. The Contractor also agrees that the cost of testing services required for the convenience of the Contractor in his scheduling and performance of the Work, and the cost of testing services related to remedial operations performed to correct deficiencies in the Work shall be borne by the Contractor.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

§ 13.6.1

In no event shall any interests be due and payable by the Owner to the Contractor, any Subcontractors, or any other party on any of the sums payable by the Owner under this Contract, including without limitation, the sum which the Owner is authorized to retain pursuant to the Contract Documents.

§ 13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

§ 13.7.1 As between the Owner and Contractor:

- .1 Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;
- .2 Between Substantial Completion and Final Certificate for Payment. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and
- .3 After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

Notwithstanding any provision of Subparagraph 13.7.1 to the contrary, no applicable statute of limitations shall be deemed to have commenced with respect to any portion of the Work which is not in accordance with the requirements of the Contract Documents, which would not be visible or apparent upon conducting a reasonable investigation, and which is not discovered by the Owner until after date which, but for this Subparagraph 13.7.2 would be the date of commencement of the applicable statute of limitations; the applicable statute of limitations instead shall be deemed to have commenced on the date of such discovery by the Owner.

§ 13.8 EQUAL OPPORTUNITY

By entering into an agreement, Contractor(s) agrees as follows:

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§ 13.8.1 Contractor(s) and Contractor's Subcontractors shall not discriminate against any employees or applicant for employment because of race, religion, color, sex, national or ethnic origin, age, handicap or veteran's status. Contractor(s) will take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, sex, national or ethnic origin, age, handicap, or veteran's status. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, and selection for training, including apprenticeship. Contractor(s) agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by an appropriate agency of the Federal Government setting forth the requirements of this Equal Opportunity Clause.

§ 13.8.2 Contractor(s) shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national or ethnic origin, age, handicap, or veteran's status.

§ 13.9 - GENERAL PROVISIONS

§ 13.9.1 All personal pronouns used in this Contract, whether used in the masculine, feminine, or neuter gender, shall include all other genders; and the singular shall include the plural and vice versa. Titles of articles, paragraphs, and subparagraphs are for convenience only, and neither limit nor amplify the provisions of this Contract in itself. The use herein of the word *including* when following any general statement, term, or matter, shall not be construed to limit such statement, term, or matter to the specific items or matters set forth immediately following such word or to similar items or matters, whether or not non-limiting language (such words as *without limitation* or *but not limited to* or words of similar import) is used in reference thereto, but rather shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such general statement, term or matter.

§ 13.9.2 Whenever possible, each provision of this Agreement shall be interpreted in a manner as to be effective and valid under applicable law. If, however, any provision of this Agreement, or portion thereof, is prohibited by law or found invalid under any law, only such provision or portion thereof shall be ineffective, without in any manner invalidating or affecting the remaining provisions of this Agreement or valid portions of such provision, which are hereby deemed severable.

§ 13.9.3 Each party hereto agrees to do all acts and things and make, execute and deliver such written instruments, as shall from time to time be reasonably required to carry out the terms and provisions of the Contract Documents.

§ 13.9.4 Any specific requirement in this Contract that is the responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and are also hereby deemed to include a Subcontractor of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate or limit any responsibilities or obligations of a Subcontractor of any tier under the Contract Documents or the applicable subcontract.

§ 13.8.5 Unless specifically noted to the contrary elsewhere within this Agreement, all reference to a number of days shall clearly be understood to indicate calendar days.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped;
- .2 an act of government, such as a declaration of national emergency which requires all Work to be stopped;

(Paragraphs deleted)

§ 14.1.2

§ 14.1.3 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon fourteen days written notice to the Owner, terminate the Contract and recover from the Owner payment for Work executed only.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has persistently failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon fourteen additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

The Contractor agrees that the Contractor does not have a right to terminate for convenience.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

- .1 persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction;
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.
- .5 breaches any warranty made by the Contractor under or pursuant to the Contract documents;
- .6 Contractor becomes insolvent or makes a general assignment for the benefit of its creditors;
- .7 the Contractor's corporate charter is forfeited, revoked or dissolved or if Contractor fails to maintain any other license or permit required in the prosecution of the Work;
- .8 fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with all the requirements of the Contract documents; or
- .9 fails after commencement of the Work to proceed continuously with the construction and completion of the Work for more than ten (10) days, except as permitted under the Contract documents.

§ 14.2.2 When any of the above reasons exist, the Owner, , may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 accept assignment of subcontracts pursuant to Section 5.4; and
- .3 finish the Work by whatever reasonable method the Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.
- .5 Notwithstanding any other provision contained in this Contract, and superseding any contrary term expressed herein, Contractor agrees that if in the event of any strike, picket, sympathy strike, work stoppage, or other form or labor dispute at the jobsite, whether that dispute or picket is in connection with the Owner, the CM, the Contractor or any other Contractor or separate Contractor on the jobsite, Contractor will continue to perform the Contractor's Work required herein without interruption or delay. In the event the Contractor fails to continue the performance of the Contractor's Work included herein, without interruption or delay, because of such picket or other form of labor dispute, the Owner may terminate the services of Contractor after giving twenty-four (24) hours written notice of an intent to do so. Additionally, should the Contractor be party to one or more labor agreements, he shall take all reasonable action to avoid any work stoppage and, in the event a work stoppage should occur, he shall, within twenty-four (24) hours, take any and all legal action provided for, or permitted by, such labor agreements in order to expedite resumption of work on this Project. It is contemplated hereby that Contractor shall, if necessary, utilize to the fullest extent possible, all contractual provisions contained in Contractor's labor agreements which allow for the hiring of replacement employees, should the hiring hall of the Contractor be unable or unwilling to meet the needs of the Contractor.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

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§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Architect, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. No adjustment shall be made to the extent:

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2

(Paragraphs deleted)

In the event Owner terminates the Contract for convenience, the parties agree that the provisions of this Contract which would, by their nature, survive final acceptance of the Work described and required by the Contract Documents shall remain in full force and effect after any termination for convenience. Upon termination, the obligations of the Contract, including without limitation all warranties, shall continue as to portions of the Work already performed and as to bona fide obligations assumed by the Contractor prior to the date of termination.

§ 14.4.3 In the event of such a termination, the Contractor waives any and all claims for damages, including but not limited to anticipated profits, overhead, mark ups, and/or payroll reimbursements. Contractor's sole right and remedy for a termination for convenience is payment of the actual cost of all Work properly performed by the Contractor prior to the date of termination. The Contractor further agrees that it will only be entitled to payment for work not previously paid in other progress payments received by the Contractor. If at the date of termination, Contractor has properly prepared or fabricated off the site any goods for subsequent incorporation into the Work, and if the Contractor delivers those goods to the site or to such other place as the Owner shall reasonably direct, then the Contractor shall also be entitled to payment for such goods and materials.

ARTICLE 15 – SUPPLEMENTARY PROVISIONS

§ 15.1 NOTICE OF REQUIREMENT FOR CERTIFICATION OF NON-SEGREGATED FACILITIES

15.1.1 Bidders are cautioned as follows: By signing of this bid, the bidder will be deemed to have signed and agreed to the provisions of the Certification of Non-Segregated Facilities in this solicitation. The Certification provides that the bidder does not maintain or provide for his employees facilities which are segregated on a basis of race, creed, color, or national origin, whether such facilities which are segregated are by directive or on a de facto basis. The Certification also provide that he will not maintain such segregated facilities. Failure of a bidder to agree to the Certification of Non-Segregated Facilities will render his bid non-responsive to the terms of solicitation involving awards of contracts exceeding \$10,000 which are not exempt from the provision of the Equal Opportunity Clause.

§ 15.2 RIGHT TO REMOVE PERSONS FROM THE JOB

15.2.1 The Architect shall have the right to order the Contractor to remove or have removed from the job site any person or persons considered arbitrary and obnoxious or incompetent by the Architect.

§ 15.3 GENERAL INCLUSIVENESS SPECIFICATIONS

15.3.1 In every instance, unless specified otherwise, the Contractor shall furnish all material or equipment indicated or specified; that is, shall be installed complete by Contractor, and if necessary for its use, it shall be hooked up, interconnected, made operational and tested by Contractor. All work incidental to or made necessary by any of the foregoing shall be included and performed by Contractor.

15.3.2 In every instance, unless specified otherwise, the Contractor shall furnish all materials, labor, equipment, plant, tools, scaffolding, protection, etc., to do, perform and complete each and every item of Work as indicated by Drawings or reasonably implied therein, including all handling, hauling, transportation, fees, taxes, insurance, licenses, permits, etc., and all Work and expenses incidental to or caused by any part of the foregoing or of Work required to make the Project complete and ready for full and satisfactory use, occupancy and operations, as required by Contract. Foregoing applies to all those contracting for work on the project; and all so involved shall perform their work well faithfully and completely to the true intent of the Contract.

§ 15.4 SPECIAL MATERIAL REQUIREMENT

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- 15.4.1 Asbestos Clause – If any existing asbestos is found during the course of Work, after asbestos abatement for that construction phase has been complete, the Owner is to be notified immediately.
- 15.4.2 Contractor shall submit Material Safety Data Sheets (MSDS) for all permanent materials incorporated into the building in accordance with OSHA Hazard Communication Standard 92 CRF S 19101200. Examples are Freon, chloride compounds for domestic water sterilization and regulation. Asbestos containing materials will not be approved for use in the school building.
- 15.4.3 No asbestos containing materials as defined in the AHERA Act of 1986 are to be installed under this Contract.

§ 15.5 SUBSTANTIAL COMPLETION

- 15.5.1 Upon receipt of written notice from the Contractor that the Project is ready for substantial completion inspection, Architect will promptly make such inspection and prepare a "punch list". When all items on the punch list are completed, Project will be considered substantially completed.
- 15.5.2 However, should come items on the punch list be unavoidably not completed, the Architect, at his discretion, may consider the Project as substantially completed, provided the building can be conveniently occupied by the Owner.

§ 15.6 EMPLOYMENT PRACTICES

- 15.6.1 The Owner may occupy parts of the Project on site and store and install equipment, furniture, etc., prior to final completion of Occupancy. Occupancy shall not unduly interfere with the Contractor's work. The Contractor shall cooperate in making storage space available when required.
- 15.6.2 Occupancy shall not be considered acceptance, nor is it to signify completion of any part of the Work.
- 15.6.3 The Contractor shall furnish all temporary and final occupancy permits to the Owner.

§ 15.7 EMPLOYMENT PRACTICES

- 15.7.1 The Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, color or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, rates of pay, or other forms of compensation, and selection for training include apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notices to be provided by the Owner, setting forth the provisions of the nondiscrimination clause.
- 15.7.2 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 consideration for employment without regard to race, creed, color or national origin.

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- 15.7.3 The Contractor shall 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 by the Owner, advising the said labor union or workers' representative of the Contractor's commitments under this Division, and shall post copies of the notice in conspicuous places available for employment.
- 15.7.4 The Contractor shall furnish, if requested by the Board of Education of Baltimore County, a compliance report concerning his employment practices and policies in order for the Board of Education of Baltimore County to ascertain compliance with the special provisions of this Contract concerning nondiscrimination in employment.
- 15.7.5 In the event of the Contractor's noncompliance with the nondiscrimination clause of this Contract, this Contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Board of Education of Baltimore County work.
- 15.7.6 The Contractor shall include the special provisions outlined herein pertaining to nondiscrimination in employment in every subcontract or purchase order utilized by him in order to carry out the terms and conditions of this Contract so that such discrimination in employment provision shall be binding on each Subcontractor or vendor.

§ 15.8 MARYLAND SALES TAX

- 15.8.1 Materials which are incorporated into the Work under this Contract ARE SUBJECT TO THE MARYLAND-SALES OR USE TAX.

§ 15.9 BALTIMORE COUNTY BUILDING INSPECTORS

- 15.9.1 The Contractor's attention is called to the fact that Baltimore County Building Inspectors will inspect Board of Education of Baltimore County building for conformity to all applicable codes.
- 15.9.2 The Contractor shall follow the Baltimore County inspection procedures for requesting inspection of layout, footings, framing, and all other applicable Work.

15.10 HOLIDAY AND WEEKEND WORK

- 15.10.1 Should the Contractor elect to work on recognized holidays and weekend, he shall notify the Owner at least four (4) days prior to such day(s) of his intent to do so.
- 15.10.2 No work can be performed in the existing building without the presence of a school custodian or other Owner representative. The Contractor will be responsible to pay all costs for a custodian to be present.

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SECTION 00800 - SUPPLEMENTARY CONDITIONS

PART A - CONDITIONS OF THE CONTRACT

The following supplements modify, delete from, or add to, the AIA A201 General Conditions of the Contract for Construction, 1997 edition. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered provisions of the Article, Paragraph, Subparagraph, or Clause of the General Conditions shall remain in effect.

ARTICLE 2 OWNER

2.2.5 Delete – The Contractor will be furnished free of charge eight (8) copies of the Drawings, Specifications and Project Manual. Additional copies will be furnished upon payment by Contractor of the cost or reproduction, postage and handling.

Insert – The Contractor with whom the Owner shall enter into a Contract shall be entitled to receive without charge **five (5)** sets of Contract Documents, Drawings, Specifications (Project Manual) and all addenda. The Contractor must request the **five (5)** sets of Documents from BCPS Office of Engineering and Construction in writing **after** receipt of the Notice to Proceed (NTP). Additional sets of Contract Documents or any parts thereof may be purchased by the Contractor(s) from Gardens Reprographics.

ARTICLE 3 CONTRACTOR

3.7.1 Change the first line to read: “Unless otherwise provided in the Contract documents, the Owner shall obtain the building permit and the Contractor shall secure and pay for all other permits and governmental fees, licenses, and inspections necessary for...”

3.8 Allowances

3.8.1 The Contractor shall include in the Contract Sum and Alternate(s) as indicated, allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as indicated in the Contract Documents or as the Owner may direct.

3.8.2 Unless otherwise provided in the Contract Documents,

3.8.2.1 allowances shall cover the cost to the Contractor of materials, equipment and installation of the item(s) at the site including all required taxes, delivery costs, less applicable trade discounts;

3.8.2.2 payment for allowances shall be indicated on monthly requisitions as a line item with appropriate supporting documentation of the requested amount. Allowances are NOT

subject to Contractor O & P, insurance or bonding costs as these items are part of the Contract Sum;

3.8.2.3 upon conclusion of the project, remaining allowances will be deducted from the contract by a credit Change Order. The Contractor may retain a sum of three percent (3%) of the credit for handling;

3.8.2.4 should an allowance item exceed the allowance provided in the Contract Documents, the Contract Sum shall be adjusted accordingly by Change Order.

ARTICLE 9 PAYMENT AND COMPLETION

9.3.2 Delete the last sentence of the first paragraph and replace with the following:

“Payment for materials and/or equipment stored on, or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner’s title to such material and/or equipment, or otherwise protect the Owner’s interest.

The following conditions shall also be required for payment for materials and/or equipment stored off the site:

1. The Contractor shall provide proof of payment and release of liens for stored materials and/or equipment.
2. The Contractor shall provide proof of insurance for stored materials and/or equipment naming BCPS as beneficiary.
3. Payment for materials and/or equipment shall not exceed the cost of the materials and/or equipment less the cost of insurance, storage and transportation to the site for such material and/or equipment.”

9.6.1 Add the following:

“Retainage shall be 5% of the total Application for Payment request and shall remain at 5% through the duration of the project.”

9.11 Delete: Liquidated Damages paragraph entirely.

Note: Liquidated Damages as state in Section 00200 shall apply to this project.

ARTICLE 11 INSURANCE AND BONDS

11.3.2 Delete phrase: “...at least thirty-six months...”

Replace phrase with: “...at least twenty-four months...”

Add the following: 11.3.5 "Contractor shall maintain pollution liability insurance with a minimum limit of \$1,000,000.00 per occurrence and a general aggregate limit of \$1,000,000.00."

ARTICLE 15 SUPPLEMENTARY PROVISIONS

15.10 Holiday and Weekend Work:

15.10.1 Should the Contractor elect to work on recognized holidays and weekends, he shall notify the Owner at least four (4) days prior to such day(s) of his intent to do so.

15.10.2 No work can be performed in the existing building without the presence of a school custodian or other owner representative. The Contractor will be responsible to pay all costs for a custodian to be present.

END OF SECTION 00800

SECTION 00850 – State of Maryland Prevailing Wage Rates (*State funded version*)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. This project is subject to State Prevailing Wage Rates. The following pages are State of Maryland trade wage rates for this specific project.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00850



STATE OF MARYLAND

**DEPARTMENT OF LABOR, LICENSING AND REGULATION
DIVISION OF LABOR AND INDUSTRY
PREVAILING WAGE SECTION
1100 N. Eutaw Street, Room 607
Baltimore, MD 21201
(410) 767-2342**

08/29/2016

REQUEST FOR ADVERTISEMENT AND NOTICE TO PROCEED

Anita Randall - Procurement Officer
BCPS
6901 Charles Street, Building E
Towson, MD 21204

**Re: Replacement School - Victory Villa Elementary School
Project No: ARA-209-17**

Enclosed please find the Prevailing Wage Determination and Instructions for Contractors for the project referenced above.

Upon advertisement for bid or proposal of this project, you are requested to submit to this office the date and name of publication in which such advertisement appeared.

Once awarded, you are further directed to submit to this office, the NOTICE TO PROCEED for the project, complete with the date of notice, the name of the general contractor, and the dollar amount of the project. In addition, we ask that a representative of the prevailing wage Unit be invited to attend the Pre-Construction Conference.

Any questions concerning this matter may be referred to PrevailingWage@dllr.state.md.us

Sincerely,

Enclosures
Wage Determination
Instruction for the Contractor

Prevailing Wage Unit

PREVAILING WAGE INSTRUCTIONS FOR THE CONTRACTOR & SUBCONTRACTOR

The contractor shall electronically submit completed copies of certified payroll records to the Commissioner of Labor & Industry, Prevailing Wage Unit by going on-line to <https://www.dllr.state.md.us/prevwage> and following the instructions for submitting payroll information (NOTE: A contractor must register prior to submitting on-line certified payroll information).

If you have technical questions regarding electronic submittal, contact the Department at prevailingwage@dllr.state.md.us.

All certified payroll records shall have an accurate week beginning and ending date. The contractor shall be responsible for certifying and submitting to the Commissioner of Labor and Industry, Prevailing Wage Unit all of their subcontractors' payroll records covering work performed directly at the work site. By certifying the payroll records, the contractor is attesting to the fact that the wage rates contained in the payroll records are not less than those established by the Commissioner as set forth in the contract, the classification set forth for each worker or apprentice conforms with the work performed, and the contractor or subcontractor has complied with the provisions of the law.

A contractor or subcontractor may make deductions that are (1) required by law; (2) required by a collective bargaining agreement between a bona fide labor organization and the contractor or subcontractor; or (3) contained in a written agreement between an employee and an employer undertaken at the beginning of employment, if the agreement is submitted by the employer to the public body awarding the public work and is approved by the public body as fair and reasonable.

A contractor or subcontractor is required to submit information on-line on their fringe benefit packages including a list of fringe benefits for each craft employed by the contractor or subcontractor, by benefit and hourly amount. Where fringe benefits are paid in cash to the employee or to an approved plan, fund, or program, the contribution is required to be indicated.

Payroll records must be electronically submitted and received within 14 calendar days after the end of each payroll period. If the contractor is delinquent in submitting payroll records, processing of partial payment estimates may be held in abeyance pending receipt of the records. In addition, if the contractor is delinquent in submitting the payroll records, the contractor shall be liable to the contracting public body for liquidated damages. The liquidated damages are \$10.00 for each calendar day the records are late.

Only apprentices registered with the Maryland Apprenticeship and Training Council shall be employed on prevailing wage projects. Apprentices shall be paid a percentage of the determined journey person's wage for the specific craft.

Overtime rates shall be paid by the contractor and any subcontractors under its contracts and agreements with their employees which in no event shall be less than time and one-half the prevailing hourly rate of wages for all hours worked in excess of ten (10) hours in any one calendar day; in excess of forty (40) hours per workweek; and work performed on Sundays and legal holidays.

Contractors and subcontractors employing a classification of worker for which a wage rate was not issued SHALL notify the Commissioner of Labor & Industry, Prevailing Wage Unit, for the purpose of obtaining the wage rate for said classification PRIOR TO BEING EMPLOYED on the project. To obtain a prevailing wage rate which was NOT listed on the Wage Determination, a contractor or subcontractor can look on the DLLR webpage under prevailing wage.

Contractors and subcontractors shall maintain a valid copy of proper State and county licenses that permit the contractor and a subcontractor to perform construction work in the State of Maryland. These licenses must be retained at the worksite and available for review upon request by the Commissioner of Labor and Industry's designee.

**Each contractor under a public work contract subject to Section 17-219 shall:

1. Post a clearly legible statement of each prevailing wage rate to be paid under the public work contract; and
2. Keep the statement posted during the full time that any employee is employed on the public work contract.
3. The statement of prevailing wage rates shall be posted in a prominent and easily accessible place at the site of the public work.

****Penalty - Subject to Section 10-1001 of the State Government Article, the Commissioner may impose on a person that violates this section a civil penalty of up to \$50.00 per violation.**

Under the Maryland Apprenticeship and Training Council requirements, consistent with proper supervision, training and continuity of employment and applicable provisions in collective bargaining agreements, a ratio of one journey person regularly employed to one apprentice shall be allowed. No deviation from this ratio shall be permitted without prior written approval from the Maryland Apprenticeship and Training Council.

Laborers may NOT assist mechanics in the performance of the mechanic's work, NOR USE TOOLS peculiar to established trades.

ALL contractors and subcontractors shall employ only competent workers and apprentices and may NOT employ any individual classified as a HELPER or TRAINEE on a prevailing wage project.

The State Apprenticeship and Training Fund (Fund) law provides that contractors and certain subcontractors performing work on certain public work contracts are required to make contributions toward apprenticeship. See §17-601 through 17-606, State Finance and Procurement, Annotated Code of Maryland. Contractors and subcontractors have three options where they can choose to make their contributions: (1) participate in a registered apprenticeship training program; (2) contribute to an organization that has a registered apprenticeship training program; or (3) contribute to the State Apprenticeship and Training Fund.

The Department of Labor, Licensing and Regulation (DLLR) is moving forward with final adoption of regulations. The regulations were published in the December 14, 2012 edition of the Maryland Register.

IMPORTANT: Please note that the obligations under this law will become effective on JULY 1, 2013. This law will require that contractors and certain subcontractors make contributions toward apprenticeship and report those contributions on their certified payroll records that they submit pursuant to the prevailing wage law.

The Department is offering outreach seminars to any interested parties including contractors, trade associations, and any other stakeholders. Please contact the Department at prevailingwage@dllr.state.md.us or (410) 767-2968 for seminar times and locations. In addition, information regarding this law will be provided at pre-construction meetings for projects covered by the Prevailing Wage law.

**For additional information, contact:
Division of Labor and Industry
Maryland Apprenticeship and Training
1100 North Eutaw Street, Room 606
Baltimore, Maryland 21201
(410) 767-2246
E-Mail Address: matp@dllr.state.md.us.**

STATE OF MARYLAND

DEPARTMENT OF LABOR, LICENSING AND REGULATION
DIVISION OF LABOR AND INDUSTRY
PREVAILING WAGE SECTION
1100 N. Eutaw Street, Room 607
Baltimore, MD 21201
(410) 767-2342

The wage rates to be paid laborers and mechanics for the locality described below is announced by order of Commissioner of Labor and Industry.

It is mandatory upon the successful bidder and any subcontractor under him, to pay not less than the specific rates to all workers employed by them in executing contracts in this locality. Reference: Annotated Code of Maryland State Finance and Procurement, Section 17-201 thru 17-226.

These wage rates were taken from the locality survey of 2015 for Baltimore County, issued pursuant to the Commissioner's authority under State Finance and Procurement Article Section 17-209, Annotated Code of Maryland or subsequent modification.

**Note: If additional Prevailing Wage Rates are needed for this project beyond those listed below, contact the Prevailing Wage Unit. Phone: (410) 767-2342, email: prevailingwage@dllr.state.md.us.

Name and Title of Requesting Officer: Anita Randall - Procurement Officer
Department, Agency or Bureau: BCPS
6901 Charles Street, Building E Towson, MD 21204

Project Number ARA-209-17

Location and Description of work:

Baltimore County: Construction of Replacement School at Victory Villa Elementary School

Determination Number 30477

Date of Issue: Aug 29, 2016

BUILDING CONSTRUCTION

CLASSIFICATION	MODIFICATION REASON	BASIC HOURLY RATE	BORROWED FROM	FRINGE BENEFIT PAYMENT
BALANCING TECHNICIAN	AD	\$22.75		\$5.22
BOILERMAKER	AD	\$17.16		\$5.88
BRICKLAYER	AD	\$28.17		\$9.32
BRICKLAYER/SAWMAN	AD	\$30.00		\$9.32
CARPENTER	AD	\$26.21		\$12.95
CARPENTER - SHORING SCAFFOLD BUILDER	AD	\$26.21		\$12.95
CARPET LAYER	AD	\$27.83		\$10.27
CEMENT MASON	AD	\$24.61		\$12.74
COMMUNICATION INSTALLER TECHNICIAN	AD	\$24.63	003	\$11.97
DRYWALL - SPACKLING, TAPING, & FINISHING	AD	\$26.21		\$12.95
ELECTRICIAN	AD	\$35.60		\$16.56

ELEVATOR MECHANIC	AD	\$47.57		\$33.86
FIREPROOFER - BY HAND	AD	\$35.60	003	\$16.92
FIREPROOFER - SPRAYER	AD	\$23.40	003	\$2.29
FIRESTOPPER	AD	\$26.06		\$5.85
GLAZIER	AD	\$29.07		\$10.45
INSULATION WORKER	AD	\$33.13		\$14.04
IRONWORKER - FENCE ERECTOR	AD	\$26.88	003	\$17.24
IRONWORKER - ORNAMENTAL	AD	\$27.98	510	\$18.89
IRONWORKER - REINFORCING	AD	\$27.23		\$18.39
IRONWORKER - STRUCTURAL	AD	\$26.16		\$18.17
MILLWRIGHT	AD	\$29.46		\$13.20
PAINTER	AD	\$24.89		\$9.15
PILEDRIIVER	AD	\$26.21		\$12.95
PLASTERER	AD	\$28.33	510	\$5.95
PLASTERER - MIXER	AD	\$23.50	003	\$0.00
PLUMBER	AD	\$36.87		\$18.48
POWER EQUIPMENT OPERATOR - ASPHALT DISTRIBUTOR	AD	\$24.80	013	\$11.34
POWER EQUIPMENT OPERATOR - BACKHOE	AD	\$31.28	510	\$4.26
POWER EQUIPMENT OPERATOR - BOOM TRUCK	AD	\$35.26		\$10.36
POWER EQUIPMENT OPERATOR - BROOM / SWEEPER	AD	\$36.88	003	\$16.15
POWER EQUIPMENT OPERATOR - BULLDOZER	AD	\$27.88		\$12.97 a
POWER EQUIPMENT OPERATOR - CONCRETE PUMP	AD	\$27.50		\$17.80
POWER EQUIPMENT OPERATOR - CRANE	AD	\$31.00		\$15.35 a
POWER EQUIPMENT OPERATOR - CRANE - TOWER	AD	\$31.00	003	\$15.35 a
POWER EQUIPMENT OPERATOR - DRILL - RIG	AD	\$35.94		\$9.66 a
POWER EQUIPMENT OPERATOR - EXCAVATOR	AD	\$27.88		\$12.97 a
POWER EQUIPMENT OPERATOR - FORKLIFT	AD	\$27.88		\$12.97 a
POWER EQUIPMENT OPERATOR - GRADALL	AD	\$27.95	510	\$11.65
POWER EQUIPMENT OPERATOR - GRADER	AD	\$27.08		\$12.62 a
POWER EQUIPMENT OPERATOR - GUARD RAIL POST DRIVER	AD	\$26.60	510	\$11.21
POWER EQUIPMENT OPERATOR - HOIST	AD	\$34.09		\$4.73
POWER EQUIPMENT OPERATOR - LOADER	AD	\$27.88		\$12.97 a
POWER EQUIPMENT OPERATOR - MECHANIC	AD	\$27.88		\$12.97
POWER EQUIPMENT OPERATOR - OILER	AD	\$32.40	510	\$8.55
POWER EQUIPMENT OPERATOR - PAVER	AD	\$25.55		\$12.15
POWER EQUIPMENT OPERATOR - ROLLER - ASPHALT	AD	\$39.82	510	\$0.00 a + b
POWER EQUIPMENT OPERATOR - ROLLER - EARTH	AD	\$24.00	027	\$4.17 a
POWER EQUIPMENT OPERATOR - SCREED	AD	\$30.00	003	\$11.80
POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)	AD	\$24.05		\$11.55
POWER EQUIPMENT OPERATOR - TRENCHER	AD	\$25.75	003	\$11.80
POWER EQUIPMENT OPERATOR-VACCUM TRUCK	AD	\$26.00	013	\$0.00
RESILIENT FLOOR	AD	\$27.83		\$10.27
ROOFER/WATERPROOFER	AD	\$28.50		\$9.54
SHEETMETAL WORKER	AD	\$39.79		\$16.91
SPRINKLERFITTER	AD	\$34.51		\$18.37
STEAMFITTER/PIPEFITTER	AD	\$36.87		\$18.48

STONE MASON	AD	\$35.19	510	\$16.31
TILE & TERRAZZO FINISHER	AD	\$21.96		\$9.61
TILE & TERRAZZO MECHANIC	AD	\$26.75		\$10.78
TRUCK DRIVER - CONCRETE PUMP	AD	\$21.59		\$0.64
TRUCK DRIVER - DUMP	AD	\$17.64	027	\$1.82
TRUCK DRIVER - DUMP - ARTICULATING	AD	\$27.97	003	\$0.79
TRUCK DRIVER - FLATBED	AD	\$24.00		\$0.74
TRUCK DRIVER - LOWBOY	AD	\$22.00	003	\$5.57 a + b
TRUCK DRIVER - TACK/TAR TRUCK	AD	\$23.24	510	\$8.16
TRUCK DRIVER - TANDEM	AD	\$22.00	003	\$5.57

LABORER GROUP II

LABORER - ASPHALT RAKER	AD	\$18.99		\$2.78
LABORER - COMMON	AD	\$18.99		\$2.78
LABORER - CONCRETE PUDDLER	AD	\$18.99		\$2.78
LABORER - CONCRETE TENDER	AD	\$18.99		\$2.78
LABORER - CONCRETE VIBRATOR	AD	\$18.99		\$2.78
LABORER - DENSITY GAUGE	AD	\$18.99		\$2.78
LABORER - FIREPROOFER - MIXER	AD	\$18.99		\$2.78
LABORER - FLAGGER	AD	\$18.99		\$2.78
LABORER - GRADE CHECKER	AD	\$18.99		\$2.78
LABORER - HAND ROLLER	AD	\$18.99		\$2.78
LABORER - JACKHAMMER	AD	\$18.99		\$2.78
LABORER - LANDSCAPING	AD	\$18.99		\$2.78
LABORER - LAYOUT	AD	\$18.99		\$2.78
LABORER - LUTEMAN	AD	\$18.99		\$2.78
LABORER - MORTAR MIXER	AD	\$18.99		\$2.78
LABORER - PLASTERER - HANDLER	AD	\$18.99		\$2.78
LABORER - TAMPER	AD	\$18.99		\$2.78

LABORERS GROUP I

LABORER - AIR TOOL OPERATOR	AD	\$19.08		\$1.75
LABORER - ASPHALT PAVER	AD	\$19.08		\$1.75
LABORER - BLASTER - DYNAMITE	AD	\$19.08		\$1.75
LABORER - BURNER	AD	\$19.08		\$1.75
LABORER - CONCRETE SURFACER	AD	\$19.08		\$1.75
LABORER - HAZARDOUS MATERIAL HANDLER	AD	\$19.08		\$1.75
LABORER - MASON TENDER	AD	\$19.08		\$1.75
LABORER - PIPELAYER	AD	\$19.08		\$1.75
LABORER - SCAFFOLD BUILDER	AD	\$19.08		\$1.75

FRINGE REFERENCES AS NOTED:

a. PAID HOLIDAYS: New Year Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

b. PAID VACATIONS: Employees with 1 year service - 1 week paid vacation;
2 years service - 2 weeks paid vacation;
10 years service - 3 weeks paid vacation.

Incidental Craft Data: Caulker, Man Lift Operator, Rigger, Scaffold Builder, and Welder receive the wage and fringe rates prescribed for the craft performing the operation to which welding, scaffold building, rigging, operating a Man Lift, or caulking is incidental.

These **Informational Prevailing Wage Rates** may not be substituted for the requirements of pre-advertisement or onsite job posting for a public work contract that exceeds \$500,000 in value and either of the following criteria are met: (1) the contracting body is a unit of State government or an instrumentality of the State and there is any State funding for the project; or (2) the contracting body is a political subdivision, agency, person or entity (such as a county) and the State funds 50% or more of the project.

Modification Codes:

- (AD) 17-209 Annual Determination from Survey Wage Data Received
- (CH) 17-211 Commissioners' Hearing
- (CR) 17-208 Commissioners' Review
- (SR) 17-208 Survey Review by Staff

Each "Borrowed From" county is identified with the FIPS 3-digit county code unique for the specific jurisdiction in Maryland.

For additional information on the FIPS (Federal Information Processing Standard) code, see <http://www.census.gov/datamap/fipslist/AllSt.txt>

The Prevailing Wage rates appearing on this form were originally derived from Maryland's annual Wage Survey. The Commissioner of Labor & Industry encourages all contractors and interested groups to participate in the voluntary Wage Survey, detailing wage rates paid to workers on various types of construction throughout Maryland.

A mail list of both street and email addresses is maintained by the Prevailing Wage Unit to enable up-to-date prevailing wage information, including Wage Survey notices to be sent to contractors and other interested parties. If you would like to be included in the mailing list, please forward (1) your Name, (2) the name of your company (if applicable), (3) your complete postal mailing address, (4) your email address and (5) your telephone number to PWMAILINGLIST@dllr.state.md.us. Requests for inclusion can also be mailed to: Prevailing Wage, 1100 N. Eutaw Street - Room 607, Baltimore MD 21201-2201.

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Footings.
 - 2. Foundation walls.
 - 3. Slabs-on-grade.
 - 4. Concrete toppings.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Architect.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, testing agency.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Fiber reinforcement.
 - 6. Waterstops.
 - 7. Curing compounds.
 - 8. Floor and slab treatments.
 - 9. Bonding agents.
 - 10. Adhesives.
 - 11. Vapor retarders.
 - 12. Semirigid joint filler.
 - 13. Joint-filler strips.
 - 14. Repair materials.
- D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
 - 1. Aggregates
- E. Floor slabs shall be finished to a minimum flatness F-number Ff=30 and a minimum levelness F-number Fl=25 in any direction (U.N.O.).
 - 1. Exterior concrete stairs shall have the treads and landings sloped approximately 1/8" per 12" to assure that no water rests on a riser or the landing.
- F. Field quality-control reports.
- G. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specifications for Structural Concrete,"
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, **3/4 by 3/4 inch**, minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- I. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
1. Furnish units that will leave no corrodible metal closer than **1 inch** to the plane of exposed concrete surface.
 2. Furnish ties that, when removed, will leave holes no larger than **1 inch** in diameter in concrete surface.
 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.
- 2.2 STEEL REINFORCEMENT
- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Reinforcing Bars: ASTM A 615/A 615M, **Grade 60**, deformed.

- C. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from galvanized-steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, **Grade 60**, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, **Grade 60**, plain-steel bars, ASTM A 775/A 775M epoxy coated.
- C. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.
- D. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I/II
 - a. Fly Ash: ASTM C 618, Class F or C.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, Class 3M or Class 1N coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 - 1. Maximum Coarse-Aggregate Size: **3/4 inch** nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Lightweight Aggregate: ASTM C 330, **3/4-inch** nominal maximum aggregate size.
- D. Water: ASTM C 94/C 94 and potable.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 VAPOR RETARDERS

- A. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils thick.
- B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

2.7 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 1. Products: Subject to compliance with requirements, provide one of the following
 - a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
 - b. BASF Construction Chemicals - Building Systems; Confilm.
 - c. ChemMasters; SprayFilm.
 - d. Conspec by Dayton Superior; Aquafilm.
 - e. Dayton Superior Corporation; Sure Film (J-74).
 - f. Edoco by Dayton Superior; BurkeFilm.
 - g. Euclid Chemical Company (The), an RPM company; Eucobar.
 - h. Kaufman Products, Inc.; Vapor-Aid.
 - i. Lambert Corporation; LAMBCO Skin.
 - j. L&M Construction Chemicals, Inc.; E-CON.
 - k. Meadows, W. R., Inc.; EVAPRE.
 - l. Metalcrete Industries; Waterhold.
 - m. Nox-Crete Products Group; MONOFILM.
 - n. Sika Corporation; SikaFilm.
 - o. SpecChem, LLC; Spec Film.
 - p. Symons by Dayton Superior; Finishing Aid.
 - q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
 - r. Unitex; PRO-FILM.
 - s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. **Products:** Subject to compliance with requirements, provide one of the following
 - a. [Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.](#)
 - b. [BASF Construction Chemicals - Building Systems; Kure 200.](#)
 - c. [ChemMasters; Safe-Cure Clear.](#)
 - d. [Conspec by Dayton Superior; W.B. Resin Cure.](#)
 - e. [Dayton Superior Corporation; Day-Chem Rez Cure \(J-11-W\).](#)
 - f. [Edoco by Dayton Superior; Res X Cure WB.](#)
 - g. [Euclid Chemical Company \(The\), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.](#)
 - h. [Kaufman Products, Inc.; Thinfilm 420.](#)
 - i. [Lambert Corporation; AQUA KURE - CLEAR.](#)
 - j. [L&M Construction Chemicals, Inc.; L&M Cure R.](#)
 - k. [Meadows, W. R., Inc.; 1100-CLEAR.](#)
 - l. [Nox-Crete Products Group; Resin Cure E.](#)
 - m. [Right Pointe; Clear Water Resin.](#)
 - n. [SpecChem, LLC; Spec Rez Clear.](#)
 - o. [Symons by Dayton Superior; Resi-Chem Clear.](#)
 - p. [TK Products, Division of Sierra Corporation; TK-2519 DC WB.](#)
 - q. [Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.](#)
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating
1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [Anti-Hydro International, Inc.; AH Clear Cure WB.](#)
 - b. [BASF Construction Chemicals - Building Systems; Kure-N-Seal WB.](#)
 - c. [ChemMasters; Safe-Cure & Seal 20.](#)
 - d. [Conspec by Dayton Superior; Cure and Seal WB.](#)
 - e. [Cresset Chemical Company; Crete-Trete 309-VOC Cure & Seal.](#)
 - f. [Dayton Superior Corporation; Safe Cure and Seal \(J-18\).](#)
 - g. [Edoco by Dayton Superior; Spartan Cote WB II.](#)
 - h. [Euclid Chemical Company \(The\), an RPM company; Aqua Cure VOX; Clearseal WB 150.](#)
 - i. [Kaufman Products, Inc.; Cure & Seal 309 Emulsion.](#)
 - j. [Lambert Corporation; Glazecote Sealer-20.](#)
 - k. [L&M Construction Chemicals, Inc.; Dress & Seal WB.](#)
 - l. [Meadows, W. R., Inc.; Vocomp-20.](#)
 - m. [Metalcrete Industries; Metcure.](#)
 - n. [Nox-Crete Products Group; Cure & Seal 150E.](#)
 - o. [Symons by Dayton Superior; Cure & Seal 18 Percent E.](#)
 - p. [TK Products, Division of Sierra Corporation; TK-2519 WB.](#)
 - q. [Vexcon Chemicals, Inc.; Starseal 309.](#)

- G. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating.
1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [BASF Construction Chemicals - Building Systems; Kure-N-Seal W.](#)
 - b. [ChemMasters; Safe-Cure Clear.](#)
 - c. [Conspec by Dayton Superior; High Seal.](#)
 - d. [Dayton Superior Corporation; Safe Cure and Seal \(J-19\).](#)
 - e. [Edoco by Dayton Superior; Spartan Cote WB II 20 Percent.](#)
 - f. [Euclid Chemical Company \(The\), an RPM company; Diamond Clear VOX; Clearseal WB STD.](#)
 - g. [Kaufman Products, Inc.; SureCure Emulsion.](#)
 - h. [Lambert Corporation; Glazecote Sealer-20.](#)
 - i. [L&M Construction Chemicals, Inc.; Dress & Seal WB.](#)
 - j. [Meadows, W. R., Inc.; Vocomp-20.](#)
 - k. [Metalcrete Industries; Metcure 0800.](#)
 - l. [Nox-Crete Products Group; Cure & Seal 200E.](#)
 - m. [Symons by Dayton Superior; Cure & Seal 18 Percent E.](#)
 - n. [Vexcon Chemicals, Inc.; Starseal 0800.](#)
- H. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [BASF Construction Chemicals - Building Systems; Kure-N-Seal 25 LV.](#)
 - b. [ChemMasters; Spray-Cure & Seal Plus.](#)
 - c. [Conspec by Dayton Superior; Sealcure 1315.](#)
 - d. [Dayton Superior Corporation; Day-Chem Cure and Seal \(J-22UV\).](#)
 - e. [Edoco by Dayton Superior; Cureseal 1315.](#)
 - f. [Euclid Chemical Company \(The\), an RPM company; Super Diamond Clear; LusterSeal 300.](#)
 - g. [Kaufman Products, Inc.; Sure Cure 25.](#)
 - h. [Lambert Corporation; UV Super Seal.](#)
 - i. [L&M Construction Chemicals, Inc.; Lumiseal Plus.](#)
 - j. [Meadows, W. R., Inc.; CS-309/30.](#)
 - k. [Metalcrete Industries; Seal N Kure 30.](#)
 - l. [Right Pointe; Right Sheen 30.](#)
 - m. [Vexcon Chemicals, Inc.; Certi-Vex AC 1315.](#)
 2. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- I. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. [BASF Construction Chemicals - Building Systems; Kure 1315.](#)
 - b. [ChemMasters; Polyseal WB.](#)

- c. [Conspec by Dayton Superior; Sealcure 1315 WB.](#)
- d. [Edoco by Dayton Superior; Cureseal 1315 WB.](#)
- e. [Euclid Chemical Company \(The\), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.](#)
- f. [Kaufman Products, Inc.; Sure Cure 25 Emulsion.](#)
- g. [Lambert Corporation; UV Safe Seal.](#)
- h. [L&M Construction Chemicals, Inc.; Lumiseal WB Plus.](#)
- i. [Meadows, W. R., Inc.; Vocomp-30.](#)
- j. [Metalcrete Industries; Metcure 30.](#)
- k. [Right Pointe; Right Sheen WB30.](#)
- l. [Symons by Dayton Superior; Cure & Seal 31 Percent E.](#)
- m. [Vexcon Chemicals, Inc.; Vexcon Starseal 1315.](#)

- 2. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types I and II, non-load bearing or Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than **0.022-inch** thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than **0.034 inch** thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.9 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from **1/8 inch** and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Slabs-on-Grade, Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3000 psi at 28 days.
2. Minimum Cementitious Materials Content: 517 lb/cu. yd.
3. Maximum Water-Cementitious Materials Ratio: 0.50 maximum.
4. Slump Limit: 4 inches plus or minus 1 inch.
5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

B. Slabs on Deck and Topping Slabs: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Minimum Cementitious Materials Content: 517 lb/cu. yd.
3. Maximum Water-Cementitious Materials Ratio: 0.45 maximum.
4. Slump Limit: 3 inches plus or minus 1 inch.
5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

C. Exterior Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 3500 psi at 28 days.
2. Minimum Cementitious Materials Content: 517 lb/cu. yd.
3. Maximum Water-Cementitious Materials Ratio: 0.45 maximum.
4. Slump Limit: 4 inches plus or minus 1 inch.
5. Air Content: Used in concrete exposed to weather. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 5.0 to 7.0 percent, unless otherwise indicated.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class C, 1/2 inch.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 1. Lap joints **6 inches** and seal with manufacturer's recommended tape.
- B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.
- C. Granular Course: Cover vapor retarder with **[granular fill] [fine-graded granular material]**, moisten, and compact with mechanical equipment to elevation tolerances of plus **0 inch** or minus **3/4 inch**.
 1. Place and compact a **1/2-inch-** thick layer of fine-graded granular material over granular fill.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least **1-1/2 inches** into concrete.
 - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut **1/8-inch-** wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than **1/2 inch** or more than **1 inch** below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least **6 inches** into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below **40 deg F (4.4 deg C)** for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below **90 deg F (32 deg C)** at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.7 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view.
- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
 - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 - 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
 - 3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of **1/4 inch (6 mm)** in one direction.
 - 1. Apply scratch finish to surfaces indicated
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots.

Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated

2. Finish surfaces to the following tolerances, according to [ASTM E 1155](#), for a randomly trafficked floor surface:

a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching [0.2 lb/sq. ft. x h](#) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with **12-inch** lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least **12 inches**, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least six month(s). Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

- C. Install semirigid joint filler full depth in saw-cut joints and at least **2 inches** deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a **No. 16** sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than **1/2 inch** in any dimension to solid concrete. Limit cut depth to **3/4 inch**. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of **0.01 inch** wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.
 - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 - 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 - 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of **1/4 inch** to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - 6. Repair defective areas, except random cracks and single holes **1 inch** or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean,

square cuts and expose steel reinforcement with at least a **3/4-inch** clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes **1 inch** or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.13 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.
 4. Verification of use of required design mixture.
 5. Concrete placement, including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.
 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding **5 cu. yd.**, but less than **25 cu. yd.**, plus one set for each additional **50 cu. yd.** or fraction thereof.
 2. Testing Frequency: Obtain at least one composite sample for each **100 cu. yd.** or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 7. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 10. Strength of each concrete mixture 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.
 11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

END OF SECTION 033000

SECTION 04 20 00
UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Concrete unit masonry.
 - 2. Polished Ground Face CMU.
 - 3. Insulation in masonry walls.
 - 4. Through wall flashings.
 - 5. Mortar and grout.
 - 6. Masonry reinforcement and anchors.
 - 7. Masonry accessories.
- B. Work installed but furnished under other sections:
 - 1. Section 04 21 00 Brick Masonry.
 - 2. Section 07 27 20 Fluid Applied Air Barriers.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 7 Section "Sheet Metal Flashing" for exposed sheet-metal flashing installed in masonry.
- D. Products installed but not furnished under this Section include the following:
 - 1. Steel lintels for unit masonry specified in Division 5 Section "Metal Fabrications."
 - 2. Wood nailers and blocking built into unit masonry specified in Division 6 Section "Rough Carpentry."
 - 3. Manufactured reglets in masonry joints for metal flashing specified in Division 7 Section "Sheet Metal Flashing."
 - 4. Hollow metal frames in unit masonry openings specified in Division 8 Section "Steel Doors and Frames."

1.3 DEFINITIONS

- A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. LEED Submittals:
 - 1. Product Certificates for Credit MR 5.1 and Credit MR 5.2: For products and materials required to comply with requirements for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or

recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.

- C. Shop Drawings: For the following:
 - 1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
- D. Product data for each different masonry unit, accessory, and other manufactured product specified.
- E. Samples for selection of the following:
 - 1. Unit masonry samples in small-scale form showing the full range of colors and textures available for each different exposed masonry unit required.
- F. Samples for verification of the following:
 - 1. Full-size units for each different exposed masonry unit required showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
- G. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to specifically identify exact materials used. Include mix proportions for mortar and grout and source of aggregates.
 - 1. Submittal is for information only. Neither receipt of list nor acceptance of mockup constitutes approval of deviations from Contract Documents unless such deviations are specifically brought to the attention of the Architect and approved in writing.
- H. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Cementitious materials. Include brand, type, and name of manufacturer.
 - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 4. Grout mixes. Include description of type and proportions of ingredients.
 - 5. Reinforcing bars.
 - 6. Joint reinforcement.
 - 7. Anchors, ties, and metal accessories.
- I. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.
- J. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry.

1.5 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire resistance ratings determined per ASTM E 119 by

equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

- C. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
 - D. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
 - E. Mockup: Prior to installing unit masonry, construct sample wall panels to verify selections made under sample submittals and to demonstrate aesthetic effects as well as other qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
 - 1. Locate mockups on site in the locations indicated or, if not indicated, as directed by Architect.
 - 2. Build mockups for the following types of masonry in sizes approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness, including face and back-up wythes as well as accessories. Include a sealant-filled joint at least 16 inches (400 mm) long in each mockup.
 - a. Typical exterior ground-face concrete masonry wall with through-wall flashing installed for a 24-inch (600-mm) length in corner of mockup approximately 16 inches (400 mm) down from top of mockup with a 12-inch (300-mm) length of flashing left exposed to view (omit masonry above half of flashing).
 - 3. Clean exposed faces of mockups with masonry cleaner indicated.
 - 4. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.
 - 5. Notify Architect one week in advance of the dates and times when mockups will be constructed.
 - 6. Protect accepted mockups from the elements with weather-resistant membrane.
 - 7. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - a. Acceptance of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
 - b. Acceptance of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
 - c. When directed, demolish and remove mockups from Project site.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.
 - B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
 - C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.
 - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:
 - 1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
 - a. 40 to 32 deg F (4 to 0 deg C): Heat mixing water or sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C).
 - b. 32 to 25 deg F (0 to -4 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry.
 - c. 25 to 20 deg F (-4 to -7 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C) . Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F (4 deg C) if grouting. Use heat on both sides of walls under construction.
 - d. 20 deg F (-7 deg C) and Below: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49

deg C) . Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F (4 deg C) . Provide enclosures and use heat on both sides of walls under construction to maintain temperatures above 32 deg F (0 deg C) within the enclosures.

2. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:
 - a. 40 to 25 deg F (4 to -4 deg C): Cover masonry with a weather-resistant membrane for 48 hours after construction.
 - b. 25 to 20 deg F (-4 to -7 deg C) : Cover masonry with insulating blankets or provide enclosure and heat for 48 hours after construction to .-prevent freezing. Install wind breaks when wind velocity exceeds 15 mi./h (25 km/h),
 - c. 20 deg F (-7 deg C) and Below: Provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 48 hours after construction.
 3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.
- E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Concrete Masonry Units:
 - a. Expanded Slag aggregate CMU by Maier Masonry Products.
 - b. Limestone or Solite aggregate CMU by Supreme.
 - c. Lightweight aggregate CMU by United Concrete Products.
 2. Portland Cement, Mortar Cement, Masonry Cement, and Lime:
 - a. Glen-Gery Corporation.
 - b. Lafarge Corporation.
 - c. Lehigh Portland Cement Co.
 - d. Riverton Corporation (The).
 3. Joint Reinforcement, Ties, and Anchors:
 - a. Dur-O-Wall, Inc.
 - b. Heckman Building Products, Inc.
 - c. Hohmann & Barnard, Inc.

2.2 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows for each form of concrete masonry unit required.
 1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 2. Provide bullnose units for outside corners, unless otherwise indicated.

- B. Concrete Masonry Units: ASTM C 90 and as follows:
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength indicated below:
 - a. 1900 psi (13.1 MPa).
 - b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.
 2. Weight Classification: Normalweight.
 3. Aggregates: ASTM C331; Do not use aggregates made from pumice, scoria, or tuff. Cinder aggregates are not acceptable.
 4. Provide Type I, moisture-controlled units, high- or low-pressure steam cured.
 5. Size: Manufactured to the actual dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings:
 - a. 8 inch (200 mm) nominal: 7-5/8 inch (194 mm) actual
 6. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
 7. Exposed Corners: Rounded.

2.3 POLISHED GROUND FACE UNIT MASONRY – ASTM C90

1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:

a. Ground Face CMU: Representative Product: "Trendstone Plus" filled and polished masonry units as manufactured by Odcastle Architectural/Echelon/Tenwyth.

Local manufacturer: Anchor Concrete Products (800) 233-1924. Church Road • Emigsville, PA 17318

b. Equal manufacturers: Nitterhouse Masonry Products, 859 Cleveland Ave, Chambersburg, PA Polished Ground Face CMU. Tel: (717) 267-4500.

2. Size: 7 5/8" x 15 5/8" x 3 5/8" typical.

3. Aggregates: Conform to ASTM C33. All sampling and testing shall be according to ASTM C140.

4. All load-bearing CMU comply with ASTM C90.

5. Pattern and Texture: Standard ground-face finish.

6. Exposed Corners: Rounded.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.

- B. Masonry Cement: ASTM C 91.
 - 1. For pigmented mortars, use premixed, colored masonry cements of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 5 percent of masonry cement by weight for mineral oxides nor 1 percent for carbon black.
 - 2. For colored-aggregate mortars, use masonry cement of natural color or white as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm), use aggregate graded with 100 percent passing the No. 16 (1.18 mm) sieve.
- E. Aggregate for Grout: ASTM C 404.
- F. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this Article; combined with set controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.
- G. Water: Potable
- H. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Colored Masonry Cement
 - a. Lehigh Custom Color Masonry Cement; Lehigh Portland Cement Co.
 - b. Flamingo Color Masonry Cement; Riverton Corporation (The).
 - 1) Color: Mix to match color of Riverton C-320.

2.5 REINFORCING STEEL

- A. Steel Reinforcing Bars: Material and grade as follows:
 - 1. Billet Steel complying with ASTM A 615 (ASTM A 615M), Grade 60.
- B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet (3 m), with prefabricated corner and tee units, and complying with requirements indicated below:
 - 1. Wire Diameter for Side Rods: 0.1875 inch (4.8 mm).
 - 2. Wire Diameter for Cross Rods: 0.1875 inch (4.8 mm).
- C. For single-wythe masonry, provide type as follows with single pair of side rods:
 - 1. Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.
- D. For multiwythe masonry, provide type as follows:
 - 1. Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.
 - a. Number of Side Rods for Multiwythe Concrete Masonry: One side rod for each face shell of hollow masonry units more than 4 inches (100 mm) in width, plus 1 side rod for each wythe of masonry 4 inches (100 mm) or less in width.
 - b. Provide integral drips on cross rods at cavity walls.
 - 2. Adjustable (2-piece) tab design with single pair of side rods and rectangular box-type cross ties spaced not more than 16 inches (407 mm) o.c., with side rods spaced for embedment within each face shell of back-up wythe and with separate adjustable ties engaging the cross ties and extended to engage the outer wythe by at least 1-1/2 inches (38 mm) and spaced not more than 16 inches (407 mm) o.c.
 - a. Use where horizontal joints of facing wythe do not align with those of back-up and where indicated.

2.6 TIES AND ANCHORS, GENERAL

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.
- B. Wire: As follows:
 - 1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
 - 2. Wire Diameter: 0.1875 inch (4.8 mm).
- C. Steel Sheet: As follows:
 - 1. Galvanized Steel Sheet: ASTM A 526, G 60 (ASTM A 526M, Z 180) (commercial quality), steel sheet zinc coated by hot-dip process on continuous lines prior to fabrication, for sheet-metal ties and anchors in interior walls and in exterior walls when completely embedded in mortar.
- D. Thickness of Steel Sheet Galvanized After Fabrication: Uncoated thickness of steel sheet for hot-dip galvanizing after fabrication:
 - 1. 0.0598 inch (1.5 mm).

2.7 BENT WIRE TIES

- A. Individual units prefabricated from bent wire to comply with requirements indicated below:
 - 1. Tie Shape for Solid Masonry Unit Construction and for Hollow Masonry Units with Cells Horizontal: Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches (50 mm) long.
 - 2. Type for Masonry Where Coursing Between Wythes Does Not Align: Adjustable ties composed of 2 parts; one with pintles, the other with eyes; maximum misalignment of 1 1/4 inches (32 mm).

2.8 MASONRY VENEER ANCHORS

- A. Masonry-Veneer Anchors: Units consisting of a metal anchor section and a connector section designed to engage a continuous wire embedded in the veneer mortar joint.
 - 1. Anchor Section: Gasketed sheet metal plate, 1-1/4 inches (32 mm) wide by 6 inches (150 mm) long, with screw holes top and bottom; top and bottom ends bent to form pronged legs to bridge insulation or sheathing and contact studs; and raised rib-stiffened strap, 5/8 inch (16 mm) wide by 6 inches (150 mm) long, stamped into center to provide a slot between strap and plate for inserting wire tie. Provide anchor manufacturer's standard, self-adhering, modified bituminous gaskets manufactured to fit behind anchor plate and extend beyond pronged legs.
 - 2. Connector Section: Triangular wire tie and rigid PVC extrusion with snap-in grooves for inserting continuous wire. Size wire tie to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face.
 - 3. Fabricate sheet metal anchor sections and other sheet metal parts from 0.097--inch- (2. 5-rm-) thick, steel sheet, galvanized after fabrication.
 - 4. Fabricate wire connector sections from 0.25-inch (6. 4-mm-) diameter, hot-dip galvanized, carbon steel wire.
 - 5. Products; Hohmann & Barnard Inc., 30 Rasons Court | Hauppauge, NY 11788. T: 800.645.0616. website: www.h-b.com
 - a. Anchor for connection to steel stud backup:
 - 1) Thermal 2-Seal™ Wing Nut Anchor: A single screw veneer tie for metal stud construction with a dual-diameter barrel with projecting Thermal wings made from plastic to create a thermal break. Screw (Carbon Steel): ASTM A510 (Carbon Steel); ASTM C954 (1000-hour polymer coating); Wire (Stainless

Steel): ASTM A580/A580M - AISI Type 304. Tensile Strength - 80,000 p.s.i. | Yield Point - 70,000 p.s.i. minimum.

b. Anchor for connection to CMU and concrete backup:

- 1) Thermal Concrete 2-Seal™ Wing Nut Anchor: A single screw veneer tie for concrete and CMU construction with a dual-diameter barrel with projecting Thermal wings made from plastic to create a thermal break. Screw (Carbon Steel): ASTM A510 (Carbon Steel); ASTM C954 (1000-hour polymer coating); Wire (Stainless Steel): ASTM A580/A580M - AISI Type 304. Tensile Strength - 80,000 p.s.i. | Yield Point - 70,000 p.s.i. minimum.

c. Polymer-Coated, Steel Drill Screws for Steel Studs:

- 1) ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 (4.8-mm) diameter by length required to penetrate steel stud flange with not less than 3 exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.

d. Anchors for battered Brick and CMU cavity Walls:

- 1) Adjustable anchors for connecting masonry to CMU framework: combination CMU reinforcing and brick veneer anchor system: Multi-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.
- 2) For anchorage to CMU, provide manufacturer's standard 3/16" diameter shaped wire tie section sized to extend within 1 inch of masonry face and as follows: Hohmann & Barnard #180 S.I.S. Double Loop-Lok Truss System with Loop-Lok washer and Tru-Joint System to hold insulation in place.

2.9 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
 1. Nonheaded bolts, bent in manner indicated.
- B. Postinstalled Anchors: Anchors as indicated, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 1. Type: Expansion anchors as indicated.
 2. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).

2.11 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated; formulated from the following material:

1. Neoprene.

B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

C. Weep Holes: Provide the following:

1. Wicking Material: Material as indicated below, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity between wythes:

a. Cotton sash cord, 3/8" diameter.

D. Cavity Wall Weep Vents: Use the following unless otherwise indicated:

1. Mesh Weep/Vent: Free draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe; in color selected from manufacturer's standard.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) "QV Quadro-Vent" Weep Vents by Hohman & Barnard.

2) Mortar Maze weep vent system by Advanced Building Products, Inc. Springvale, Maine 04083. Toll-free: (800) 252-2306. E-mail: info@advancedflashing.com

3) Weep tube/wicks for within 4" of grade:

a. Acceptable product: AA Wire Products Co., #AA223KW.

b. Characteristics: 3/8" o.d. by 33/4" long plastic tube, with copper screen insert at exposed end and with rope wick inserted full length of tube, extending 6" beyond cavity end.

E. Cavity Drainage Material: 1-inch- (25-mm-) thick, reticulated, nonabsorbent mesh, made from polyethylene strands and shaped to maintain drainage at weep holes without being clogged by mortar droppings.

1. Product: Subject to compliance with requirements, provide "Mortar Net" by Mortar Net USA, Ltd.

Equal Products: Cav-clear, Mor-Control, Dur-o-wal, For use in all cavity drainage trays. Use 2 layers staggered.

2.12 EMBEDDED FLASHING MATERIALS

A. EPDM Membrane Thru-Wall Flashing System: Manufacturer's flashing installed in accordance with the manufacturer's recommendations. Type as indicated below:

1. Carlisle EPDM Membrane: 40 mil thick CCW-705-TWF Self Adhering Membrane composite consisting of 32 mil self adhering rubberized asphalt membrane laminated to an 8 mil high density polyethylene film.
2. Membrane Flashing System: including but not limited to the following systems: internal and external corners, level changes and stop ends of all standard types/varieties to provide a complete installation. Flashing at all window sills to be formed up as shown on the drawings.
3. Application: Use where flashing is fully concealed in masonry.
4. Color: Black.
5. Accessories and Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated including the following:
 - a. Carlisle CCW-Primers.
 - b. Carlisle CCW-704 Mastic.
 - c. Carlisle Secur Tape
6. Products: Subject to compliance with requirements, provide one of the following:
 - a. Carlisle Flashing Thru-Wall System: Carlisle Coatings and Waterproofing Inc. Sapulpa, OK (phone: 800-338-8071)
 - b. Monsey Bakor Flashing Thru-Wall System: "Blueskin TWF" by Monsey Bakor.

2.13 WINDOW FLASHING MATERIALS

A. Elasticized polyethylene laminate Flashing Tape. Manufacturer's flashing installed in accordance with the manufacturer's recommendations. Type as indicated below:

1. Henry "Blueskin SA": by Henry Company/Bakor.
2. Description: Self Adhering composite membrane consisting of an SBS rubberized asphalt compound which is integrally laminated to a blue, high density, cross-laminated polyethylene film. A transition membrane to span gap between wall and window frame around entire window perimeter.
3. Installation: Continuous around all widow jambs and heads. Flashing at all window jambs shall overlap the membrane Sill Flashing System at the window sills.

2.14 SHELF ANGLE FLASHING ACCESSORIES

A. Drip Plate flashing system for steel angle lintels with lip brick flashing details installed in accordance with the manufacturer's recommendations. Type as indicated below:

1. Hohman & Barnard "Drip Plates and Accessories": Hohman & Barnard Inc, 30 Ransons Court, Hauppauge, New York 11788. Tel: 800-645-0616.
2. Description: Flashing system for steel angle lintels BOTH "with" and "without" lip brick flashing details.

3. Drip Plate: FTSA-LB Drip Plate Type 304 (dull stainless steel) with factory formed hemmed drip edge. The through wall flashing shall terminate on to this drip plate.
4. Foam Seal: FTS (Foam Tite Seal).
5. Neoprene Sponge: Install under bottom of steel lintel and brick below.

B. Shelf Angle Wall Flashing:

1. Perm-A-Barrier Wall Flashing. Perm-A-Barrier Wall Flashing shall be used at all locations where flashings run horizontally under brick masonry or precast concrete. Perm-A-Barrier Perm-A-Barrier® Wall Flashing is a 40-mil, self-adhesive flashing for cavity wall applications. Consisting of 32 mil of rubberized asphalt integrally bonded to an 8 mil, high-density, cross laminated polyethylene film, Perm-A-Barrier® Wall Flashing is designed to be strong and thick enough to resist punctures and tears. The unique self-sealing and self-adhesive characteristics of the rubberized asphalt allow it to resist leaks from minor cuts while providing a flashing solution that self-adheres to concrete, masonry, steel, gypsum and wood substrates. Flashing shall be compatible with Self Adhering EPDM Membrane Thru-wall Flashing. Grace Construction Products, 62 Whittemore Avenue, Cambridge, MA 02140. Tel: (866) 333-3726. (617) 876-1400. Website: www.graceconstruction.com.

A. Self Adhering Flexible Air Barrier Transition Medium: For transitions between fluid applied air and vapor barrier and window flashings and or other air and vapor barriers.

1. Install on all surfaces of all concrete masonry units and all concrete structure at all locations where material transitions occur. Install around all windows. Install at transitions across joints where CMU abuts concrete and all other material transitions.
2. Minimum width of Transition: 18" wide.
3. Product to be "Blueskin SA" All products by Monsey Bakor Kimberton, Pa. (phone: 610-933-8888). Product to be Self-Adhering Prefabricated Modified Bitumen Sheets.

2.16 INSULATION

A. Extruded Polystyrene Board Insulation: Rigid, cellular, polystyrene thermal insulation with closed cells and integral high-density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; in manufacturer's standard lengths and widths; and in thicknesses indicated.

1. Representative Product: STYROFOAM™ Brand CAVITYMATE™ SC Insulation
 - a. 2.0" Thick; R 10 (aged R Value); 4 x 8 Sheet; Shiplap Edges; 16 psi compressive strength.
 - b. Controls condensation, corrects steel stud thermal shorts and improves performance of cavity insulation in commercial and residential high-rise buildings.

B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.13 MASONRY CLEANERS

- A. Available Cleaning Products: Subject to compliance with requirements, and masonry manufacturers express product approval, a product that may be used to clean unit masonry surfaces includes, but is not limited to, the following:
1. "Sure Klean No. 600 Detergent," ProSoCo, Inc.
 2. "Sure Klean No. 101 Lime Solvent," ProSoCo., Inc.
 3. "Sure Klean Vana Trol," ProSoCo, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of thickness indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections of the Specifications.
- C. Leave openings for equipment to be installed before completion of masonry. After installing equipment, complete masonry to match construction immediately adjacent to the opening.
- D. Cut masonry units with motor-driven saws to provide clean, sharp, un-chipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.

3.3 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls, and arrises, do not

exceed 1/4 inch in 10 feet (6 mm in 3 m), nor 3/8 inch in 20 feet (10 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For vertical alignment of head joints, do not exceed plus or minus 1/4 inch in 10 feet (6 mm in 3 m) , nor 1/2 inch (12 mm) maximum.

- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For top surface of bearing walls, do not exceed 1/8 inch (3 mm) in 10 feet (3 m), nor 1/16 inch (1.5 mm) within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 1/2 inch in 20 feet (12 mm in 6 m), nor 3/4 inch in 40 feet (19 mm in 12 m) or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch (6 mm) nor plus 1/2 inch (12 mm) .
- E. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm) . Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8 inch (3 mm). Do not vary from head-joint thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary head-joint thickness from adjacent headjoint thickness by more than 1/8 inch (3 mm). Do not vary from collar-joint thickness indicated by more than minus 1/4 inch (6 mm) or plus 3/8 inch (10 mm).

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- F. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar prior to laying fresh masonry.

- G. Built-in Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- H. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
 - 1. At exterior frames, insert extruded polystyrene board insulation around perimeter of frame in thickness indicated, but not less than 3/4 inch (19 mm) to act as a thermal break between frame and masonry.
- I. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- J. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- K. Build non-load bearing interior partitions full height of story to underside of solid floor or roof structure above and as follows:
 - I. Install compressible filler in joint between top of partition and underside of structure above.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
 - 4. Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 3/8-inch (10-mm) joints.
- B. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not furrow bed joints or slush head joints.
 - 1. At cavity walls, slope beds toward cavity to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against cavity face of brick.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

3.6 STRUCTURAL BONDING OF MULTI-WYTHE MASONRY

A. Use continuous horizontal-joint reinforcement installed in horizontal mortar joints for bond tie between wythes.

B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

1. Provide continuity with horizontal-joint reinforcement at corners by using prefabricated "L" units in addition to masonry bonding.

C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:

1. Provide continuity with horizontal-joint reinforcement by using prefabricated "T" units.

3.7 CAVITIES

A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

B. Tie exterior wythe to back-up with continuous horizontal-joint reinforcing.

3.8 CAVITY-WALL AND MASONRY-CELL INSULATION

A. On units of plastic board insulation, place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c., both ways on inside face or attach to inside face with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.9 HORIZONTAL-JOINT REINFORCEMENT

A. General: Provide continuous horizontal-joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcing a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.

2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.

3. Provide reinforcement in mortar joint 1 block course above and below wall openings and extending 12 inches (305 mm) beyond opening.

a. Reinforcement above is in addition to continuous reinforcement.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.10 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch (25 mm) in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.11 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry veneer anchors to comply with the following requirements:

1. Fasten screw-attached anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed connector sections and continuous wire in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 8 inches (203 mm), around perimeter.

3.11 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry. Build-in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Fit bond-breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.

- C. Form expansion joints in brick made from clay or shale as follows:
 - 1. Form open joint of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants." Maintain joint free and clear of mortar.
- D. Build-in horizontal pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 7 Section "Joint Sealants."
 - 1. Locate horizontal pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.12 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where steel lintels are not indicated and where openings of more than 12 inches (305 mm) for brick size units and 24 inches (610 mm) for block size units are shown without structural steel or other supporting lintels.
 - 1. Provide precast lintels made from concrete matching concrete masonry units in texture, and compressive strength and with reinforcement bars indicated or required to support loads indicated. Cure precast lintels by same method as CMU.
- C. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

3.13 FLASHING, WEEP HOLES, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.
- B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer before covering with mortar.
- C. Install flashing as follows:
 - 1. At composite masonry walls, including cavity walls, extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches (100 mm), and through the inner wythe to within 1/2 inch (13 mm) of the interior face of the wall in exposed masonry. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2 inches (50 mm), unless otherwise indicated.
 - 2. At lintels and shelf angles, extend flashing a minimum of 4 inches (100 mm) into masonry at each end. At heads and sills, extend flashing 4 inches (100 mm) at ends and turn up not less than 2 inches (50 mm) to form a pan.
 - 3. Cut off flashing flush with face of wall after masonry wall construction is completed.
- D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

1. Form weep holes with product specified in Part 2 of this Section. 2. Space weep holes 16 inches (400 mm) o.c.
3. Place cavity drainage material immediately above flashing in cavities.

E. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

F. Install reglets and nailers for flashing and other related construction where shown to be built into masonry.

3.14 REINFORCED UNIT MASONRY INSTALLATION

A. Placing Reinforcement: Comply with requirements in [ACI 530.1/ASCE 6/TMS 602] [Section 2104.5 in the Uniform Building Code].

B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6 /TMS 602 for clean-outs and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches (1520 mm).

3.15 FIELD QUALITY CONTROL

A. Testing Agency: BCPS will engage and pay for a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports:

1. Place grout only verified compliance grades, sizes, reinforcement. after inspectors have of grout spaces and and locations of

B. Clay Masonry Unit Test: provided, per ASTM C 67. For each type of unit

C. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.

D. Prism Test: For each type of construction provided, per ASTM C 1314.

3.16 PARGING

A. Parge pre-dampened masonry walls, where indicated, with Type S or Type N mortar applied in 2 uniform coats to a total thickness of 3/4 inch (19 mm).

Scarify first parging coat to ensure full bond to subsequent coat.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot (3 mm per 300 mm). Form a wash at top of parging and a cove at bottom.

C. Damp cure parging for at least 24 hours and protect until cured.

3.17 REPAIRING, POINTING, AND CLEANING

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

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and

completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.

- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 5. Clean brick by bucket and brush hand-cleaning method described in BIA Technical Note No. 20 Revised, using the following masonry cleaner:
 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain present on exposed surfaces.
 7. Apply acrylic coating to exterior ground-face concrete masonry in strict accordance with manufacturer's recommendations.
- E. Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04 20 00

SECTION 04 21 13 - BRICK MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Face brick.
 - 2. Mortar and grout.
 - 3. Ties and anchors.
 - 4. Embedded flashing.
 - 5. Miscellaneous masonry accessories.
- B. Related Sections:
 - 1. Division 05 Section "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
 - 2. Division 05 Section "Cold Formed Metal Framing" for installing steel steel steel studs (cold formed metal framing) (cold formed metal framing) at exterior brick/steel stud cavity walls.
 - 3. Division 05 Section "Metal Fabrications" for furnishing steel lintels and shelf angles for brick masonry.
 - 4. Division 07 Section "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.
- C. Product Data: For each type of product indicated.
- D. LEED Submittals:
 - 1. Product Certificates for Credit MR 5.1 **and** Credit MR 5.2: For products and materials required to comply with requirements for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
- E. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
 - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- F. Samples for Initial Selection:
 - 1. Concrete facing brick, in the form of small-scale units.
 - 2. Face brick, in the form of straps of five or more bricks.

3. Stone trim.
4. Colored mortar.
5. Weep holes/vents.

G. Samples for Verification: For each type and color of the following:

1. Face brick, in the form of straps of five or more bricks.
2. Special brick shapes.
3. Stone trim.
4. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.
5. Weep holes[and vents].
6. Accessories embedded in masonry.

H. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

I. Material Certificates: For each type and size of the following:

1. Masonry units.
 - a. Include test results for efflorescence according to ASTM C 67 confirming that the actual bricks being used on this project are efflorescence free.
 - b. Include material test reports substantiating compliance with requirements.
 - c. For exposed brick,
2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
4. Grout mixes. Include description of type and proportions of ingredients.
5. Anchors, ties, and metal accessories.

J. Cold-Weather **and** Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.3 QUALITY ASSURANCE

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

- D. Sample Panels: Build sample panels to verify selections made under sample submittals and to demonstrate aesthetic effects. Comply with requirements in Division 01 Section "Quality Requirements" for mockups.
1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 48 inches long by 48 inches high by full thickness.
 2. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.
 3. Clean one-half of exposed faces of panels with masonry cleaner indicated.
 4. Protect approved sample panels from the elements with weather-resistant membrane.
 5. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
 - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by Architect in writing.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup of typical wall area as shown on Drawings.
 2. Build mockups for each type of exposed unit masonry construction in sizes approximately 60 inches 48 inches high by full thickness, including accessories.
 - a. Include a sealant-filled joint at least 16 inches long in each mockup.
 - b. Include lower corner of framed window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches wide by 16 inches high.
 - c. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
 - d. Include steel studs (cold formed metal framing), sheathing, air/vapor barrier sheathing joint-and-penetration treatment], veneer anchors, flashing, cavity drainage material], and weep holes in mockup.
 3. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
 4. Clean one-half of exposed faces of mock-ups with masonry cleaner as indicated.
 5. Protect accepted mockups from the elements with weather-resistant membrane.
 6. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
 7. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.5 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
 - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 BRICK

- A. Regional Materials: Provide brick that has been manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units.
1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- C. Face Brick: Facing brick complying with ASTM C 216 .
1. Products: Subject to compliance with requirements, provide one of the following:
 2. Cushwa Brick (A Redland Brick):
 - a. Brick Color 1: Glen Gery "52DD" Modular. Mid-Atlantic Plant. Mortar to match brick color.
 - b. Brick Color 2: Watsonstown Brick Co. Manhattan Series; M2 Houston (KT); Type 8; Modular. Mortar to match brick color.
 3. Grade: SW.
 4. Type: FBS.
 5. Texture: Molded.

6. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67.
7. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
8. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet .
9. Size: Actual Dimensions 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.

2.3 MORTAR MATERIALS

- A. Regional Materials: Provide aggregate for mortar, cement, and lime that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- E. Masonry Cement: ASTM C 91.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Capital Materials Corporation; Flamingo Color Masonry Cement.
 - b. Cemex S.A.B. de C.V.; Brikset Type N.
 - c. Essroc, Italcementi Group; Brixment
 - d. Holcim (US) Inc.; Rainbow Mortamix Custom Buff Masonry Cement.
 - e. Lafarge North America Inc.; Magnolia Masonry Cement or Lafarge Masonry Cement.
 - f. Lehigh Cement Company; Lehigh Masonry Cement.
 - g. National Cement Company, Inc.; Coosa Masonry Cement.
- F. Mortar Cement: ASTM C 1329.
 1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. Lafarge North America Inc.; Lafarge Mortar Cement or Magnolia Superbond Mortar Cement.
- G. Mortar Color for Brick Veneer Masonry:
 1. Match brick color.
- H. Aggregate for Mortar: ASTM C 144.
 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.

2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- I. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Euclid Chemical Company (The); Accelguard 80.
 - b. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
 - c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.

2.4 REINFORCEMENT

- A. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
- B. Masonry Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.187-inch- (4.76-mm-) diameter, hot-dip galvanized, carbon or stainless-steel continuous wire.

2.4 REINFORCING STEEL

- A. Steel Reinforcing Bars: Material and grade as follows:
 1. Billet Steel complying with ASTM A 615 (ASTM A 615M), Grade 60.
- B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet (3 m), with prefabricated corner and tee units, and complying with requirements indicated below:
 1. Wire Diameter for Side Rods: 0.1875 inch (4.8 mm).
 2. Wire Diameter for Cross Rods: 0.1875 inch (4.8 mm).
- C. For single-wythe masonry, provide type as follows with single pair of side rods:
 1. Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.
- D. For multiwythe masonry, provide type as follows:
 1. Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.
 - a. Number of Side Rods for Multiwythe Concrete Masonry: One side rod for each face shell of hollow masonry units more than 4 inches (100 mm) in width, plus 1 side rod for each wythe of masonry 4 inches (100 mm) or less in width.
 - b. Provide integral drips on cross rods at cavity walls.
 2. Adjustable (2-piece) tab design with single pair of side rods and rectangular box-type cross ties spaced not more than 16 inches (407 mm) o.c., with side rods spaced for embedment within each face shell of back-up wythe and with separate adjustable ties engaging the cross ties and extended to engage the outer wythe by

at least 1-1/2 inches (38 mm) and spaced not more than 16 inches (407 mm) o.c.

- a. Use where horizontal joints of facing wythe do not align with those of back-up and where indicated.

2.6 TIES AND ANCHORS, GENERAL

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.
- B. Wire: As follows:
 1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
 2. Wire Diameter: 0.1875 inch (4.8 mm).
- C. Steel Sheet: As follows:
 1. Galvanized Steel Sheet: ASTM A 526, G 60 (ASTM A 526M, Z 180) (commercial quality), steel sheet zinc coated by hot-dip process on continuous lines prior to fabrication, for sheet-metal ties and anchors in interior walls and in exterior walls when completely embedded in mortar.
- D. Thickness of Steel Sheet Galvanized After Fabrication: Uncoated thickness of steel sheet for hot-dip galvanizing after fabrication:
 1. 0.0598 inch (1.5 mm).

2.7 BENT WIRE TIES

- A. Individual units prefabricated from bent wire to comply with requirements indicated below:
 1. Tie Shape for Solid Masonry Unit Construction and for Hollow Masonry Units with Cells Horizontal: Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches (50 mm) long.
 2. Type for Masonry Where Coursing Between Wythes Does Not Align: Adjustable ties composed of 2 parts; one with pintles, the other with eyes; maximum misalignment of 1 1/4 inches (32 mm).

2.8 MASONRY VENEER ANCHORS

- A. Masonry-Veneer Anchors: Units consisting of a metal anchor section and a connector section designed to engage a continuous wire embedded in the veneer mortar joint.
 1. Anchor Section: Gasketed sheet metal plate, 1-1/4 inches (32 mm) wide by 6 inches (150 mm) long, with screw holes top and bottom; top and bottom ends bent to form pronged legs to bridge insulation or sheathing and contact studs; and raised rib-stiffened strap, 5/8 inch (16 mm) wide by 6 inches (150 mm) long, stamped into center to provide a slot between strap and plate for inserting wire tie. Provide anchor manufacturer's standard, self-adhering, modified bituminous gaskets manufactured to fit behind anchor plate and extend beyond pronged legs.
 2. Connector Section: Triangular wire tie and rigid PVC extrusion with snap-in grooves for inserting continuous wire. Size wire tie to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face.
 3. Fabricate sheet metal anchor sections and other sheet metal parts from 0.097--inch- (2. 5-rm-) thick, steel sheet, galvanized after fabrication.
 4. Fabricate wire connector sections from 0.25-inch (6. 4-mm-) diameter, hot-dip galvanized, carbon steel wire.
 5. Products; Hohmann & Barnard Inc., 30 Rasons Court | Hauppauge, NY 11788. T: 800.645.0616. website: www.h-b.com

- a. Anchor for connection to steel stud backup:
 - 1) Thermal 2-Seal™ Wing Nut Anchor: A single screw veneer tie for metal stud construction with a dual-diameter barrel with projecting Thermal wings made from plastic to create a thermal break. Screw (Carbon Steel): ASTM A510 (Carbon Steel); ASTM C954 (1000-hour polymer coating); Wire (Stainless Steel): ASTM A580/A580M - AISI Type 304. Tensile Strength - 80,000 p.s.i. | Yield Point - 70,000 p.s.i. minimum. Accepts a 2X-HOOK™ and spin to easily orient pintles/hooks parallel to masonry joints.

- b. Anchor for connection to CMU and concrete backup:
 - 1) Thermal Concrete 2-Seal™ Wing Nut Anchor: A single screw veneer tie for concrete and CMU construction with a dual-diameter barrel with projecting Thermal wings made from plastic to create a thermal break. Screw (Carbon Steel): ASTM A510 (Carbon Steel); ASTM C954 (1000-hour polymer coating); Wire (Stainless Steel): ASTM A580/A580M - AISI Type 304. Tensile Strength - 80,000 p.s.i. | Yield Point - 70,000 p.s.i. minimum. Accepts a 2X-HOOK™ and spin to easily orient pintles/hooks parallel to masonry joints

- c. Polymer-Coated, Steel Drill Screws for Steel Studs:
 - 1) ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 (4.8-mm) diameter by length required to penetrate steel stud flange with not less than 3 exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.

- d. Anchors for battered Brick and CMU cavity Walls:
 - 1) Adjustable anchors for connecting masonry to CMU framework: combination CMU reinforcing and brick veneer anchor system: Multi-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.

 - 2) For anchorage to CMU, provide manufacturer's standard 3/16" diameter shaped wire tie section sized to extend within 1 inch of masonry face and as follows: Hohmann & Barnard #180 S.I.S. Double Loop-Lok Truss System with Loop-Lok washer and Tru-Joint System to hold insulation in place.

2.9 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
 - 1. Nonheaded bolts, bent in manner indicated.

- B. Postinstalled Anchors: Anchors as indicated, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
1. Type: Expansion anchors as indicated.
 2. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).

2.11 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated; formulated from the following material:

1. Neoprene.

- B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

- C. Weep Holes: Provide the following:

1. Wicking Material: Material as indicated below, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity between wythes:

- a. Cotton sash cord, 3/8" diameter.

- D. Cavity Wall Weep Vents: Use the following unless otherwise indicated:

1. Mesh Weep/Vent: Free draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe; in color selected from manufacturer's standard.

- a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- 1) "QV Quadro-Vent" Weep Vents by Hohman & Barnard.

- 2) Mortar Maze weep vent system by Advanced Building Products, Inc. Springvale, Maine 04083. Toll-free: (800) 252-2306. E-mail: info@advancedflashing.com

- 3) Weep tube/wicks for within 4" of grade:

- a. Acceptable product: AA Wire Products Co., #AA223KW.

- b. Characteristics: 3/8" o.d. by 33/4" long plastic tube, with copper screen insert at exposed end and with rope wick inserted full length of tube, extending 6" beyond cavity end.

- E. Cavity Drainage Material: 1-inch- (25-mm-) thick, reticulated, nonabsorbent mesh, made from polyethylene strands and shaped to maintain drainage at weep holes without being clogged by mortar droppings.

1. Product: Subject to compliance with requirements, provide "Mortar Net" by Mortar Net USA, Ltd.

Equal Products: Cav-clear, Mor-Control, Dur-o-wal, For use in all cavity drainage trays.
Use 2 layers staggered.

2.12 EMBEDDED SELF ADHERING FLASHING MATERIALS

- A. EPDM Membrane Thru-Wall Flashing System: Manufacturer's flashing installed in accordance with the manufacturer's recommendations. Type as indicated below:

1. Carlisle EPDM Membrane: 40 mil thick CCW-705-TWF Self Adhering Membrane composite consisting of 32 mil self adhering rubberized asphalt membrane laminated to an 8 mil high density polyethylene film.
2. Membrane Flashing System: including but not limited to the following systems: internal and external corners, level changes and stop ends of all standard types/varieties to provide a complete installation. Flashing at all window sills to be formed up as shown on the drawings.
3. Application: Use where flashing is fully concealed in masonry.
4. Color: Black.
5. Accessories and Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated including the following:
 - a. Carlisle CCW-Primers.
 - b. Carlisle CCW-704 Mastic.
 - c. Carlisle Secur Tape
6. Products: Subject to compliance with requirements, provide one of the following:
 - a. Carlisle Flashing Thru-Wall System: Carlisle Coatings and Waterproofing Inc. Sapulpa, OK (phone: 800-338-8071)
 - b. Monsey Bakor Flashing Thru-Wall System: "Blueskin TWF" by Monsey Bakor.

2.13 WINDOW FLASHING MATERIALS

- A. Elasticized polyethylene laminate Flashing Tape. Manufacturer's flashing installed in accordance with the manufacturer's recommendations. Type as indicated below:

1. Henry "Blueskin SA": by Henry Company/Bakor.
2. Description: Self Adhering composite membrane consisting of an SBS rubberized asphalt compound which is integrally laminated to a blue, high density, cross-laminated polyethylene film. A transition membrane to span gap between wall and window frame around entire window perimeter.
3. Installation: Continuous around all widow jambs and heads. Flashing at all window jambs shall overlap the membrane Sill Flashing System at the window sills.

2.14 SHELF ANGLE FLASHING ACCESSORIES

- A. Drip Plate flashing system for steel angle lintels with lip brick flashing details installed in accordance with the manufacturer's recommendations. Type as indicated below:
1. Hohman & Barnard "Drip Plates and Accessories": Hohman & Barnard Inc, 30 Ransons Court, Hauppauge, New York 11788. Tel: 800-645-0616.
 2. Description: Flashing system for steel angle lintels BOTH "with" and "without" lip brick flashing details.
 3. Drip Plate: FTSA-LB Drip Plate Type 304 (dull stainless steel) with factory formed hemmed drip edge. The through wall flashing shall terminate on to this drip plate.
 4. Foam Seal: FTS (Foam Tite Seal).
 5. Neoprene Sponge: Install under bottom of steel lintel and brick below.

B. Shelf Angle Wall Flashing:

1. Perm-A-Barrier Wall Flashing. Perm-A-Barrier Wall Flashing shall be used at all locations where flashings run horizontally under brick masonry or precast concrete. Perm-A-Barrier Perm-A-Barrier® Wall Flashing is a 40-mil, self-adhesive flashing for cavity wall applications. Consisting of 32 mil of rubberized asphalt integrally bonded to an 8 mil, high-density, cross laminated polyethylene film, Perm-A-Barrier® Wall Flashing is designed to be strong and thick enough to resist punctures and tears. The unique self-sealing and self-adhesive characteristics of the rubberized asphalt allow it to resist leaks from minor cuts while providing a flashing solution that self-adheres to concrete, masonry, steel, gypsum and wood substrates. Flashing shall be compatible with Self Adhering EPDM Membrane Thru-wall Flashing. Grace Construction Products, 62 Whittemore Avenue, Cambridge, MA 02140. Tel: (866) 333-3726. (617) 876-1400. Website: www.graceconstruction.com.

A. Self Adhering Flexible Air Barrier Transition Medium: For transitions between fluid applied air and vapor barrier and window flashings and or other air and vapor barriers.

1. Install on all surfaces of all concrete masonry units and all concrete structure at all locations where material transitions occur. Install around all windows. Install at transitions across joints where CMU abuts concrete and all other material transitions.
2. Minimum width of Transition: 18" wide.
3. Product to be "Blueskin SA" All products by Monsey Bakor Kimberton, Pa. (phone: 610-933-8888). Product to be Self-Adhering Prefabricated Modified Bitumen Sheets.

2.16 INSULATION

- A. Extruded Polystyrene Board Insulation: Rigid, cellular, polystyrene thermal insulation with closed cells and integral high-density skin, formed by the expansion of polystyrene base

resin in an extrusion process to comply with ASTM C 578, Type IV; in manufacturer's standard lengths and widths; and in thicknesses indicated.

1. Representative Product: STYROFOAM™ Brand CAVITYMATE™ SC Insulation
 - a. 2.5" Thick; R 12.5 (aged R Value); 4 x 8 Sheet; Shiplap Edges; 16 psi compressive strength.
 - b. Controls condensation, corrects steel stud thermal shorts and improves performance of cavity insulation in commercial and residential high-rise buildings.
- B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.13 MASONRY CLEANERS

- A. Available Cleaning Products: Subject to compliance with requirements, and masonry manufacturers express product approval, a product that may be used to clean unit masonry surfaces includes, but is not limited to, the following:
 1. "Sure Klean No. 600 Detergent," ProSoCo, Inc.
 2. "Sure Klean No. 101 Lime Solvent," ProSoCo., Inc.
 3. "Sure Klean Vana Trol," ProSoCo, Inc.
 4. EaCo Chem, Inc.NMD 80

2.5 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 1. Do not use calcium chloride in mortar.
 2. Use portland cement-lime mortar unless otherwise indicated.
 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide Type N unless another type is indicated.
- D. Pigmented Mortar: Use colored cement product **or** select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
 1. Pigments shall not exceed 10 percent of portland cement by weight.
 2. Mix to match Architect's sample.
 3. Application: Use pigmented mortar for exposed mortar joints with the following units:
 - a. Concrete facing brick.
 - b. Face brick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine 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.

3.2 INSTALLATION, GENERAL

- A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
 - 1. Mix units from several pallets or cubes as they are placed.
- D. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- E. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 - 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 - 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
 - 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
 - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
 - 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.

4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm); do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm)
3. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond. English bond around original cornerstone. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow brick as follows:
 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 2. With entire units, including areas under cells, fully bedded in mortar at starting course on footings.

- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Set **[stone]** **[cast-stone]** trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
 - 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
 - 2. Allow cleaned surfaces to dry before setting.
 - 3. Wet joint surfaces thoroughly before applying mortar.
- D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:
 - 1. Provide an open space not less than **1 inch (25 mm)** wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.7 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to wall framing and concrete masonry unit backup with seismic masonry-veneer anchors to comply with the following requirements:
 - 1. Fasten screw-attached and seismic anchors through sheathing to wall framing and to concrete masonry unit backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
 - 2. Insert slip-in anchors in metal steel studs (cold formed metal framing) as sheathing is installed. Provide one anchor at each stud in each horizontal joint between sheathing boards.
 - 3. Embed tie sections or connector sections and continuous wire in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
 - 4. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 5. Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 8 inches (203 mm), around perimeter.
 - 6. Space anchors as indicated, but not more than 16 inches (406 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally with not less than 1 anchor for each 3.5 sq. ft. (0.33 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 36 inches (914 mm), around perimeter.

3.8 EXPANSION JOINTS

- A. General: Install expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form expansion joints in brick as follows:
 - 1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches (100 mm) in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
 - 2. Build flanges of factory-fabricated, expansion-joint units into masonry.
 - 3. Build in compressible joint fillers where indicated.
 - 4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 07 Section "Joint Sealants."
- C. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 07 Section "Joint Sealants," but not less than 3/8 inch (10 mm).
 - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.9 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

3.10 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 - 2. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches (200 mm); with upper edge tucked under building paper or building wrap, lapping at least 4 inches (100 mm).
 - 3. At lintels and shelf angles, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
 - 4. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing manufacturer, and seal lap with

elastomeric sealant complying with requirements in Division 07 Section "Joint Sealants" for application indicated.

5. Install metal drip edges and sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Division 07 Section "Joint Sealants" for application indicated.
 6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal drip edge.
 7. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal flashing termination.
 8. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
1. Use specified weep/vent products to form weep holes.
 2. Use wicking material to form weep holes above flashing under brick sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
 3. Space weep holes 24 inches (600 mm) o.c. unless otherwise indicated.
 4. Space weep holes formed from extruded plastic 16 inches (400 mm) o.c.
 5. Trim wicking material flush with outside face of wall after mortar has set.
- E. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches (50 mm), to maintain drainage.
- F. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- G. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.
1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.11 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
- B. Inspections: Level 1 special inspections according to the "International Building Code."
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.

- C. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

3.12 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean brick by bucket-and-brush hand-cleaning method described in "BIA Technical Notes 20."
 - 6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
 - 7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.
 - 8. Clean stone trim to comply with stone supplier's written instructions.
 - 9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.13 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Division 31 Section "Earth Moving."

3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 21 13

SECTION 04 72 00 - CAST STONE MASONRY - WET CAST

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast stone copings.
2. Cast stone trim.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include dimensions and finishes.
- B. Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.
- C. Samples:
1. For each color and texture of cast stone required.
 2. For colored mortar.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364, including test for resistance to freezing and thawing.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer of cast stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute and/or the Architectural Precast Association.

PART 2 - PRODUCTS

2.1 CAST STONE UNITS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Sun Precast Co., Inc. 4051 Ridge Road. Beaver Springs PA 17812. Tel: (570) 658-8000.

2. Cast Stone Designs, Inc. 8029-A Cessna Ave. Gaithersburg, MD 20879 Phone: 240.631.9325 Fax: 240.631.9327. mycaststone@gmail.com | www.caststonedesigns.com
3. Nelson Precast. 2501 West Lexington Street. Baltimore, MD 21223. Phone: (410) 522-7190. Fax: (410) 732-3408.

B. Provide cast stone units complying with ASTM C 1364 using the wet-cast method.

1. Provide units that are resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.
2. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
3. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
4. Provide drips on projecting elements unless otherwise indicated.

C. Cure units as follows:

1. Cure units in enclosed moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F (38 deg C) for 12 hours or 70 deg F (21 deg C) for 16 hours.
2. Keep units damp and continue curing to comply with one of the following:
 - a. No fewer than five days at mean daily temperature of 70 deg F (21 deg C) or above.
 - b. No fewer than six days at mean daily temperature of 60 deg F (16 deg C) or above.
 - c. No fewer than seven days at mean daily temperature of 50 deg F (10 deg C) or above.
 - d. No fewer than eight days at mean daily temperature of 45 deg F (7 deg C) or above.

D. Acid etch units after curing to remove cement film from surfaces to be exposed to view.

E. Colors and Textures: Color and texture shall match Oolitic Indiana Buff Limestone.

1. Representative sample (Sun Precast Company Inc. colors):
 - a. Color 302 Limestone Light Grey
 - b. Color 101 Light Buff
 - c. Color 312 Tan

2.2 ACCESSORIES

- A. Anchors: Type and size indicated, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.
- B. Dowels: 1/2-inch- (12-mm-) diameter, round bars, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.
- C. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner complying with requirements in Section 042000 "Unit Masonry," and expressly approved for intended use by cast stone manufacturer and cleaner manufacturer.

2.3 MORTAR

- A. Comply with requirements in Section 042000 "Unit Masonry" for mortar materials and mixes.
 - 1. For setting mortar, use Type S.
 - 2. For pointing mortar, use Type N.
 - 3. Pigmented Mortar: Use colored cement product.

2.4 SOURCE QUALITY CONTROL

- A. Engage a qualified independent testing agency to sample and test cast stone units according to ASTM C 1364.
 - 1. Include one test for resistance to freezing and thawing.

PART 3 - EXECUTION

3.1 SETTING CAST STONE IN MORTAR

- A. Set units in full bed of mortar with full head joints unless otherwise indicated.
 - 1. Fill dowel holes and anchor slots with mortar.
 - 2. Fill collar joints solid as units are set.
 - 3. Build concealed flashing into mortar joints as units are set.
 - 4. Keep head joints in coping and other units with exposed horizontal surfaces open to receive sealant.
 - 5. Keep joints at shelf angles open to receive sealant.
- B. Rake out joints for pointing with mortar to depths of not less than 3/4 inch (19 mm). Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.
- C. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch (10 mm). Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
- D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- E. Provide sealant joints at copings and other horizontal surfaces, at expansion, control, and pressure-relieving joints, and at locations indicated.
 - 1. Keep joints free of mortar and other rigid materials.
 - 2. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.2 SETTING ANCHORED CAST STONE WITH SEALANT-FILLED JOINTS

- A. Set units accurately in locations indicated with edges and faces aligned.

1. Install anchors, supports, fasteners, and other attachments to secure units in place.
 2. Shim and adjust anchors, supports, and accessories.
- B. Fill anchor holes with sealant.
1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.
- C. Set cast stone supported on clip or continuous angles on resilient setting shims. Hold shims back from face of cast stone a distance at least equal to width of joint.
- D. Keep joints free of mortar and other rigid materials. Remove temporary shims and spacers from joints after anchors and supports are secured in place and cast stone units are anchored.
- E. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- B. Variation from Level: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
- C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less.
- D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch (1.5 mm), except where variation is due to warpage of units within tolerances specified.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.
- B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean cast stone as work progresses.
 1. Remove mortar fins and smears before tooling joints.
 2. Remove excess sealant immediately, including spills, smears, and spatter.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone to comply with requirements in Section 042000 "Unit Masonry."

END OF SECTION 04 72 00

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural steel.
2. Field-installed shear connectors.
3. Grout.

B. Related Requirements:

1. Section 053100 "Steel Decking" for field installation of shear connectors through deck.
2. Section 055000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame, miscellaneous steel fabrications and other steel items not defined as structural steel.

1.3 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
- C. Heavy Sections: Rolled and built-up sections as follows:
 1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches.
 2. Welded built-up members with plates thicker than 2 inches.
 3. Column base plates thicker than 2 inches.

1.4 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment Drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:
 - 1. Power source (constant current or constant voltage).
 - 2. Electrode manufacturer and trade name, for demand critical welds.
- D. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural steel, including chemical and physical properties.
- E. Product Test Reports: For the following:
 - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 2. Direct-tension indicators.
 - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 - 4. Shear stud connectors.
 - 5. Shop primers.
 - 6. Nonshrink grout.
- F. Survey of existing conditions.

- G. Source quality-control reports.
- H. Field quality-control and special inspection reports.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector
- C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- E. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC 303.
 - 2. AISC 341 and AISC 341s1.
 - 3. AISC 360.
 - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.
1. Select and complete connections using schematic details indicated and AISC 360.
 2. Load data are given at service-load level.

2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992, Grade 50
- B. Channels, Angles, M, S-Shapes: ASTM A 36
- C. Plate and Bar: ASTM A 36/A
- D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
1. Weight Class: as indicated.
 2. Finish: Black except where indicated to be galvanized.
- F. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, ASTM A 563M, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
1. Direct-Tension Indicators: ASTM F 959, Type 325 compressible-washer type with plain finish.
- B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- C. Unheaded Anchor Rods: ASTM F 1554, Grade 36
1. Configuration: as indicated
 2. Nuts: ASTM A 563 hex carbon steel.
 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 4. Washers: ASTM F 436, Type 1, hardened carbon steel.
 5. Finish: Plain
- D. Headed Anchor Rods: grade as indicated.

1. Nuts: **ASTM A 563** heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: **ASTM F 436**, Type 1, hardened carbon steel.
4. Finish: Plain

E. Threaded Rods: **ASTM A 36**

1. Nuts: **ASTM A 563 (ASTM A 563M)** hex carbon steel.
2. Washers: **ASTM F 436**, Type 1, hardened
3. Finish: Plain

F. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

G. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

2.4 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.5 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning or SSPC-SP 3, "Power Tool Cleaning."
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened
- B. Weld Connections: Comply with AWS D1.1 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.8 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of **2 inches**.
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces.
 - 6. Surfaces enclosed in interior construction.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of **1.5 mils**. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
- D. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than **1.5 mils**.

2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 2. Galvanize lintels shelf angles and welded door frames attached to structural-steel frame and located in exterior walls.
 3. All structural steel, bolts, connectors and fasteners exposed to moisture shall be galvanized.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

- B. Baseplates, Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened
- B. Weld Connections: Comply with AWS D1.1 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 PREFABRICATED BUILDING COLUMNS

- A. Install prefabricated building columns to comply with AISC 360, manufacturer's written recommendations, and requirements of testing and inspecting agency that apply to the fire-resistance rating indicated.

3.6 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
 - 1. Verify structural-steel materials and inspect steel frame joint details.
 - 2. Verify weld materials and inspect welds.
 - 3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- E. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 - 2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

3.7 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

- C. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- D. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

END OF SECTION 051200

SECTION 05 12 10 - ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes architecturally exposed structural-steel framing for monumental stair.
 - 1. Requirements in Division 05 Section "Structural Steel Framing" also apply to AESS framing.

1.2 DEFINITIONS

- A. Architecturally Exposed Structural Steel: Structural steel designated as "architecturally exposed structural steel" or "AESS" in the Contract Documents.

1.3 SUBMITTALS

- A. Shop Drawings: Show fabrication of AESS components.
 - 1. Indicate welds by standard AWS symbols. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain. Indicate grinding, finish, and profile of welds.
 - 2. Indicate type, size, and length of bolts.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Laboratory Test Reports for Credit IEQ 4: For primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Samples: Submit samples of AESS to set quality standards for exposed welds.
 - 1. Two steel plates, 3/8 by 8 by 4 inches (9.5 by 200 by 100 mm), with long edges joined by a groove weld and with weld ground smooth.
 - 2. Steel plate, 3/8 by 8 by 8 inches (9.5 by 200 by 200 mm), with one end of a short length of rectangular steel tube, 4 by 6 by 3/8 inches (100 by 150 by 9.5 mm), welded to plate with a continuous fillet weld and with weld ground smooth and blended.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who has at least 5 years experience with 3 min successfully completed similar projects.

- B. Fabricator Qualifications: A qualified installer who has at least 5 years experience with 3 min successfully completed similar projects.
- C. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional structural engineer.
- D. Professional Engineer Qualifications: A professional structural engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for design and detailing for steel support framing and steel stairway framing that are similar to those indicated for this Project in material, design, and extent.
- E. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P2 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- F. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Use special care in handling to prevent twisting, warping, nicking, and other damage. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Where AESS is indicated to fit against other construction, verify actual dimensions by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 BOLTS, CONNECTORS, AND ANCHORS

- A. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, round-head assemblies.
 - 1. Finish: Plain.
- B. Corrosion-Resisting (Weathering Steel), Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 3, round-head assemblies.

2.2 PRIMER

- A. Primer: Comply with Division 09 painting Sections. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

- B. Galvanizing Repair Paint: SSPC-Paint 20.

2.3 FABRICATION

- A. In addition to special care used to handle and fabricate AESS, comply with the following:
 - 1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes.
 - 2. Grind sheared, punched, and flame-cut edges smooth.
 - 3. Fabricate with exposed surfaces free of mill marks.
 - 4. Fabricate with exposed surfaces free of seams to maximum extent possible.
 - 5. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.
 - 6. Fabricate with piece marks fully hidden in the completed structure or made with media that permits full removal after erection.
 - 7. Fabricate to the tolerances specified in AISC 303 for steel that is designated AESS.
 - 8. Seal-weld open ends of hollow structural sections with 3/8-inch (9.5-mm) closure plates.
- B. Curved Members: Fabricate indicated members to curved shape by rolling to final shape in fabrication shop.
 - 1. Distortion of webs, stems, outstanding flanges, and legs of angles shall not be visible from a distance of 20 feet (6 m) under any lighting conditions.
 - 2. Tolerances for walls of hollow steel sections after rolling shall be approximately 1/2 inch (13 mm).
- C. Coping, Blocking, and Joint Gaps: Maintain uniform gaps of 1/8 inch (3.2 mm) with a tolerance of 1/32 inch (0.8 mm).
- D. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- E. Cleaning Corrosion-Resisting Structural Steel: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.4 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work, and comply with the following:

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding specified tolerances.
2. Use weld sizes, fabrication sequence, and equipment that limit distortions to allowable tolerances.
3. Provide continuous, sealed welds at angle to gusset-plate connections and similar locations where AESS is exposed to weather.
4. Provide continuous welds of uniform size and profile where AESS is welded.
5. Grind butt and groove welds flush to adjacent surfaces within tolerance of plus 1/16 inch, minus 0 inch (plus 1.5 mm, minus 0 mm).
6. Make butt and groove welds flush to adjacent surfaces within tolerance of plus 1/16 inch, minus 0 inch (plus 1.5 mm, minus 0 mm). Do not grind unless required for clearances or for fitting other components, or unless directed to correct unacceptable work.
7. Remove backing bars or runoff tabs; back-gouge and grind steel smooth.
8. At locations where welding on the far side of an exposed connection of AESS occurs, grind distortions and marking of the steel to a smooth profile aligned with adjacent material.
9. Make fillet welds oversize and grind to uniform profile with smooth face and transition.
10. Make fillet welds of uniform size and profile with exposed face smooth and slightly concave. Do not grind unless directed to correct unacceptable work.

2.5 STEEL STAIRS

A. Description of AESS Steel Stairs:

1. Monumental Stair: Shop fabricated steel stairs with precast terrazzo treads mortared to steel pan treads. Final assembly and welding in field. See specification section 05 50 00 Metal Fabrications and Steel Stairs for railings and handrails.

B. Description of Steel Stair Framing:

1. Fabricate stringers of curved steel channels.
2. Construct platforms of steel channels with steel headers and miscellaneous framing members.
3. Steel Plate Stairs: Form risers, subtreads, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements

C. Structural Performance of Metal Stairs: Capable of withstanding the following structural loads without exceeding the allowable design working stress of the materials involved:

1. Treads and Platforms of Metal Stairs: Uniform load of 100 lbf/sq. ft. (4.79 kN/sq. m) or a concentrated load of 300 lbf (1.33 kN) on an area of 4 sq. in. (25.8 sq. cm), in addition to precast terrazzo treads, flooring and setting bed, whichever produces the greater stress.
2. Uniform and concentrated loads need not be assumed to act concurrently.
3. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
4. Deflection: Limit deflection of treads, platforms, and framing members to L/240 for Stairs 1 & 2 and L/360 for Stair 3.

2.6 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
 2. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
 3. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 2. Surfaces to be field welded.
 3. Surfaces to be high-strength bolted with slip-critical connections.
 4. Surfaces to receive sprayed fire-resistive materials.
 5. Galvanized surfaces.
- B. Surface Preparation for Nongalvanized Steel:
1. SSPC-SP 3, "Power Tool Cleaning."
 2. SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning."
 3. SSPC-SP 14/NACE No. 8, "Industrial Blast Cleaning."
 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
 5. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 6. SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning."
- C. Preparing Galvanized Steel for Shop Priming: After galvanizing, thoroughly clean steel of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.
- D. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep AESS secure, plumb, and in alignment.
 - 1. If possible, locate welded tabs for attaching temporary bracing and safety cabling where they will be concealed from view in the completed Work.
- B. Set AESS accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
 - 1. Erect AESS to the tolerances specified in AISC 303 for steel that [is] [is not] designated AESS.
- C. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

3.3 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened.
 - 2. Orient bolt heads in same direction for each connection and to maximum extent possible in same direction for similar connections.
- B. Weld Connections: Comply with requirements in "Weld Connections" Paragraph in "Shop Connections" Article.
 - 1. Remove backing bars or runoff tabs; back-gouge and grind steel smooth.
 - 2. Remove erection bolts, fill holes, and grind smooth.
 - 3. Fill weld access holes and grind smooth.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect AESS as specified in Division 05 Section "Structural Steel Framing." The testing agency will not be responsible for enforcing requirements relating to aesthetic effect.
- B. Architect will observe AESS in place to determine acceptability relating to aesthetic effect.

3.5 REPAIRS AND PROTECTION

- A. Remove welded tabs that were used for attaching temporary bracing and safety cabling and that are exposed to view in the completed Work. Grind steel smooth.

- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 051213

SECTION 052100 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. K-series steel joists.
2. KCS-type K-series steel joists.
3. K-series steel joist substitutes.
4. LH- and DLH-series long-span steel joists.
5. CJ-series composite steel joists.
6. Joist girders.
7. Joist accessories.

B. Related Requirements:

1. Section 042000 "Unit Masonry" for installing bearing plates in unit masonry.

C. This project is to be "LEED" certified and have the following requirements:

1. Structural Steel: Recycle content minimum 90 percent with at least 70% post-consumer.

1.3 DEFINITIONS

- A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

2. Laboratory Test Reports for Credit IEQ 4: For primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Drawings:

1. Include layout, designation, number, type, location, and spacing of joists.
2. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.
3. Indicate locations and details of bearing plates to be embedded in other construction.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer
- B. Welding certificates.
- C. Manufacturer certificates.
- D. Mill Certificates: For each type of bolt.
- E. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."
 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.8 SEQUENCING

- A. Deliver steel bearing plates to be built into masonry construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.
 - 1. Use ASD; data are given at service-load level
 - 2. Design special joists to withstand design loads with live-load deflections no greater than the following:
 - a. Roof Joists: Vertical deflection of 1/240 of the span.

2.2 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
 - 1. Joist Type: KCS-type K-series steel joists
- B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- C. Provide holes in chord members for connecting and securing other construction to joists.
- D. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."
- E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- F. Do not camber joists.
- G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds **1/4 inch per 12 inches (1:48)**.

2.3 PRIMERS

- A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.4 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Fabricate steel bearing plates from ASTM A 36/A 36M steel with integral anchorages of sizes and thicknesses indicated. Shop prime paint

- C. Steel bearing plates with integral anchorages are specified in Section 055000 "Metal Fabrications."
- D. Welding Electrodes: Comply with AWS standards.
- E. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.5 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.
 - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
- C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.
- B. Visually inspect field welds according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, test field welds according to AWS D1.1/D1.1M and the following procedures, as applicable:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709.
 - c. Ultrasonic Testing: ASTM E 164.
 - d. Radiographic Testing: ASTM E 94.
- C. Visually inspect bolted connections.
- D. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.
- E. Perform additional testing to determine compliance of corrected Work with specified requirements.

3.4 PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates, abutting structural steel, and accessories.
 - 1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2, or power-tool cleaning according to SSPC-SP 3.
 - 2. Apply a compatible primer of same type as primer used on adjacent surfaces.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 9
- D. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 052100

SECTION 053100 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Roof deck.
2. Non-composite form deck.
3. Acoustical Roof Deck

B. Related Requirements:

1. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.
2. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
3. Section 099113 "Exterior Painting" for repair painting of primed deck and finish painting of deck.
4. Section 099123 "Interior Painting" for repair painting of primed deck and finish painting of deck.

C. This project is to be "LEED" certified and have the following requirements:

1. Recycle content minimum 70 percent with at least 55% post-consumer.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
2. Laboratory Test Reports for Credit EQ 4: For primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Drawings:

1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 1. Power-actuated mechanical fasteners.
- D. Evaluation Reports: For steel deck.
- E. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- C. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

C. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2.2 ROOF DECK

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. [ASC Profiles, Inc.; a Blue Scope Steel company.](#)
2. [Canam United States; Canam Group Inc.](#)
3. [Consolidated Systems, Inc.; Metal Dek Group.](#)
4. [Cordeck.](#)
5. [DACS, Inc.](#)
6. [Marlyn Steel Decks, Inc.](#)
7. [New Millennium Building Systems, LLC.](#)
8. [Nucor Corp.; Vulcraft Group.](#)
9. [Roof Deck, Inc.](#)
10. [Valley Joist; Subsidiary of EBSCO Industries, Inc.](#)
11. [Verco Manufacturing Co.](#)

B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:

1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade **33**
 - a. Color: Gray
2. Deck Profile: As indicated
3. Profile Depth: As indicated
4. Span Condition: As indicated
5. Side Laps: Overlapped

2.3 NONCOMPOSITE FORM DECK

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. [ASC Profiles, Inc.; a Blue Scope Steel company.](#)
2. [Canam United States; Canam Group Inc.](#)
3. [Consolidated Systems, Inc.; Metal Dek Group.](#)
4. [Cordeck.](#)
5. [DACS, Inc.](#)
6. [Marlyn Steel Decks, Inc.](#)
7. [New Millennium Building Systems, LLC.](#)
8. [Nucor Corp.; Vulcraft Group.](#)
9. [Roof Deck, Inc.](#)
10. [Valley Joist; Subsidiary of EBSCO Industries, Inc.](#)

11. [Verco Manufacturing Co.](#)

- B. Noncomposite Form Deck: Fabricate ribbed-steel sheet noncomposite form-deck panels to comply with "SDI Specifications and Commentary for Noncomposite Steel Form Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
1. Galvanized-Steel Sheet: ASTM A 653, Grade 33
 2. Deck Profile: As indicated
 3. Profile Depth: As indicated
 4. Span Condition: As indicated
 5. Side Laps: Overlapped

2.4 ACOUSTICAL ROOF DECK

- A. [Manufacturers](#): Subject to compliance with requirements, provide products by one of the following:
1. [ASC Profiles, Inc.; a Blue Scope Steel company.](#)
 2. [Canam United States; Canam Group Inc.](#)
 3. [Consolidated Systems, Inc.; Metal Dek Group.](#)
 4. [Cordeck.](#)
 5. [DACS, Inc.](#)
 6. [Marlyn Steel Decks, Inc.](#)
 7. [New Millennium Building Systems, LLC.](#)
 8. [Nucor Corp.; Vulcraft Group.](#)
 9. [Roof Deck, Inc.](#)
 10. [Valley Joist; Subsidiary of EBSCO Industries, Inc.](#)
 11. [Verco Manufacturing Co.](#)
- B. Acoustical Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
1. Prime-Painted Steel Sheet: Grade 33 minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - a. Color: Gray
 2. Deck Profile: As indicated
 3. Cellular Deck Profile: As indicated
 4. Profile Depth: As indicated
 5. Design Uncoated-Steel Thickness: As indicated
 6. Design Uncoated-Steel Thicknesses; Deck Unit/Bottom Plate: As indicated
 7. Span Condition: As indicated
 8. Acoustical Perforations: Cellular deck units with manufacturer's standard perforated flat-bottom plate welded to ribbed deck.
 9. Sound-Absorbing Insulation: Manufacturer's standard premolded roll or strip of glass or mineral fiber.
 - a. Factory install sound-absorbing insulation into cells of cellular deck.
 10. Acoustical Performance: NRC 0.70, tested according to ASTM C 423.

2.5 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, **No. 10** minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of **33,000 psi**, not less than **0.0359-inch** design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- G. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.
- H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, **0.0598 inch** thick, with factory-punched hole of **3/8-inch** minimum diameter.
- I. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than **1-1/2 inches** long, and as follows:
 - 1. Weld Diameter: **5/8 inch**, nominal.
 - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds **12 inches** apart in the field of roof and **6 inches** apart in roof corners and perimeter, based on roof-area definitions in FMG Loss Prevention Data Sheet 1-28
 - 3. Weld Washers: Install weld washers at each weld location.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or **36 inches** and as follows:
 - 1. Mechanically fasten with self-drilling, **No. 10** diameter or larger, carbon-steel screws.
 - 2. Fasten with a minimum of **1-1/2-inch-** long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of **1-1/2 inches** with end joints as follows:
 - 1. End Joints: Lapped **2 inches** minimum
- D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- E. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

- B. Field welds will be subject to inspection.
- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.5 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.
 - 1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
 - 2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Division 9
- C. Repair Painting: Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in Section 099113 "Exterior Painting" and Division 9
- D. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Interior non-load-bearing wall framing.

B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for masonry shelf angles and connections.
- 2. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies.
- 3. Section 092216 "Non-Structural Metal Framing" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

C. This project is to be "LEED" certified and have the following requirements:

- 1. Recycle content minimum 25 percent post-consumer up to 90 percent where possible.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of cold-formed steel framing product and accessory.

B. LEED Submittals:

- 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

C. Shop Drawings:

- 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
- 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

D. Delegated-Design Submittal: For cold-formed steel framing.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Product Test Reports:
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.
- D. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- D. Comply with AISI S230 "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. [AllSteel & Gypsum Products, Inc.](#)
 - 2. [California Expanded Metal Products Company.](#)
 - 3. [ClarkWestern Building Systems, Inc.](#)

4. [Consolidated Fabricators Corp.](#); Building Products Division.
5. [Craco Mfg., Inc.](#)
6. [Custom Stud Inc.](#)
7. [Design Shapes in Steel.](#)
8. [Dietrich Metal Framing; a Worthington Industries Company.](#)
9. [Formetal Co. Inc. \(The\).](#)
10. [MarinoWARE.](#)
11. [Nuconsteel; a Nucor Company.](#)
12. [Olmar Supply, Inc.](#)
13. [Quail Run Building Materials, Inc.](#)
14. [SCAFCO Corporation.](#)
15. [Southeastern Stud & Components, Inc.](#)
16. [State Building Products, Inc.](#)
17. [Steel Construction Systems.](#)
18. [Steel Network, Inc. \(The\).](#)
19. [Steel Structural Systems.](#)
20. [Steele, Inc.](#)
21. [Super Stud Building Products, Inc.](#)
22. [Telling Industries, LLC.](#)
23. [United Metal Products, Inc.](#)
24. [United Steel Manufacturing.](#)

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.
- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 1. Design Loads: As indicated
 2. Deflection Limits: Design framing systems to withstand[**design loads**] without deflections greater than the following:
 - a. Interior Non-Load-Bearing Wall Framing: Horizontal deflection of **1/360** of the wall height under a horizontal load of **5 lbf/sq. ft.**
 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of **120 deg F (67 deg C)**.
 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of **1/2 inch.**
 5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Design Standards:
 1. Floor and Roof Systems: AISI S210.

2. Wall Studs: AISI S211.
3. Headers: AISI S212.
4. Lateral Design: AISI S213.

- D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
- E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 INTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: **0.0329 inch**
 2. Section Properties: as required
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: **0.0329 inch**
 2. Flange Width: **1-1/4 inches**
- C. Vertical Deflection Clips: Manufacturer's standard bypass clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. [AllSteel & Gypsum Products, Inc.](#)
 - b. [ClarkWestern Building Systems, Inc.](#)
 - c. [Dietrich Metal Framing](#); a Worthington Industries company.
 - d. [MarinoWARE](#).
 - e. [SCAFCO Corporation](#).
 - f. [Steel Network, Inc. \(The\)](#).
 - g. [Steeler, Inc.](#)
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
1. Minimum Base-Metal Thickness: **0.0428 inch**
 2. Flange Width: **1 inch** plus the design gap for one-story structures and **1 inch** plus twice the design gap for other applications

2.4 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.
 - 7. Gusset plates.
 - 8. Stud kickers and knee braces.
 - 9. Joist hangers and end closures.
 - 10. Hole reinforcing plates.
 - 11. Backer plates.

2.5 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36 threaded carbon-steel headless, hooked and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A 780

- B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, **1/4 inch** thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.7 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.
 - 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of **1/8 inch in 10 feet (1:960)** and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus **1/8 inch** from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of **1/8 inch**.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing 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.

3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.
- C. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than **1/4 inch (6 mm)** to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding **1/16 inch**.
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

- b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- J. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of **1/8 inch in 10 feet (1:960)** and as follows:
 - 1. Space individual framing members no more than plus or minus **1/8 inch (3 mm)** from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 INTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to **[top and]** bottom track unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: As indicated.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deep-leg deflection tracks and anchor to building structure.
 - 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Connect vertical deflection clips to **[bypassing] [infill]** studs and anchor to building structure.
 - 4. Connect drift clips to cold-formed metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than **48 inches** apart. Fasten at each stud intersection.

1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within **18 inches** of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
 - a. Install solid blocking at centers indicated on Shop Drawings.
 2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 05 50 00 - METAL FABRICATIONS AND STEEL STAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel framing and supports for ceiling-hung toilet compartments.
2. Steel framing and supports for operable partitions.
3. Steel framing and supports for countertops.
4. Steel tube reinforcement for low partitions.
5. Steel framing and supports for mechanical and electrical equipment.
6. Steel framing and supports for applications where framing and supports are not specified in other Sections.
7. Steel framing and supports for audio visual equipment
8. Sheet metal back-up for hanging casework shelving and marker boards
9. Shelf angles.
10. Metal ladders.
11. Ladder safety cages.
12. Alternating tread devices.
13. Structural-steel door frames.
14. Metal bollards.
15. Loose bearing and leveling plates for applications where they are not specified in other Sections.
16. Interior Stairs

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
2. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
3. Section 051200 "Structural Steel Framing."
4. Section 129300 "Site Furnishings" for bicycle racks.

D. This project is to be "LEED" certified and have the following requirements:

1. Structural Steel: Recycle content minimum 90 percent with at least 70% post-consumer.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Nonslip aggregates and nonslip-aggregate surface finishes.
2. Prefabricated building columns.
3. Metal nosings and treads.
4. Paint products.
5. Grout.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

C. Shop drawings for steel stairs and landings, ladders, audio visual framing and supports and support for casework shelving and marker boards shall be signed and sealed by a professional engineer licensed in the State of Maryland. Submit design calculations for steel stairs and landings, ladders, audio visual framing and supports and support for casework shelving and marker boards. Calculations shall be signed and sealed by a professional engineer licensed in the State of Maryland.

D. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
2. Laboratory Test Reports for Credit IEQ 4: For primers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

- B. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- D. Rolled-Stainless-Steel Floor Plate: ASTM A 793.
- E. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
- G. Aluminum Plate and Sheet: **ASTM B 209** Alloy 6061-T6.
- H. Aluminum Extrusions: **ASTM B 221** Alloy 6063-T6.

- I. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
- J. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

2.2 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or **ASTM F 1941** Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
 - 3. Provide stainless-steel fasteners for fastening nickel silver.
 - 4. Provide bronze fasteners for fastening bronze.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, **ASTM A 307, Grade A** with hex nuts, **ASTM A 563** and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, **ASTM A 563** and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- D. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- E. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- F. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or **ASTM F 1941**, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group **1 (A1)** or Group **2 (A4)** stainless-steel bolts, **ASTM F 593**, and nuts, **ASTM F 594**.

2.3 MISCELLANEOUS MATERIALS

- A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services) "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Shop Primers: Provide primers that comply with Division 9.

- C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- D. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- E. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- H. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of **3000 psi**.

2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately **1/32 inch** unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, **1/8 by 1-1/2 inches**, with a minimum **6-inch** embedment and **2-inch** hook, not less than **8 inches** from ends and corners of units and **24 inches** o.c., unless otherwise indicated.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Fabricate supports for operable partitions from continuous steel beams of sizes indicate with attached bearing plates, anchors, and braces as indicated. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.
- D. Galvanize miscellaneous framing and supports where indicated.

2.6 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive **3/4-inch** bolts, spaced not more than **6 inches** from ends and **24 inches** o.c., unless otherwise indicated.
 - 1. Provide mitered and welded units at corners.
 - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately **2 inches** larger than expansion or control joint.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize and prime shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with zinc-rich primer.
- E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.7 METAL LADDERS

A. General:

1. Comply with ANSI A14.3

B. Steel Ladders:

1. Space siderails **16 inches** apart unless otherwise indicated.
2. Siderails: Continuous, **3/8-by-2-1/2-inch** steel flat bars, with eased edges.
3. Rungs: **3/4-inch-** diameter
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
6. Provide nonslip surfaces on top of each rung by coating with abrasive material metallicly bonded to rung.
 - a. **Products:** Subject to compliance with requirements, provide one of the following
 - 1) Harsco Industrial IKG, a division of Harsco Corporation; Mebac.
 - 2) SlipNOT Metal Safety Flooring, a division of W. S. Molnar Company; SlipNOT.
7. Provide platforms as indicated fabricated from welded or pressure-locked steel bar grating, supported by steel angles. Limit openings in gratings to no more than **1/2 inch** in least dimension.
8. Support each ladder at top and bottom and not more than **60 inches** o.c. with welded or bolted steel brackets.
9. Prime exterior ladders, including brackets and fasteners

2.8 STRUCTURAL-STEEL DOOR FRAMES

- ### A.
- Fabricate structural-steel door frames from steel shapes, plates, and bars of size and to dimensions indicated, fully welded together, with **5/8-by-1-1/2-inch** steel channel stops, unless otherwise indicated. Plug-weld built-up members and continuously weld exposed joints. Secure removable stops to frame with countersunk machine screws, uniformly spaced at not more than **10 inches** o.c. Reinforce frames and drill and tap as necessary to accept finish hardware.

1. Provide with integrally welded steel strap anchors for securing door frames into adjoining concrete or masonry.

- ### B.
- Extend bottom of frames to floor elevation indicated with steel angle clips welded to frames for anchoring frame to floor with expansion shields and bolts.

- ### C.
- Prime steel frames with per Division 9.

2.9 MISCELLANEOUS STEEL TRIM

- ### A.
- Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
 - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Prime miscellaneous steel trim per Division 9.

2.10 METAL BOLLARDS

- A. Fabricate metal bollards from Schedule 40 steel pipe
 - 1. Cap bollards with **1/4-inch**- thick steel plate.
 - 2. Where bollards are indicated to receive controls for door operators, provide cutouts for controls and holes for wire.
 - 3. Where bollards are indicated to receive light fixtures, provide cutouts for fixtures and holes for wire.
- B. Fabricate bollards with **3/8-inch**- thick steel baseplates for bolting to concrete slab. Drill baseplates at all four corners for **3/4-inch** anchor bolts.
 - 1. Where bollards are to be anchored to sloping concrete slabs, angle baseplates for plumb alignment of bollards.
- C. Prime bollards with per Division 9.

2.11 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Prime plates per Division 9.

2.12 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than **8 inches** unless otherwise indicated.
- C. Prime loose steel lintels located in exterior walls per Division 9.

2.13 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from structural framing as needed to complete the Work. Provide each unit with no fewer than two anchors.

2.14 STEEL FRAMING AND SUPPORTS FOR AUDIO VISUAL EQUIPMENT

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from structural framing as needed to complete the Work. Provide each unit with no fewer than two anchors.

2.15 SHEET METAL BACK-UP FOR HANGING CASEWORK SHELVING AND MARKER BOARDS

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from structural framing as needed to complete the Work. Provide each unit with no fewer than two anchors.

2.16 INTERIOR STAIRS

- A. Delegated Design: Engage a qualified professional engineer
- B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Uniform Load: 100 lbf/sq. ft.
 - 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
 - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
 - 5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.
- C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
- D. Fire Stairs:
 - 1. Shop fabricated steel stairs with concrete-filled treads.
 - 2. Solid wood (maple) trim guardrails.
 - 3. 1/2" diameter solid round steel pickets
 - 4. satin stainless steel pipe handrails as detailed on the drawings.

5. Final assembly and welding in field

E. Curved Monumental Stair:

1. Shop fabricated steel stairs with curved structural channel steel with precast terrazzo treads mortared to steel pan treads.
2. Solid wood (maple) trim guardrails.
3. ½" diameter solid round steel pickets and satin stainless steel pipe handrails as detailed on the drawings.
4. Final assembly and welding in field.
5. See specification Section 05121 Architecturally Exposed Structural Steel Framing for Monumental Star curved channel framing.

2.17 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.18 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 1. Shop prime with universal shop primer
- D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.19 ALUMINUM FINISHES

- A. As-Fabricated Finish: AA-M12.
- B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 1. Cast Aluminum: Heavy coat of bituminous paint.
 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for ceiling hung toilet partitions and operable partitions securely to, and rigidly brace from, building structure.
- C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 - 1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.
- D. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.
 - 1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING PREFABRICATED BUILDING COLUMNS

- A. Install prefabricated building columns to comply with AISC 360, "Specifications for Structural Steel Buildings," and with requirements applicable to listing and labeling for fire-resistance rating indicated.

3.4 INSTALLING METAL BOLLARDS

- A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.
 - 1. Do not fill removable bollards with concrete.
- B. Anchor bollards to existing construction per drawings.

3.5 INSTALLING NOSINGS, TREADS, AND THRESHOLDS

- A. Center nosings on tread widths unless otherwise indicated.
- B. For nosings embedded in concrete steps or curbs, align nosings flush with riser faces and level with tread surfaces.
- C. Seal thresholds exposed to exterior with elastomeric sealant complying with Section 079200 "Joint Sealants" to provide a watertight installation.

3.6 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.7 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SECTION 05 58 60 – METAL COLUMN COVERS

PART 1 - GENERAL

1.01 Scope

A. Section Includes:

1. The extent of Column Covers as indicated on the drawings and in these specifications.
2. Column Cover requirements include the following components:
 - a. Vertical Reveal Column Covers. Column Cover mounting system including anchorages, shims, sealants, and misc. framing. No exposed fasteners will be accepted.
 - b. Metal-Lok Butt Joint Column Covers. Column Cover mounting system including anchorages, shims, and misc. framing. No exposed fasteners will be accepted.
 - c. Column Cover top & bottom trim rings, reveal trims, and batten strips.
 - d. Sound deadening tape.
 - e. Sound deadening Insulation.

B. RELATED DOCUMENTS:

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

C. RELATED WORK SPECIFIED ELSEWHERE:

1. Division 5: Structural Steel
2. Division 5: Cold Formed Metal Framing
3. Division 7: Caulking and Sealants
4. Division 7: Sprayed on Fireproofing

1.02 QUALITY ASSURANCE

1. Column Cover Fabricator shall have a minimum of 10 years experience in the manufacturing of this product.
2. Installer: Shall have experience installing Column Cover system similar to that required for a period of not less than 5 documented years.
3. Maximum deviation from vertical and horizontal alignment of erected panels: ¼ inch in 20 feet non-accumulative.
4. Column Cover fabricator/installer shall assume undivided responsibility for all components of the systems including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the Column Cover system.
5. Shop Drawings shall be prepared by the fabricator of the Column Cover system.

1.03 SUBMITTALS

A. Conformance:

1. Submittals shall be in conformance with this section and with the general conditions.

B. LEED SUBMITTALS:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

C. Samples:

1. Panel System Assembly: Two samples of typical assembly, 12" x 12" minimum.
2. Two samples of each color or finish selected, 3" x 4" minimum.

D. Shop Drawings:

Submit shop drawings showing project elevations, fastening and anchoring methods, detail and location of joints, sealants including joints necessary to accommodate thermal movements and construction tolerances, trim, and accessories.

1.04 WARRANTY

A. submit in accordance with division 1 – closeout submittals.

B. WORKMANSHIP WARRANTY:

1. Written warranty signed by manufacturer and installer warranting that portions of the work involving metal panels are of good quality, free from defects, and in conformance with the requirements of the Contract Documents. Further guarantee to repair or replace defective work during a one year period following Substantial Completion of the work.
2. Defective is defined to include failure of the system to meet structural performance requirements and/or permanent deformation resulting from pressures within the design criteria.

C. FINISH WARRANTY:

1. Written warranty signed by manufacturer warranting that the painted finish will not develop excessive fading or excessive non-uniformity of color or shade, and will not crack, pit, peel, corrode, or otherwise fail as a result of defect in materials and workmanship. Further guarantee to repair or replace defective work during a ten year period following substantial completion of the work. Upon notification of defects within the warranty period, make necessary repairs or replacement at the convenience of the owner.

D. Warranty shall specifically include the applicable work of the following sections of the specifications.

1. Section 07900 - Joint Sealants

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Deliver units and other components so they will not be subject to damage or deformation. Deliver Column Cover units in crates designated for specific locations on the building as coordinated between GC and installer. Crates shall be able to withstand hoisting loads relevant to the project.
- B. Storage: Stack components off the ground/floor on suitable skids in fully enclosed space. Protect against warpage, scratches, damage from moisture, exposure to direct sunlight and other surface contamination.
- C. Handling: Exercise care in loading, unloading, storing, and installing units so as to preclude bending, warping, twisting, and surface damage.

PART 2 - PRODUCTS

2.01 COLUMN COVERS

A. COLUMN COVER SYSTEMS:

1. Fabricators offering products which may be incorporated in the work, but are not limited to, the following:
 - a. Basis of Design is Metalwërks® Vertical Reveal Column Covers and/or Metal-Lok Butt Joint Column Covers by Metal Sales & Service Inc. of Kennett Square, Pa 19348 (800-321-7816 or website: www.metalwerksusa.com).
 - b. Tech Wall Column Covers by Alply Architectural Building Systems, LLC.Box 538 DeKalb, MS 39328. Tel: 601-743-2493.
 - c. Pittcon Industries.
 - d. Equal product by an equal manufacturer.
2. Vertical Reveal Column Covers: Round shape column covers can be rolled as small as 12 ½" in diameter with a maximum length of 16'. Square and rectangular shape covers can be formed up to 13' optimal lengths and widths are restricted only by flat stock availability. Other lengths are available, consult Sales Dept. for limitations. Longer lengths of all column covers are available by adding joints.
 - a. Vertical Reveal Column Covers are recommended for both interior and exterior applications.
 - b. Column Cover joints will be sealed in the field with a nominal 5/8" joint sealer consisting of backer rod and caulking as recommended by the panel system supplier to meet system performance requirements.
 - c. Column Cover fasteners shall be type 305 stainless steel or cadmium plated for attachment in size and spacing as dictated by structural requirements.
 - d. Cold formed metal framing, as required, formed to sizes indicated in minimum #16 gage G-90 galvanized steel.
3. Metal-Lok Butt Joint Column Covers: Curved or elliptical shaped column covers can be rolled as small as 12 ½" in diameter with a maximum length of 16'. Square and rectangular shape covers can be formed to 13' lengths and widths are restricted only by flat stock availability. Other lengths are available, consult Sales Dept. for limitations. Longer lengths of all column covers are available by adding joints.
 - a. If weather tightness is an issue we do not recommend using this design on an exterior application.
 - b. The metal-lok design requires a minimum ¼" gap at the top of the column cover for the Metal-Lok keyhole design installation.
 - c. Panel fasteners shall be type 304 stainless steel or cadmium plated for panel attachment in size and spacing as dictated by structural requirements.
 - d. Cold formed metal framing, as required, formed to sizes indicated in a minimum #16 gage G-90 galvanized steel.

1.02 MATERIALS

A. GENERAL:

1. Select materials for surface flatness, smoothness, and freedom from surface blemishes where exposed to view in the finished system.

METAL COLUMN COVERS

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2. Aluminum Sheet with minimum thickness of .125" with strength and durability properties specified in ASTM B 209 for 3003H-14 or 5005-H32AQ alloys.
3. Stainless Steel Sheet shall be type 304 in thicknesses of #18 gage, #16 gage, and #14 gage. Stainless steel is available in various textures and finishes, consult Sales Dept. for options.
4. Manufacturer's recommended sound deadening tape, shipped loose to be field applied.

2.03 FINISHES

- A. Fluoropolymer Three Coat Coating System: Manufacturer's standard three coat, thermo-cured system composed of specially formulated inhibitive primer, fluorocarbon color coat, and a clear fluorocarbon topcoat (applicable with three coat system). Both color coat and clear topcoat shall contain not less than 70% polyvinylidene resin by weight in compliance with AAMA 2605 for testing, performance, and application procedures.
 1. Panels shall be chemically etched by an appropriate cleaner in accordance with manufacturer's written instructions.
 2. Apply acid resistant primer to cleaned aluminum. Thickness range; 0.20 to 0.30 mils.
 3. Apply polyvinylidene fluoride (PVF2) resinated color coat. Thickness range; 0.8 to 1.2 mils.
 - a. Kynar 500. Must be applied by certified Kynar coater.
 4. Apply clear top coat finish as extra protection, no less than 0.8 mils thick. Comply with AAMA standards.
 5. Color: Custom color to match architect's sample, or if none, from manufacturer's standard selection.

PART 3 - EXECUTION

3.01 INSPECTION

1. Surfaces to receive Column Covers shall be sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.
2. Surfaces to receive Column Covers shall be structurally sound as designed by the project Architect/Engineer.

3.02 INSTALLATION

1. Column Covers shall be erected plumb, level, square, true to line, securely anchored and in proper alignment to work of other trades.
3. Column Covers shall be erected in accordance with an approved set of shop drawings.
4. Do not cut, trim, weld, or braze parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return parts which require alteration to shop for re-fabrication, if possible, or for replacement with new parts.
5. Separate dissimilar metals where needed to eliminate the possibility of corrosive or electrolytic action between materials.

6. Installation Tolerances: Shim and align panel units within installed tolerances of 1/4 inch in 20 feet, non-cumulative, on level/plumb/slope and location/line as indicated, and within 1/16 inch offset of adjoining faces and of alignment of matching profiles.

1.03 ADJUSTING AND CLEANING

1. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the General Contractor.
2. Repair panels with minor damage.
3. Remove protective film as soon as possible after installation.
4. Any additional protection, after installation, shall be the responsibility of the General Contractor.
5. Final cleaning shall not be part of the work of this section.

END OF SECTION

SECTION 05 73 00 – DECORATIVE METAL RAILING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide ornamental guardrails and railings where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Section Includes:
 - 1. Interior railing system at Monumental stair.
- C. Similar work is specified as follows:
 - 1. Steel pipe and tube handrails and railing systems not attached to metal stairs or to walls adjacent to metal stairs are specified in Division 5 Section Metal Fabrications.
- D. Products Furnished but not Installed under this Section:
 - 1. Cast-in-place anchors, inserts, and similar anchorage devices specified under other sections.
- E. Related Documents/Sections: Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:
 - 1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
 - 2. Division 3 Section - Cast-In-Place Concrete.

1.3 DEFINITIONS

- A. Definitions in ASTM E 985 for railing-related terms apply to this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General: In engineering guardrail and railing systems to withstand structural loads indicated, determine allowable design working stresses of materials based on the following:
 - 1. Cold Formed Structural Steel: ANSI "Specifications for the Design of Cold-Formed Steel Structural Members".
- B. Structural Performance of Guardrails and Railing Systems: Engineer, fabricate, and install guardrails and railing systems to withstand the following structural loads without exceeding the allowable design working stress of the materials for guardrails, railing systems, anchors, and connections. Apply each load to produce the maximum stress in each of the respective components comprising guardrails and railing systems.

1. Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf per linear foot (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf per linear foot (1460 N/m) applied vertically downward.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
 2. Guardrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf per linear foot (730 N/m) applied in any direction.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
 3. Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lbf (890 N) applied to 1 sq. ft. (0.09 sq. m) at any point in the system, including panels, intermediate rails, balusters, or other elements composing the infill area.
 - a. Above load need not be assumed to act concurrently with loads on top rails of railing systems in determining stress on guard.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.5 SUBMITTALS

A. General:

1. Identify proposed changes, differences, and discrepancies, including verbiage, terms, and definitions, between Contract Documents and submittals.

B. LEED Submittals:

1. Product Data for Credit MR 4.1[and Credit MR 4.2]: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

C. Product Data:

1. For each type of product indicated, submit manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - a. Submit data for mechanically connected guardrails and railing systems, each kind of fitting and paint products.

D. Shop Drawings:

1. Submit drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
 - a. Show fabrication and installation of guardrails and railing systems including plans, elevations, sections, details of components, and attachments to other units of Work.

- b. For installed guardrails and railing systems indicated to comply with certain design loadings, include structural analysis data sealed and signed by the qualified professional engineer who was responsible for their preparation.

E. Samples:

- 1. Samples for Initial Selection:
 - a. Samples in the form of short sections of railing or flat sheet metal samples showing available mechanical finishes.
- 2. Samples for Verification Purposes:
 - a. Assembled finished sample of railing system, made from full-size components, including top rail, post, guardrail, and infill. Show finishing of members at intersections.
 - b. 6-inch-long sections of each distinctly different linear railing member, including guardrails, top rails, posts, and intermediate members.
 - c. Welded connections.
 - d. Each different fitting and bracket.

F. Quality Control Submittals:

- 1. Tests:
 - a. Product test reports from a qualified independent testing agency evidencing compliance of guardrails and railing systems with requirements based on comprehensive testing of current products.
- 2. Certificates:
 - a. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - b. Welder certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.
- 3. Qualification Data:
 - a. Submit data for firms and persons specified under "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project name(s), address(es), names of Architect(s) and Owner(s), plus other specified information. This must be approved by the architect.
- 4. Manufacturer's Instructions:
 - a. Submit manufacturer's recommended installation procedures which, when reviewed by the Architect, may become the basis for accepting or rejecting actual installation procedures used on the work.

G. Contract Closeout Submittals:

- 1. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Architect requisite copies of the following:

- a. Project Record Documents.
- b. Operation and Maintenance Data.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- B. Single-Source Responsibility: Obtain guardrails and railing systems of each type and material from a single manufacturer.
- C. Engineer Qualifications: A professional engineer legally authorized to practice in the jurisdiction where Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of guardrails and railing systems similar to this Project in material, design, and extent and that have a record of successful in-service performance.
- D. Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.
 - 1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests (AWS D1.2) and can document a minimum of five years successful experience in aluminum TIG welding.
 - 2. If recertification of welders is required, retesting will be Contractor's responsibility.

1.7 STORAGE

- A. Store guardrails and railing systems inside a well-ventilated area, away from uncured concrete and masonry and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Where guardrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating guardrails and railing systems without field measurements. Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.9 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate installation of guardrails as follows:
 - 1. Mount guardrails only on completed Work. Do not support guardrails temporarily by any means not satisfying structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Railings: Subject to compliance with requirements provide railing systems by one of the following:
1. Interior Railing System:
 - a. McNichols Company
9070 Junction Dr. #M
Annapolis Junction, MD 20701-1141
Tel: 1.877.884.4653
 - b. Architectural Metal Works.
 - c. Architectural Railings & Grilles, Inc.
 - d. Blum, Julius & Co., Inc.
 - e. Blumcraft of Pittsburgh.
 - f. CraneVeyor Corp.
 - g. Livers Bronze Co.
 - h. Wagner, R & B, Inc.; a division of the Wagner Companies.

2.2 METALS

- A. General: Provide metal free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- C. Steel: Provide steel and iron in the form indicated complying with the following requirements:
- a. Steel Tubing: Product type (manufacturing method) and other requirements as follows:
 - 1) Cold-Formed Steel Tubing: ASTM A 500, grade as indicated below:
 - 2) Grade A, unless otherwise indicated or required by structural loads.
 - 3) Hot-Formed Steel Tubing: ASTM A 501.
 - 4) Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - b. Steel Tube Posts: ½" x 2 ½" square steel powder coated in shop.
 - c. Solid steel pickets: ½" diameter solid round powder coated in shop.
 - d. Wood Toprail: 2" diameter round solid wood (Maple) trim.
- D. Brackets, Flanges, and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
1. Railing brackets mounted on steel posts: McNichols, stainless steel No. 304.
 2. Adapter for Wall Brackets mounted on steel posts; McNichols handrail adapter. Brushed stainless steel No. 304.
- E. Ornamental Grade Stainless Steel No. 304 Finish Handrail Mouldings:

1. McNichols 1 ½" nominal schedule 40 handrail pipe.
2. Ornamental Grade Finish finished and polished by the shop fabricator.
3. Handrail O.D. = 1.660".
4. Provide McNichols Connector pieces to be utilized with shop welded connections.
5. Provide custom welded closed end caps.

2.3 MISCELLANEOUS MATERIALS

- A. Filler Metal and Electrodes: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded or brazed and as required for color match, strength, corrosion resistance, and compatibility in fabricated items.

2.4 FASTENERS

- A. Fasteners for Anchoring Railings to Other Construction: Select fasteners of the type, grade, and class required to produce connections that are suitable for anchoring railing to other types of construction indicated and capable of withstanding design loadings.

1. Provide fasteners fabricated from type 304 or type 316 stainless steel.

- B. Interconnecting Railing Components:

1. Provide structural TIG welds.

- C. Cast-in-Place and Postinstalled Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Cast-in-place anchors.

- D. For steel railings and fittings, use plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

2.5 PAINT

- A. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers.
- B. Shop Primers for Steel: Provide primers complying with applicable requirements of Division 9 Section "Painting".

2.6 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

- B. Products: Subject to compliance with requirements, provide one of the following:

1. B-6 Construction Grout; W. R. Bonsal Co.
2. Euco N-S Grout; Euclid Chemical Co.

3. Masterflow 928 and 713; Master Builders Technologies, Inc.
4. SonogROUT 14; Sonneborn Building Products--ChemRex, Inc.

2.7 FABRICATION

- A. Fabricate guardrails and railing systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of hollow members, post spacings, and anchorage, but not less than that required to support structural loads.
- B. Assemble railing systems and guardrails by use of structural TIG welds (both shop and field).
 1. Obtain fusion without undercut or overlap.
 - a. Bevel edges as required to allow deep penetration.
 - b. Provide sufficient weld depth on front and back intersecting surfaces to allow welds to be ground smooth and flush for architectural quality appearance and to maintain structural adequacy.
 2. Remove welding flux immediately.
 3. Finish exposed welds and surfaces so that no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Form changes in direction of railing members as indicated.
- D. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated.
- E. Close exposed ends of guardrail and railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted guardrails, unless otherwise indicated. Close ends of returns unless clearance between end of the railing and wall is 1/4 inch (6 mm) or less.
- G. Provide internal weep holes at intersections to allow discharge of moisture.
- H. Assemble railing systems in shop to the greatest extent possible to minimize field splicing and assembly.
 1. Disassemble units only as necessary for shipping and handling limitations.
 2. Clearly mark units for reassembly and coordinated installation.
- I. Provide brackets, flanges, miscellaneous fittings, and anchors to connect guardrail and railing members to other construction.
- J. Provide inserts and other anchorage devices to connect guardrails and railing systems to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by guardrails and railing systems. Coordinate anchorage devices with supporting structure.
- K. For steel railings to be radius bends as shown on the drawings.

2.8 FINISHES, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering prior to shipment.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one half of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and they are assembled or installed to minimize contrast.
- D. Finish: Stainless Steel No.4 Directional Finish.**

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installing anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors, that are to be embedded in concrete as masonry construction. Coordinate delivery of such items to Project site.

3.2 INSTALLATION, GENERAL

- A. Fit field connections accurately together to form tight, hairline joints.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing guardrails and railings. Set guardrails and railings accurately in location, alignment, and elevation, measured from established lines and levels and free from rack.
 - 1. Do not weld, cut, or abrade surfaces of guardrails and railing components that have been coated or finished after fabrication and are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/4 inch in 12 feet (2 mm in 1 m).
 - 3. Align rails so that variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (2 mm in 1 m).
- C. Shop and Field Welding:
 - 1. Assemble railing systems and guardrails by use of structural TIG welds (both shop and field).
 - 2. Obtain fusion without undercut or overlap.
 - a. Bevel edges as required to allow deep penetration.
 - b. Provide sufficient weld depth on front and back intersecting surfaces to allow welds to be ground smooth and flush for architectural quality appearance and to maintain structural adequacy.
 - 3. Remove welding flux immediately.
 - 4. Finish exposed welds and surfaces so that no roughness shows after finishing and welded surface matches contours and color of adjoining surfaces.
- D. Adjust guardrails and railing systems prior to anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated but not less than that required by structural loads.

- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing guardrails and railings systems and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components by welding. Cope or butt components to provide 100 percent contact, or use fittings designed for this purpose.

3.4 ATTACHING GUARDRAILS TO WALLS

- A. Attach guardrails to wall with wall brackets and end fittings. Provide bracket with 1-1/2-inch (38-mm) clearance from inside face of guardrail and finished wall surface.
- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets and wall return fittings to building construction as follows:

3.5 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material.

3.6 PROTECTION

- A. Protect finishes of railing systems and guardrails from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at the time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 73 00

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. For use in conjunction with rooftop equipment bases and support curbs.
3. Wood blocking, cants, and nailers.
4. Wood furring and grounds.

1.3 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- C. Timber: Lumber of 5 inches nominal (114 mm actual) or greater in least dimension.
- D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 2. NLGA: National Lumber Grades Authority.
 3. RIS: Redwood Inspection Service.
 4. SPIB: The Southern Pine Inspection Bureau.
 5. WCLIB: West Coast Lumber Inspection Bureau.
 6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include

physical properties of treated materials based on testing by a qualified independent testing agency.

3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

- B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

- B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Power-driven fasteners.
5. Powder-actuated fasteners.
6. Expansion anchors.
7. Metal framing anchors.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

- B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, 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 lumber.
 - 4. Provide dressed lumber, S4S, unless otherwise indicated.
- C. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- D. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
 - 1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. 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.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
 5. Wood floor plates that are installed over concrete slabs-on-grade.
- E. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- F. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by testing agency.
- G. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- H. Application: Treat items indicated on Drawings, and the following:
1. Plywood backing panels.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated or required, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Use treatment that does not promote corrosion of metal fasteners.
 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by testing agency.
 - E. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
 - F. Application: Treat items indicated on Drawings, and the following:
 1. Plywood backing panels.
- 2.4 DIMENSION LUMBER FRAMING
- A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.
 1. Application: Interior partitions not indicated as load-bearing.
 2. Species:
 - a. Hem-fir (north); NLGA.
 - b. Spruce-pine-fir; NLGA.
 - c. Hem-fir; WCLIB, or WWPA.
 - d. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
 - B. Load-Bearing Partitions: No. 2 grade.
 1. Application: Exterior walls and interior load-bearing partitions.
 2. Species:
 - a. Spruce-pine-fir; NLGA.
 - C. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.
 1. Species:
 - a. Spruce-pine-fir; NLGA.
 - D. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
 1. Application: Exposed exterior and interior framing.
 2. Species and Grade: Douglas fir-larch; No. 1 grade.
- 2.5 MISCELLANEOUS LUMBER
- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
 4. Cants.
 5. Furring.

6. Grounds.
7. Utility shelving.

- B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber of any species.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.7 METAL FRAMING ANCHORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Cleveland Steel Specialty Co.
 2. KC Metals Products, Inc.
 3. Phoenix Metal Products, Inc.
 4. Simpson Strong-Tie Co., Inc.
 5. USP Structural Connectors.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. 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.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
1. Use for interior locations unless otherwise indicated.
- D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
1. Use for wood-preserved-treated lumber and where indicated.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304.
1. Use for exterior locations and where indicated.
- F. Bridging: Rigid, V-section, nailless type, 0.050 inch (1.3 mm) thick, length to suit joist size and spacing.

2.8 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- (38-mm actual-) thickness.
 - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
 - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.
- I. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
 2. Use copper naphthenate for items not continuously protected from liquid water.
- K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. NES NER-272 for power-driven fasteners.
 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- M. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
1. Comply with indicated fastener patterns where applicable.
 2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
 3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preserved-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring horizontally or vertically at 24 inches (610 mm) o.c.

- C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring vertically at 16 inches (406 mm) o.c.

3.4 WALL AND PARTITION FRAMING INSTALLATION

- A. General: Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction unless otherwise indicated.
 - 1. For exterior walls, provide 2-by-6-inch nominal- (38-by-140-mm actual-) size wood studs spaced 16 inches (406 mm) o.c. unless otherwise indicated.
 - 2. Provide continuous horizontal blocking at midheight of partitions more than 96 inches (2438 mm) high, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.
- B. Construct corners and intersections with three or more studs.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
 - 1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal (89-mm actual) depth for openings 48 inches (1200 mm) and less in width, 6-inch nominal (140-mm actual) depth for openings 48 to 72 inches (1200 to 1800 mm) in width, 8-inch nominal (184-mm actual) depth for openings 72 to 120 inches (1800 to 3000 mm) in width, and not less than 10-inch nominal (235-mm actual) depth for openings 10 to 12 feet (3 to 3.6 m) in width.
 - 2. For load-bearing walls, provide double-jamb studs for openings 60 inches (1500 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated.

3.5 FLOOR JOIST FRAMING INSTALLATION

- A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches (38 mm) of bearing on wood or metal, or 3 inches (76 mm) on masonry. Attach floor joists as follows:
 - 1. Where supported on wood members, by using metal framing anchors.
 - 2. Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.
- B. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches (1200 mm).
- C. Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than 1/3 depth of joist; do not locate closer than 2 inches (50 mm) from top or bottom.
- D. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist at ends of joists unless nailed to header or band.

- E. Provide solid blocking between joists under jamb studs for openings.
- F. Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.
 - 1. Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.
- G. Provide bridging of type indicated below, at intervals of 96 inches (2438 mm) o.c., between joists.
 - 1. Diagonal wood bridging formed from bevel-cut, 1-by-3-inch nominal- (19-by-64-mm actual-) size lumber, double-crossed and nailed at both ends to joists.
 - 2. Steel bridging installed to comply with bridging manufacturer's written instructions.

3.6 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 00

SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Wall mounted sheathing for electrical panels.
2. Fire-retardant-treated plywood.
3. Cementitious backer units.
4. Exterior glass matt gypsum wall sheathing.
5. Roof sheathing for use as blocking at parapet walls and window openings.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for plywood backing panels.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. LEED Submittals:

1. Certificates for Credit MR 6 and Credit MR 7: Chain-of-custody certificates indicating that products specified to be made from certified wood comply with forest certification requirements. Include documentation that manufacturer is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.

2. Product Data for Credit EQ 4.1: For adhesives, documentation including printed statement of VOC content.
3. Product Data for Credit EQ 4.4: For composite wood products, documentation indicating that product contains no urea formaldehyde.
4. Laboratory Test Reports for Credit EQ 4: For adhesives and composite-wood products, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For following products, from ICC-ES:

1. Preservative-treated plywood.
2. Fire-retardant-treated plywood.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory."

2.2 WOOD PANEL PRODUCTS

- A. Emissions: Products shall meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

- B. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.
- C. Oriented Strand Board: DOC PS 2.
- D. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- E. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings.

2.4 FIRE-RETARDANT-TREATED PLYWOOD

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Use treatment that does not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber plywood shall be tested according ASTM D 5516 and design value adjustment factors shall be calculated according to ASTM D 6305. Span ratings after treatment shall be not less than span ratings specified.
- C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

- E. Application: Treat plywood indicated on Drawings, and the following: Revise list below to suit local code and Project.

1. Subflooring and underlayment in rated floor-ceiling assemblies.

2.5 WALL SHEATHING FOR TOILET ROOMS

- A. Cementitious Backer Units: ASTM C 1325, Type A.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Custom Building Products; Wonderboard.
 - b. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
 - c. USG Corporation; DUROCK Cement Board.

2.6 EXTERIOR WALL SHEATHING

- A. Cementitious Backer Units: ASTM C 1325, Type A.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Custom Building Products; Wonderboard.
 - b. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
 - c. USG Corporation; DUROCK Cement Board.

- B. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corporation; GlasRoc.
 - b. G-P Gypsum Corporation; Dens-Glass Gold.
 - c. Temple-Inland Inc.; GreenGlass
 - d. United States Gypsum Co.; Securock.
2. Type and Thickness: Type X, 5/8 inch thick.
3. Size: 48 by 96 inches for vertical installation.

2.7 ROOF SHEATHING FOR USE AS BLOCKING AT PARAPET WALLS

- A. Plywood Roof Sheathing: Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 32/16.
2. Nominal Thickness: Not less than 5/8 inch (15.8 mm).
3. APA Rated Sheathing, 48/24, Exposure 1, Square Edge with Spacer Type Clips to insure 1/8" spacing between panels- Provide 2 Clips between every pair of roof rafters/trusses to enhance the edge support of the plywood.

2.8 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.

2.9 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Glass-Mat Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 079200 "Joint Sealants."
- B. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
 - 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches (50 mm) wide, 10 by 10 or 10 by 20 threads/inch (390 by 390 or 390 by 780 threads/m), of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

2.10 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
 - 1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Wall Sheathing at Electrical Room.

3.3 CEMENTITIOUS BACKER UNIT INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to wood framing with screws.
 - 2. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 3. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
 - 4. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

- C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each steel stud.
 - 1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.
 - 2. For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

- D. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.
 - 1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.
 - 2. For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

- E. Seal sheathing joints according to sheathing manufacturer's written instructions.
 - 1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
 - 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.5

END OF SECTION 061600

SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Interior standing and running trim.
 - 2. Interior frames and jambs.
 - 3. Plastic-laminate cabinets.
 - 4. Plastic-laminate countertops.
 - 5. Closet and utility shelving.
 - 6. Shop finishing of interior woodwork
 - 7. Interior solid surface window sills
 - 8. Refinishing of salvaged tongue & groove wood flooring.
 - 9. Veneer plywood at benches.
 - 10. Veneer MDF Wall Panels (Add Alternate).
 - 11. Finish solid wood handrails.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for wood blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
 - 2. Division 7 Sealants.
 - 3. Division 9 Painting.
 - 4. Division 5 Metal Railing Systems

1.3 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.4 SUBMITTALS

- A. Product Data: For panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate, solid-surfacing material, fire-retardant-treated materials, cabinet hardware and accessories, handrail brackets, and finishing materials and processes.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. LEED Submittals:
1. Product Data for Credit EQ 4.1: For installation adhesives, including printed statement of VOC content.
 2. Product Data for Credit EQ 4.4:
 3. For each composite-wood product used, documentation indicating that the bonding agent contains no urea formaldehyde.
 4. For each adhesive used, documentation indicating that the adhesive contains no urea formaldehyde.
 5. Product Data for Credits MR 4.1 and MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content
 6. Include statement indicating costs for each product having recycled content.
 7. Certificates for Credit MR 7: Chain-of-custody certificates certifying that products specified to be made from certified wood comply with forest certification requirements. Include evidence that mill is certified for chain of custody by an FSC-accredited certification body.
 8. Include statement indicating costs for each certified wood product.
- C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Show details full size.
 2. Show locations and sizes of blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 3. Show locations and sizes of cutouts and holes for other items installed in architectural woodwork.
 4. Apply AWI-certified compliance label to first page of Shop Drawings.
- D. Samples for Initial Selection:
1. Shop-applied transparent finishes (on board and veneer panels).
 2. Plastic laminates (PVC edgings not permitted for exposed surfaces).
 3. Thermoset decorative panels (for cabinet interiors and other non-exposed surfaces).
 4. Solid-surfacing materials.
- E. Samples for Verification:
1. Lumber with or for transparent finish, not less than [50 sq. in.] [5 inches wide by 24 inches long], for each species and cut, finished on 1 side and 1 edge.
 2. Veneer-faced panel products with or for transparent finish, [8 by 10 inches] [12 by 24 inches], for each species and cut. Include at least one face-veneer seam and finish as specified.
 3. Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish, with 1 sample applied to core material] [and specified edge material applied to 1 edge].
 4. Thermoset decorative-panels, 8 by 10 inches, for each type, color, pattern, and surface finish, with edge banding on 1 edge.
 5. Solid-surfacing materials, 6 inches square.
- F. Product Certificates: For each type of product, signed by product manufacturer.

- G. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- H. Qualification Data: For fabricator/installer.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.
- B. Installer Qualifications: Fabricator of products and certified participant in AWI's Quality Certification Program..
- C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers and transparent-finished wood doors that are required to be of same species as woodwork.
- D. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
 - 1. Provide AWI Quality Certification Program labels and certificates indicating that woodwork, including installation, complies with requirements of grades specified.
 - 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with such selections and requirements in addition to the quality standard.
- E. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.
- F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
 - 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Species and Cut for Transparent Finish: Plain-sliced White Maple at locations indicated.
- C. Wood Species for Opaque Finish: Any closed-grain hardwood.
- D. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
 - 3. Particleboard: ANSI A208.1, Grade M-2.
 - 4. Softwood Plywood: DOC PS 1[, Medium Density Overlay].
 - 5. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.
- E. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
 - 1. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semiexposed edges.

- F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.
1. Manufacturers: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
 - a. Formica Corporation.
 - b. Nevamar Company, LLC; Decorative Products Div.
 - c. Pionite
 - d. Wilsonart International; Div. of Premark International, Inc.
- G. Wood Veneer Wall Panels (Add Alternate).
1. General:
 - a. Comply with AWI 200 panel grading rules for Premium Grade Work.
 - b. Provide thicknesses as indicated; if not indicated, provide minimum thicknesses required by AWI for Premium Grade Work.
 2. Panel Core Material:
 - a. Mat-formed wood particleboard, 45 pound density, complying with AWI 200-G-2.
 - b. Thickness: $\frac{3}{4}$ "
 - c. Fire Retardant Treated
 - d. Flame Spread: 20.
 - e. Representative Product: Duraflake.
 - f. Recycled content: Duraflake contains 100% Recycled/Recovered Wood Content.
 3. Veneer faced cleats at panel joints:
 - a. $\frac{3}{4}$ " Medium Density Fiberboard:
 4. Metal Strapping:
 - a. Provide over drywall substrate at panel joints:.
 - b. Contractor's option to use Zip-It Wall Anchors.
 5. Exposed Plywood for Painted Finish:
 - a. Provide panels bearing grade-trademark of American Plywood Association.
 - b. Grades: APA EXT A-C where one side is exposed; AOA EXT C-C for fully concealed uses.
 6. Panel Facing Material –Hardwood Veneer for Transparent Finish:
 - a. Species: GRADE 1, Flat Cut (Plain Sliced) White Maple.
 - b. Cut: Flat cut consistent clear, no sapwood, no blemishes.
 - c. Matching of adjacent veneer leaves: Bookmatch.
 - d. Matching within panel face: End Match to Adjacent Panels above and below.
 - e. Wood veneer to be by one of the following:

- 1) Crown Hardwood Veneer Corp., West Grove, PA (phone: 610-869-8771) or equal by one of the following:
 - 2) Dooge Veneers, Inc. Grand Rapids, MI (phone: 616-698-6450).
 - 3) Bacon Veneer, Chicago, IL (N.Y. phone: 212-213-5200).
- f. Finish system: Provide AWI System #TR-4, Conversion Varnish with clear natural finish.
- 1) Class A Flame Spread, Class 1 Finish Fire Rating.

2.2 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening (unless otherwise impractical), self-closing.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
- D. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter, brushed stainless (typical).
- E. Catches: as indicated.
- F. Adjustable Shelf Standards and Supports: as indicated.
- G. Shelf Rests: as indicated
- H. Drawer Slides: BHMA A156.9, B05091.
 1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-overtravel-extension type; zinc-plated steel ball-bearing slides.
- I. Door Locks: BHMA A156.11, E07121.
- J. Drawer Locks: BHMA A156.11, E07041.
- K. Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
 1. Product: Subject to compliance with requirements, provide by Doug Mockett & Company, Inc.
- L. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 1. US32D, Satin Stainless steel.
- M. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.3 INTERIOR SOLID SURFACE WINDOW SILLS

SwanStone, or equal:

1. A reinforced solid surface sill. Compression molded compound that consists of a blend of polymer resins, fillers and reinforcement additives.
2. Swan Corporation, 515 Olive St., Suite 1800 • St. Louis, MO 63101 • (800) 325-7008

2.4 MISCELLANEOUS MATERIALS

- A. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- B. Handrail Brackets: As indicated, with wall flange drilled and tapped for concealed hanger bolt and with support arm for screwing to underside of rail. Sized to provide 1-1/2-inch clearance between handrail and wall.

2.5 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Unless otherwise indicated, provide Premium-grade interior woodwork complying with referenced quality standard.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch Thick or Less: 1/16 inch.
 2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.
 3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.
- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or

roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of openings in countertops with a coat of varnish.

F. Install glass to comply with applicable requirements in Division 8 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

2.6 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

A. Grade: Premium.

B. Wood Species: Any closed-grain hardwood.

2.7 PLASTIC-LAMINATE CABINETS

A. Grade: Premium

B. AWI Type of Cabinet Construction: Flush overlay.

C. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:

1. Horizontal Surfaces Other Than Tops: Grade [HGS] .
2. Postformed Surfaces: Grade [HGP].
3. Vertical Surfaces: Grade [HGS].
4. Edges: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.

D. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS or Thermoset decorative panels.
 - a. Edges of Plastic-Laminate Shelves: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.
 - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade [VGS] .

E. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

F. Colors, Patterns, and Finishes:

1. As selected by Architect from manufacturer's full range.

G. Provide dust panels of 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers, unless located directly under tops

2.8 PLASTIC-LAMINATE COUNTERTOPS

- A. Grade: Premium.
- B. High-Pressure Decorative Laminate Grade: HGS.
- C. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. As selected by Architect from manufacturer's full range
- D. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- E. Core Material: Particleboard or medium-density fiberboard. Provide exterior-grade plywood at sink counters.
- F. Backer Sheet: Provide plastic-laminate backer sheet, Grade BKL, on underside of countertop substrate.

2.10 CLOSET AND UTILITY SHELVING

- A. Grade: Custom.
- B. Shelf Material: 3/4-inch plastic veneer-faced panel product.
- C. Cleats: Adjustable.

2.11 SHOP FINISHING

- A. Grade: Provide finishes of same grades as items to be finished.
- B. General: Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- C. General: Shop finish transparent-finished interior architectural woodwork at fabrication shop as specified in this Section. Refer to Division 9 painting Sections for finishing opaque-finished architectural woodwork.
- D. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

2.12 REFINISHING OF SALVAGED WOOD FLOORING FOR VERTICAL WALL AND HORIZONTAL FLOOR INSTALLATIONS

- A. Refinishing of Salvaged Tongue and Groove Wood Flooring
 - 1. Remove the existing polyurethane finish from salvaged wood flooring down to bare wood.
 - 2. Prepare salvaged wood to receive a clear finish.
 - 3. Finish system: See Specification Section 09 91 00 for AWI System #TR-4, Conversion Varnish with clear natural finish. Class A Flame Spread, Class 1 Finish Fire Rating.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.
- C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 60 inches long, except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.

1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
 2. Install wall railings on indicated metal brackets securely fastened to wall framing.
 3. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.
- G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 2. Maintain veneer sequence matching of cabinets with transparent finish.
 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with [No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips] [No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish] [toggle bolts through metal backing or metal framing behind wall finish].
- H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 3. Secure backsplashes [to tops with concealed metal brackets at 16 inches o.c.] [and] [to walls with adhesive].
 4. Calk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."
- I. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
- J. Refer to Division 9 Sections for final finishing of installed architectural woodwork not indicated to be shop finished.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06 40 23

SECTION 07 13 26 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes self-adhering modified bituminous sheet waterproofing.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. LEED Submittals:
 - 1. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
- C. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.7 WARRANTY

- A. **Manufacturer's Warranty:** Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
1. **Warranty Period:** Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. **Representative Product:** Grace, W. R., & Co. - Conn.; Bituthene 4000.
- B. **Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated on one side to a 4-mil- (0.10-mm-) thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.**
1. **Equal Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Hydrotech, Inc.; VM75.
 - b. Carlisle Coatings & Waterproofing Inc.; CCW MiraDRI 860/861.
 - c. CETCO Building Materials Group, a subsidiary of AMCOL International Corp.; Envirosheet.
 - d. Henry Company; Blueskin WP 100/200.
 - e. Meadows, W. R., Inc.; SealTight Mel-Rol.
 - f. Nervastral, Inc.; BITU-MEM.
 - g. Polyguard Products, Inc.; Polyguard 650.
 - h. Protecto Wrap Company; PW 100/60.
 - i. Tamko Building Products, Inc.; TW-60.
 - j. York Manufacturing, Inc.; HydroGard.
 2. **Physical Properties:**
 - a. **Tensile Strength, Membrane:** 250 psi (1.7 MPa) minimum; ASTM D 412, Die C, modified.
 - b. **Ultimate Elongation:** 300 percent minimum; ASTM D 412, Die C, modified.
 - c. **Low-Temperature Flexibility:** Pass at minus 20 deg F (minus 29 deg C); ASTM D 1970.
 - d. **Crack Cycling:** Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C 836.
 - e. **Puncture Resistance:** 40 lbf (180 N) minimum; ASTM E 154.
 - f. **Water Absorption:** 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
 - g. **Water Vapor Permeance:** 0.05 perms (2.9 ng/Pa x s x sq. m) maximum; ASTM E 96/E 96M, Water Method.
 - h. **Hydrostatic-Head Resistance:** 200 feet (60 m) minimum; ASTM D 5385.

3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.
- C. Modified Bituminous Sheet, Fabric Reinforced: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of rubberized-asphalt membrane with embedded fabric reinforcement, and with release liner on adhesive side.
1. Physical Properties:
 - a. Pliability: No cracks when bent 180 degrees over a 1-inch (25-mm) mandrel at minus 25 deg F (minus 32 deg C); ASTM D 146.
 - b. Puncture Resistance: [40 lbf (180 N)] [100 lbf (445 N)] minimum; ASTM E 154.
 - c. Water Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m) maximum; ASTM E 96/E 96M, Water Method.
 2. Sheet Strips: Self-adhering, reinforced, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.2 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid primer recommended for substrate by sheet-waterproofing material manufacturer.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (229-mm) centers.
- G. Protection Course: Extruded-polystyrene board insulation, unfaced, ASTM C 578, Type X, 1/2 inch (13 mm) thick.

2.3 MOLDED-SHEET DRAINAGE PANELS

- A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 (0.21-mm) sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate of 9 to 15 gpm per ft. (112 to 188 L/min. per m).

1. Representative product: Subject to compliance with requirements, provide Hydroduct 220 or Hydroduct 660 by Grace, W. R., & Co. – Conn.
2. Or an equal product by one of the following manufacturers:
 - a. American Hydrotech, Inc.; Hydrodrain 400 or Hydrodrain 420.
 - b. Carlisle Coatings & Waterproofing Inc.; CCW MiraDRAIN 6000, CCW MiraDRAIN 6000XL, CCW MiraDRAIN 6200 or CCW MiraDRAIN 6200XL.
 - c. Protecto Wrap Company; Protecto Drain 2000-V.

2.4 PROTECTION BOARD

- A. Extruded Polystyrene Protection Board: 1" Thick.

PART 3 - EXECUTION

3.1 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Prepare surfaces and install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
 1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).
- D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.
- E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- F. Seal edges of sheet-waterproofing terminations with mastic.
- G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- H. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.
- I. Immediately install protection course with butted joints over waterproofing membrane.

1. Molded-sheet drainage panels may be used in place of a separate protection course to vertical applications when approved by waterproofing manufacturer and installed immediately.

3.2 MOLDED-SHEET DRAINAGE-PANEL INSTALLATION

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesives or other methods that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
 1. For vertical applications, install protection course before installing drainage panels.

3.3 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 13 26

SECTION 07 21 00 - INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Foam-plastic board insulation.
 - 2. Glass Fiber Blanket Insulation.
 - 3. Mineral-wool blanket acoustic insulation.
 - 4. Spray polyurethane foam insulation.
 - 5. Vapor barriers.

- B. Related Sections:
 - 1. Section 04 20 00 "Unit Masonry" for insulation installed in cavity walls.
 - 2. Section 07 52 10 Hot Applied Built-Up Hybrid Roofing for insulation specified as part of roofing construction.
 - 3. Section 078446 "Fire-Resistive Joint Systems" for insulation installed as part of a perimeter fire-resistive joint system.

1.3 ACTION SUBMITTALS

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

- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.

1.4 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and minimum compressive strength indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company (The).
 - c. Owens Corning.
 - d. Pactiv Building Products.
 - 2. Type IV, 25 psi (173 kPa).
 - 3. Representative Product: STYROFOAM™ Brand CAVITYMATE™ SC Insulation
 - a. 2.5" Thick; R 12.5 (aged R Value); 4 x 8 Sheet; Shiplap Edges; 16 psi compressive strength.
 - b. 16" wide Cavitymate boards at brick and block for truss type thru-wall masonry anchors.
- B. Geotextile-Faced Wall Insulation Drainage Panels: Extruded-polystyrene board insulation complying with ASTM C 578, [Type IV, 25-psi (173-kPa)] [or] [Type VI, 40-psi (276-kPa)] minimum compressive strength; fabricated with tongue-and-groove edges and with one side having grooved drainage channels faced with nonwoven geotextile filter fabric.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Owens Corning.

- C. Foil-Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I, [Class 1] [or] [Class 2], with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
1. Manufacturers: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. Atlas Roofing Corporation.
 - b. Dow Chemical Company (The).
 - c. Rmax, Inc.
 2. Representative Product: DOW THERMAX™ RIGID Insulation
 - a. 2.0" Thick; R 13 (6.5 per inch aged R value); 4 x 8 Sheet; Shiplap Edges.
- D. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

2.2 MINERAL-WOOL BLANKET INSULATION (For Exterior Stud Walls and Interior Acoustic)

- A. Manufacturers: Acceptable Material: ROXUL INC., ROXUL COMFORTBATT™. Subject to compliance with requirements, provide products by one of the following:
1. Fibrex Insulations Inc.
 2. Owens Corning.
 3. Thermafiber.
- B. Description: Unfaced, Mineral-Wool Blanket Insulation: Non-combustible, lightweight, semi-rigid stone wool batt insulation to ASTM C665, Type 1.
1. R value/1 inch at 75 °F: 0.125 h ft² °F/Btu.
 2. Batt Insulation for exterior stud walls: To ASTM C665, Type 1.
 3. 1. Fire performance:
 4. a. Non-combustibility: To ASTM E136.
 5. b. Surface Burning Characteristics: To ASTM E84.
 6. 1) Flame spread: 0.
 7. 2) Smoke developed: 0.
 8. Thermal resistance: To ASTM C518.
 9. Density: 2 lbs/ft³ to ASTM C167.
 10. Size: 16 x 48 inches.
 11. Thickness: 3.5" (R15).

2.3 SPRAY POLYURETHANE FOAM INSULATION

- A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84 for insulating around penetrations in exterior walls.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Corporation.
 - b. BaySystems NorthAmerica, LLC.
 - c. Dow Chemical Company (The).
 - d. ERSystems, Inc.
 - e. Gaco Western Inc.
 - f. Henry Company.
 - g. NCFI; Division of Barnhardt Mfg. Co.
 - h. SWD Urethane Company.
 - i. Volatile Free, Inc.
 2. Minimum density of 1.5 lb/cu. ft. (24 kg/cu. m), thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F (43 K x m/W at 24 deg C).
 3. Min. thickness: 3" (R 6 per inch).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF BELOW-GRADE INSULATION

- A. On vertical surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
 - 1. If not otherwise indicated, extend insulation a minimum of 36 inches below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
 - 1. If not otherwise indicated, extend insulation a minimum of 24 inches in from exterior walls.

3.4 INSTALLATION OF CAVITY-WALL INSULATION

- A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.
 - 1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042000 "Unit Masonry."

3.5 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Foam-Plastic Board Insulation: Seal joints between units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

- D. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.
- E. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
 - 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.6 INSTALLATION OF INSULATION IN CEILINGS FOR SOUND ATTENUATION

- A. Where insulation blankets are indicated for sound attenuation above ceilings, install blanket insulation over entire ceiling area in thicknesses indicated.

3.7 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 22 00 - ROOF AND DECK INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and contract documents, including *Section 01010 SUMMARY OF WORK*, apply to this section.

1.02 SECTION INCLUDES

- A. Wood fiberboard and polyisocyanurate roof board types and applications. Roof section application and layout requirements.

1.03 RELATED SECTIONS

- A. Section 01 01 00 Summary of Work
- B. Section 01 77 00 Contract Closeout
- C. Section 05 50 00 Metal Fabrication
- D. Section 06 06 00 Rough Carpentry
- E. Section 07 52 15 Hot Applied Built-Up Roofing
- F. Section 07 62 00 Sheet Metal Flashing and Trim
- G. Division 23&26 Mechanical/Electrical Requirements
- H.

1.04 REFERENCES

- A. ASTM C 208 Cellulose Fiber Insulating Board
- B. ASTM C 1289 Polyisocyanurate Insulating Board
- C. UL Roofing and Materials Directory 2003, Underwriters Laboratories Inc.
- D. Factory Mutual Global – Approval Guide
- E. RIC/TIMA Technical Bulletin 281-1 - Roof Insulation Specimen Conditioning Procedure, The Roof Insulation Committee of the Thermal Insulation Manufacturers Association, Mt. Kisco, NY.

1.05 SUBMITTALS

- A. Subcontractor shall provide at Pre-Construction meeting approved insulation samples. Product data sheets shall accompany samples.
 - 1. Polyisocyanurate
 - 2. H.D. fiberboard

3. Manufacturer's tapered insulation plan per roof section

B. LEED Submittals:

1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

F.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery of Materials:

1. Deliver materials to job-site in new, dry, unopened and well-marked containers showing product and manufacturers name.
2. Deliver materials in sufficient quantity to allow continuity of work.
3. Coordinate delivery with project superintendent.
4. Do not order project materials or start work before receiving written notice to proceed. No work shall commence without signed contracts.

B. Storage of Materials:

1. Store roll goods on ends only. Place materials on pallets. Do not stack pallets.
2. Store materials marked "KEEP FROM FREEZING" in areas where temperatures will remain above 40° F.
3. For insulation, remove plastic packaging shrouds. Cover top and sides of all stored materials with tarpaulin (not polyethylene). Secure tarpaulin.
4. Rooftop storage: Disperse material to avoid concentrated loading.
5. Do not store materials in open or in contact with ground or roof surface.
6. Store all materials on a raised platform covered with secured canvas tarpaulin (not polyethylene), top to bottom. Cover all materials when project is not in progress and maintain the ability at all times to cover the materials when required, such as during an unanticipated rain shower.
7. Subcontractor shall assume full responsibility for the protection and safekeeping of products stored on premises.

C. Material handling:

1. Handle materials to avoid bending, tearing, or other damage during transportation and installation.
2. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in location that will hinder smooth flow of vehicular or pedestrian traffic.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Environmental requirements:

1. Do not work in rain, snow, or in presence of water.
2. Do not work in temperatures below 40° F.
3. Do not install materials marked "KEEP FROM FREEZING" when daily temperatures are scheduled to fall below 40° F.

B. Remove any work exposed to freezing.

1. Advise Owner when volatile materials are to be used near air ventilation intakes so Owner can use some or all of the following methods to minimize disruptions to building occupants and operations:

- a. Divert air intake from work area by attaching scoops or temporary ductwork.
- b. Temporarily shut down or block air intakes.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Comply with quality control, references, specifications, and manufacturer's data. Products containing asbestos are prohibited on this project. Use only asbestos-free products.
- B. Use products with personal protection. User must read container label and material safety data sheets prior to use.

2.02 ACCEPTABLE MANUFACTURERS

- A. Use only approved Polyisocyanurate board. Acceptable manufacturers include:
 1. Hy-Therm AP by Celotex
 2. ENERGY-2 by Johns Manville
 3. ISO95+GL by Firestone
 4. Polyisocyanurate by Hunter Panels
 5. AC Foam-II by Atlas
 6. Approved equal by others.
- B. Use only approved High Density Fiberboard. Acceptable manufacturers include:
 1. Temple Inland Fiber Base HD Insulation
 2. Approved equals by others

2.03 MATERIALS

- A. Polyisocyanurate Board Insulation:
 1. FS HH-I-1972 (1) Class 1, factory-tapered isocyanurate.
 2. Black, glass fiber reinforced, non-asphaltic facer
 3. Dimensions: 4 by 4 feet x minimum 2.5 inches thick.
 4. Provide factory-tapered insulation boards fabricated to with a minimum slope of 1/4 inch per foot.
 5. Provide 3 layers at R value 13 per 2" board. Built up and Tapered R38 roof
- B. Polyisocyanurate Saddle and Cricket Insulation:
 1. FS HH-I-1972 (1) Class 1, tapered isocyanurate.
 2. Black, glass fiber reinforced, non-asphaltic facer
 3. Dimensions: 4 by 4 feet.
 4. Provide factory-tapered insulation boards fabricated to slope of twice (2 times) the roof system slope, with a minimum of 1/2 inch per foot.
- C. Top Insulation Layer:
 1. Two-Sided Asphalt Coated High Density Fiberboard.
 - a. ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board.
 2. Dimensions:
 - a. 4 by 4 feet by 1/2 inch thick.
- D. Tapered Edge Strips:
 1. ASTM C 208, asphalt-coated fiberboard, tapered from 1-5/8 inch to 1/8 inch.
 - a. Dimensions: 12" x 48".

- E. Fibered Cant Strips:
 - 1. ASTM C 208-95, asphalt-coated fiberboard, factory fabricated.
 - 2. Dimensions: 4 by 4 inch cut on bias.

- F. Insulation Roof Board Adhesive:
 - 1. Insulation Adhesive: Type III Hot Asphalt.
 - a. Hot melt asphalt adhesive exceeding ASTM D 312-95a performance requirements.
 - b. Asphalt must have the "no smell" additive.

- G. Fasteners: Fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470.
 - 1. Base Layer of Polyisocyanurate Insulation:
 - a. Mechanical fasteners for securement of insulation, tapered insulation, and cover board panels to decking must be approved by the insulation manufacturer for the system specified.
 - b. The same brand fastener is to be used throughout the Work.
 - c. Number of fasteners and layout must be as recommended by the manufacturer and as per FM Approval Guide for I-90 wind uplift.
 - d. Length of fastener to be determined by the thickness of the decking and any fill, and will vary with the thickness of the insulation; fasteners must be of appropriate length to achieve a minimum of 1 inch penetration.
 - e. Acoustical Deck Locations: Fasteners not to exceed length necessary to remain concealed in acoustical cells of steel deck.

- H. Roof insulation accessories:
 - 1. As recommended by insulation manufacturer for intended use and compatible with membrane roofing.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify conditions as satisfactory to receive work.
- B. Do not begin roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.
- C. Verify that work of other trades penetrating roof deck or requiring men and equipment to traverse roof deck has been approved by Owner, manufacturer, and roofing subcontractor.
- D. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of new roofing system.

3.02 GENERAL WORKMANSHIP

- A. All work performed by subcontractor shall conform to this specification.
- B. The presence and activity of the manufacturer's representative, architect's representative, and/or Owner's representative shall in no way relieve subcontractor of contract responsibilities or duties.
- C. Substrate: Free of foreign particles prior to laying roof insulation.

- D. Wrapper and packaging materials: Not to be included in roofing system.
- E. Insulation: Form continuous insulation joints over decking.
- F. Install insulation boards in courses parallel to roof edges.
- G. Firmly butt each insulation board to surrounding boards. Do not jam or deform boards.
- H. Eliminate open joints and uneven surfaces.
 - 1. Maximum insulation gap: 1/4 inch.
 - 2. Fill insulation board joint gaps larger than 1/4 inch with roof insulation.
 - 3. Maximum elevation variation between boards at joints: 1/8 inch.
- I. Cut and fit insulation boards where roof deck intersects vertical surfaces. Cut board 1/4 inch from vertical surface.
- J. Stagger joints at least 6 inches.
- K. Filler size: 18 inches in length or width, minimum.

3.03 PREPARATION

- A. Protection:
 - 1. Subcontractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage and/or clean marred areas at no extra cost to owner.
 - 2. Provide at site prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by owner.
 - 3. Roofing, flashings, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
 - 4. At start of each work day drains within daily work area shall be plugged. Plugs to be removed at end of each workday or before arrival of inclement weather. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.
 - 5. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.
 - 6. Protect building surfaces at set-up areas with tarpaulin. Secure tarpaulin. Remove dumpster from premises when full and empty at approved dumping or refuse area. Deliver empty dumpster to site for further use. Upon job completion, dumpster shall be removed from premises. Spilled or scattered debris shall be cleaned-up immediately. Removed material to be disposed from roof as it accumulates.
 - 7. At end of each working day, seal removal areas with water stops along edges to prevent water entry.
 - 8. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Subcontractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.
- B. Surface preparation:
 - 1. Sweep clean roof deck.

2. Install pressure treated wood nailers as required to match new insulation height.
3. Install base sheet prior to insulation application.

3.04 INSTALLATION

- A. Mechanically Fastened and Adhered Insulation: Install each layer of insulation and secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
1. Mechanically fasten insulation to deck; fastener spacing as required by roofing material manufacturer to satisfy the Contract Documents.
 2. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof. At conditions where the underside of the metal deck will be exposed to view, limit length of screw exposure under deck to 1/4 to 3/8 inches.
 3. Install subsequent layers of insulation in a solid mopping of hot roofing asphalt.
- B. Cover Boards:
1. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows.
 2. Stagger joints from joints in insulation below a minimum of 6 inches in each direction.
 3. Tape joints if required by roofing system manufacturer.
 4. Apply hot roofing asphalt to underside and immediately bond cover board to substrate.
 5. Fasten as necessary to resist uplift pressure at corners, perimeter, and field of roof.

END OF SECTION 07 22 00

SECTION 07 27 20 FLUID-APPLIED MEMBRANE AIR AND VAPOR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 04 20 00 Unit Masonry Assemblies
- C. Section 04 21 13 Brick And Steel Stud Masonry

1.2

- A. This Section includes the following:
 - 1. Fluid-applied membrane vapor retarding air barrier for installation in cavity walls over exterior face of exterior wall sheathing or exterior face of cmu.

E. PERFORMANCE REQUIREMENTS

- B. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated
- B. Shop Drawings: Show locations and extent of air barrier. Include details for substrate joints and cracks, counter-flashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 1. Include details of interfaces with other materials that form part of air barrier.
- C. Product certificates.
- D. Qualification data.
- E. Product test reports.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Mockups: Before beginning installation of air barrier, build mockups of exterior wall assembly 150 sq. ft. , incorporating backup wall construction, external cladding, window, door frame and sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.
 - 1. Coordinate construction of mockup to permit inspection by Owner's testing agency of air barrier before external insulation and cladding is installed.
- C. Preinstallation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 FLUID-APPLIED MEMBRANE AIR BARRIER

- A. Fluid-Applied, Vapor-Retarding Membrane Air Barrier: synthetic polymer membrane.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Synthetic Polymer Membrane:
 - 1) Henry Company; Air-Bloc 21 SR .
 - 2) Grace, W. R. & Co.; Perm-A-Barrier Liquid.
 - 3) Rubber Polymer Corporation; Rub-R-Wall Airtight.
 - b. Representative product: Air-Bloc 21 Air / Vapor
 - 1) Liquid Applied Air Barrier and Dampproofing on CMU : Air-Bloc 21 Air / Vapor Barrier and Adhesive as manufactured by Henry Company/Bakor, Kimberton, PA Tel: 610-933-8888. One coat Trowel or Spray Applied. Adhesive property allows attachment of rigid insulation to the cmu and/or gypsum sheathing backup.
 - 3. Physical and Performance Properties:
 - a. Membrane Air Permeance: Not to exceed 0.004 cfm x sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
 - b. Membrane Vapor Permeance: Not to exceed 0.1 perm; ASTM E 96.

2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by air barrier manufacturer for intended use and compatible with air barrier membrane. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.

- B. Primer: Liquid primer recommended for substrate by manufacturer of air barrier material.
- C. Joint Reinforcing Strip: Air barrier manufacturer's glass-fiber-mesh tape.
- D. Substrate Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- E. Sprayed Polyurethane Foam Sealant: 1- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft (24 to 32 kg/cu. m) density; flame spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
- F. Adhesive-Coated Transition Strip: Vapor-permeable, 17-mil- (0.43-mm-) thick, self-adhering strip consisting of an adhesive coating over a permeable laminate with a permeance of 37 perms (2145 ng/Pa x s x sq. m).
- G. Elastomeric Flashing Sheet: ASTM D 2000, 2BC415 to 3BC620, minimum 50- to 65-mil- (1.3- to 1.6-mm-) thick, cured sheet neoprene with manufacturer's recommended contact adhesives and lap sealant.
- H. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Division 7 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 JOINT TREATMENT

- A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air barrier manufacturer's written instructions.
- B. Gypsum Sheathing: Fill joints greater than 1/4 inch (6 mm) with sealant according to ASTM C 1193 and with air barrier manufacturer's written instructions. Apply first layer of fluid air barrier membrane at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of fluid air barrier membrane over joint reinforcing strip.

3.2 TRANSITION STRIP INSTALLATION

- A. Install strips, transition strips, and auxiliary materials according to air barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
- B. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
 - 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- C. Connect and seal exterior wall air barrier membrane continuously to roofing membrane air barrier, concrete below-grade structures, floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door

framing, and other construction used in exterior wall openings, using accessory materials as indicated.

- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- E. Apply joint sealants forming part of air barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Wall Openings: Flash concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply self adhered membrane flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over both substrates. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air barrier membrane with foam sealant.
- H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.

3.3 AIR AND VAPOR BARRIER MEMBRANE INSTALLATION

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
- B. Apply air barrier membrane to form a seal with strips and transition strips and to achieve a continuous air barrier according to air barrier manufacturer's written instructions.
- C. Apply air barrier membrane within manufacturer's recommended application temperature ranges.
- D. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
 - 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- E. Apply a continuous unbroken air barrier to substrates according to the following minimum thickness. Apply membrane in full contact around protrusions such as masonry ties.
 - 1. Vapor-Retarding Membrane Air Barrier: 60-mil dry film thickness.

- F. Apply strip and transition strip a minimum of 1 inch onto cured air membrane or strip and transition strip over cured air membrane overlapping 3 inches (75 mm) onto each surface according to air barrier manufacturer's written instructions.
- G. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- H. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.
- I. Application over Substrates:
 - a. Over cmu: Install on all faces of the cmu backup on the inside surface of cavity wall construction. Apply additional Air-Bloc 21 material around masonry anchors where they penetrate the cmu.
 - b. Over gypsum sheathing: Install on all faces of the gypsum sheathing on the inside surface of cavity wall construction. Apply additional Air-Bloc 21 material around masonry anchors where they penetrate the gypsum sheathing.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements.
- C. Remove and replace deficient air barrier components and retest as specified above.

3.5 PROTECTION

- A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed for more than 60 days.

END OF SECTION 07 27 20

SECTION 07 33 63 – VEGETATED ROOF ASSEMBLY: PRE-VEGETATED MODULAR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Additional requirements may be specified in other sections.

1.2 SUMMARY

A. Section Includes:

- 1. Pre-vegetated modular vegetated roof assembly components.
- 2. Vegetated roof growing media.
- 3. Vegetated roof planting material.
- 4. Vegetation-free zone material.

B. Related Sections:

- 1. Division 01 Section "Sustainable Design Requirements" for additional LEED requirements.
- 2. Section 03 41 00 "Precast Structural Concrete."
- 3. Division 07 Section "Hybrid Hot Built Up Roofing" for membrane roofing, roof insulation, and total roofing system warranty including warranty coverage for work of this Section.
- 4. Section 07 27 11 "Air Barriers – Performance."
- 5. Section 07 72 73 "Membrane Leak Detection System."
- 6. Section 11 24 29 "Facility Fall Protection" for fall protection devices at roof openings and perimeter.
- 7. Section 22 00 00 "Plumbing."
- 8. Section 32 84 15 "Planting Irrigation for Vegetated Roofs."

1.3 DEFINITIONS

- A. Vegetated Roof Assembly: Rooftop assembly, to form continuous cover over designed roofing area, composed of single-media system, that is designed to grow plants and to retain and retard rainwater runoff from the roof.

- 1. Pre-vegetated Modular Vegetated Roof Assembly: Landscape built using an assembly that is modular, consisting of the following fully integrated living and manufactured components:
 - a. Electronic leak detection.
 - b. Root barrier.
 - c. Technical seam tapes.
 - d. Protection sheet.
 - e. Horizontal insulation.
 - f. Drain inspection box.
 - g. Pre-vegetated modular tray.
 - h. Edging restraint.
 - i. Loose aggregate.
 - j. Erosion control netting.

- k. Irrigation.
 - B. Captured Water: Water that is retained in the drainage layer of a vegetated roof assembly after new water additions have ceased and that cannot escape the roof except through evaporation or plant transpiration.
 - C. Planted Area; Vegetated Area: Areas to be planted.
 - D. Vegetation-Free Zone: Areas without plantings.
 - E. Plant; Plants; Plant Material: Vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
 - F. Alive: Displaying horticultural viability consisting of vigorous, hardy, and sustainable growth characteristics.
 - G. Retained Water: Water that is held for a period of hours or days but would eventually drain out given enough time in the absence of evaporation or plant transpiration.
- 1.4 ACTION SUBMITTALS
- A. Submittals in accordance with Section 01 33 00 "Submittal Procedures".
 - B. Coordinate submittal requirements and provide submittals required by Section 01 47 15 "Sustainable Requirements: Construction".
 - C. Product Data: For each of the components of vegetated roof assembly indicated, including the following:
 - 1. Root barrier and barrier seam tape.
 - 2. Protection sheet.
 - 3. Horizontal insulation.
 - 4. Drain inspection box.
 - 5. Pre-vegetated modular tray.
 - 6. Edging restraint.
 - 7. Loose aggregate.
 - 8. Erosion control netting.
 - 9. Irrigation.
 - D. US Occupational Health and Safety Administration's (OHSA) Hazard Communications Standard (HCS): Safety Data Sheets (SDS): For each of the following components of vegetated roof assembly:
 - 1. Root barrier.
 - 2. Protection sheet.
 - 3. Modular tray.
 - 4. Edging restraint.
 - 5. Drain inspection box.
 - 6. Erosion control netting.
 - 7. Technical seam tapes.
 - E. LEED Submittals:

1. Product Test Reports for Credit SS 7.2: For paver and aggregate surfacing materials, indicating that materials comply with Solar Reflectance Index requirement.
 2. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.
- F. Shop Drawings: For vegetated roof assemblies. Include roof plans, slopes, and drain locations; details of vegetated roof assemblies and accessories, and aggregate surfacing.
1. Indicate planted areas correlated with planting schedule.
 2. Coordinate with requirements for membrane leak detection system.
- G. Samples for Verification: Two (2) samples for each of the following components of vegetated roof assembly:
1. Pre-vegetated modular tray: 12 inch x 24 inch.
 2. Growing media: 1-quart volume of each growing media, in sealed plastic bags labeled with content and source. Each Sample shall be typical of the lots of growing media to be furnished. Provide an accurate representation of texture and composition.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Installer's Certificate: For vegetated roof assembly Installer and irrigation system Installer, verifying qualifications on company letterhead.
- B. Manufacturer's Certificate: For specified products of vegetated roof assembly, signed by Manufacturer, verifying approval of Installer.
- C. Product Testing Data: Based on evaluation of comprehensive tests conducted on specified products by the following independent testing agencies:
1. Test reports from a certified laboratory for ASTM E 2399-05: For growing media, tested within current twelve (12) month period.
- D. Manufacturer Field Inspection Reports: Manufacturer's written reports and acceptance of vegetated roof assembly Installer based on regular inspections. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.
- E. Warranty: Sample of special warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: Recommended maintenance plan including procedures for inspection and care of vegetated roof assembly and plants during a calendar year. Submit before start of required warranty and maintenance periods.
- B. Maintenance Reports: Reports of vegetated roof assembly Inspector submitted quarterly. Must be signed by approved representation of vegetated roof assembly Installer, must outline actions carried out as per Maintenance Requirements.
- 1.7 QUALITY ASSURANCE
- A. Vegetated Roof Assembly Installer Qualifications: A qualified Installer, certified by vegetated roof assembly Manufacturer, whose work has resulted in successful establishment of plants.
1. Experience: Three years' proven experience in vegetated roof assembly installation in addition to requirements in Section 01 40 00 "Quality Requirements."

2. Training: Staff trained to facilitate maintenance of vegetated roof assembly.
 3. Fall Protection: Fall Arrest Certificates maintained by all employees of Installer when working on roof top.
 4. Installer's Field Supervision: Maintain experienced full-time supervisor on Project site when work is in progress.
- B. Vegetated Roof Assembly Manufacturer Qualifications: A qualified company, specialized in supplying vegetated roof assembly systems.
1. Experience: Five years' experience in supplying vegetated roof assemblies.
- C. Source Limitations: Obtain vegetated roof assembly components and roof membrane specified in Division 07 roofing membrane section from single source from single manufacturer.
- D. Electronic Testing: Perform leak testing by installation of Electro Field Vector Mapping (EFVM) system administered by a qualified testing agency. Flood testing is unacceptable as a testing procedure.
- E. Health and safety: Perform in accordance to Health and Safety Requirements.
- F. Pre-Installation Conference: Conduct conference at Project site one week prior to beginning work of this Section in accordance with Section 01 32 16.06 "Construction Progress Schedule – Critical Path Method (CPM)".
1. Coordinate: Requirements and procedures related to roof deck and roofing system construction:
 - a. Participants: authorized representatives of Contractor, Construction Manager, Owner, Consultant, Roofing Subcontractor, Roofing Manufacturer, vegetated roof assembly Manufacturer, vegetated roof assembly Installer.
 - b. Vegetated Roof Assembly: Review methods and procedures, including Manufacturer's written installation instructions.
 - c. Construction Schedule: Review and confirm availability of products, Subcontractor personnel, equipment, and facilities.
 - d. Conformance: Review roofing membrane type and vegetated roof assembly criteria.
 - e. Structural Load: Review limitations of roof deck, identifying loading areas for storage. Obtain structural report from Consultant certifying dead load weight restrictions for entire assembly.
 - f. Roof Details: Review flashing, drains, penetrations, equipment curbs, and other conditions.
 - g. Regulations: Review, including necessary insurance and/or certificates.
 - h. Safety: Review requirements, including Fall Protection requirements.
 - i. Quality Control: Review procedures and policy.
 - j. EFVM: Obtain report certifying roof is watertight.
 - k. Coordinate: related work specified in other Sections.
 - l. Inspection: Review Manufacturer's procedure for warranty.
 - m. On-site traffic: Review limits by other trades on vegetated roof assembly and procedures for compensation due to damage.
 - n. Meeting minutes: Taken by representative of Consultant and distributed to all parties within 24 hours of meeting date.
 - o. Photographic records: Taken by Contractor prior to commencement of Work.

1.8 PROJECT FIELD CONDITIONS

- A. Product Handling: Deliver and store products in original packaging with Manufacturer's labels and materials list intact and signed off, elevated from ground and protected from environmental

damage within designated weather protected areas. Avoid storage of products on site to prevent contamination.

- B. Pre-vegetated Modular Tray Handling: Install pre-vegetated modules immediately upon delivery to site.
- C. Installation:
 - 1. Pre-vegetated Modular Tray: According to optimal conditions, conducive to plant establishment and survival based upon local hardiness zone as defined by USDA.
 - 2. All other components of vegetated roof assembly: At any time, adequate protection should be provided to prevent damage and erosion.
- D. Foot Traffic: Prohibited on vegetated roof assembly during vegetation establishment period and thereafter except for vegetated roof maintenance purposes.

1.9 WARRANTIES

- A. Roof System Warranty, General: Warranties specified in this Section are components of the roofing system warranty specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:
 - 1. Refer to Division 07 roofing membrane section for roofing system warranty and continuing maintenance service requirements, including warranty requirements of other specification sections referenced in roofing system warranty.
- B. Special Warranty for Vegetated Roof Assembly: Provide manufacturer's standard warranty in which Manufacturer and Installer jointly agree to repair or replace vegetated roof assembly and components, including root barrier, membrane protection sheet, percolation/retention and drainage layer, geotextile filter fabric layers, horizontal insulation, and engineered growing media, and excluding plant materials covered under separate warranty below, that fail in materials or workmanship within specified warranty period.
 - 1. Failure includes, but is not limited to, ponding water or prolonged wetness of growing media caused as a result of failure of the assembly to properly drain.
 - 2. Manufacturer's warranty applies to Projects installed by Manufacturer-approved Installer and inspected by Manufacturer Technical Representative.
 - 3. Warranty Period: 25 years from date of Substantial Completion.
- C. Special Warranty for Plant Growth: Provide manufacturer's standard warranty in which Manufacturer and Installer jointly agree to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Groundcover Foliage Cover: Plantings shall grow to achieve and maintain at least 85 percent foliage cover over planting area, when averaged within 2 square foot increments, commencing with installation, at the end of the warranty period. Provide extended warranty for remainder of original warranty period for replaced plant material.
 - 2. Failures include, but are not limited to, death and unsatisfactory growth of plant materials except for defects resulting from abuse, neglect by Owner, or incidents that are beyond Contractor's control.
 - 3. Warranty Periods from Date of Installation:
 - a. Ground Covers: Two years.

1.10 MAINTENANCE SERVICE

- A. Initial Maintenance Service for Plant Materials: Provide maintenance and general housekeeping of vegetated roof assembly by competent employees of vegetated roof assembly Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and

continue until plantings are acceptably healthy and well established but for not less than the following maintenance period:

1. Site Visits: Provide not less than three site visits per year to perform required tasks under this Service. Provide one site visit during Year Two by a qualified Manufacturer's representative.
 2. Growing Media Testing and Amending: Perform testing during second year of initial maintenance period and apply amendments to growing media as required. Comply with local watershed authority stormwater nutrient run-off restrictions.
 3. Include the following remedial actions as a minimum:
 - a. During inspection, remove dead plants and replace unless required to plant in the succeeding planting season.
 - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period. Trim plants and remove weeds. Provide supplemental water if required at time of inspection and service.
 - c. Reports: Provide written report to Owner including health assessment of plant material and growing media and indication of work performed with each site visit.
 4. Initial Maintenance Period: Equal to warranty period under "Special Warranty for Plant Growth" Paragraph above.
- B. Continuing Maintenance Service: Provide maintenance and general housekeeping of vegetated roof assembly by competent employees of vegetated roof assembly Installer. Manufacturer's standard continuing maintenance agreement, commencing on date initial maintenance service under warranty is concluded. Include the following:
1. Site Visits: Provide not less than three site visits per year to perform required tasks under this Service.
 2. Growing Media Testing and Amending: Perform testing annually and apply amendments as required.
 3. Supplemental Water: Add supplemental water as required to bring growing media up to recommended moisture content levels. Inform Owner of recommended adjustment to Owner's watering practices.
 4. Weeding and Plant Material Housekeeping: Remove dead and damaged growth and weeds and debris. Dispose of debris onsite in Owner's container.
 5. General Housekeeping: Perform general rooftop housekeeping in accordance with requirements in Division 07 roofing section.
 6. Reports: Provide report to Owner including health assessment of plant material and growing media, and indication of work performed, with each site visit.
 7. Continuing Maintenance Period: 20 years from date of substantial completion.

PART 2 - PRODUCTS

2.1 SYSTEM SUPPLIER

- A. Supplier of vegetated roof assembly having systems and/or products approved for use:
1. Basis of Design: VR Mod Vegetated Roof Assembly System by Tremco Inc., www.tremcroofing.com
 2. Approved Equal.

2.2 PERFORMANCE REQUIREMENTS

- A. Vegetated Roof Assembly: Provide vegetated roof assembly that will support vegetation, reaching an average coverage of not less than 85 percent coverage of the growing media within 24 months of installation.

- B. **Water Capacity:** Provide vegetated roof assembly with water retention capacity of a minimum of 3.5 gal/cu. ft. (468 L/cu. m) of water for VR Mod Sedum systems. Calculations include the combined water retention capacity of growing media and modular tray. For growing media, the water retention capacity is calculated by using the difference between dry and saturated weight as per ASTM E 2399-05. For the modular tray, the water retention capacity is found when measured in accordance with ASTM E 2398-11.
- C. **Drainage:** Provide vegetated roof assembly with rainfall drainage capacity not less than 15 in./hr. (38 cm/hr). Rainfall drainage capacity based on saturated hydraulic conductivity of growing media in accordance with ASTM E 2399-05.
- D. **Growing Media:** Provide growing media that meets the following characteristics for the VR Mod system specified:
 - 1. VR Mod Sedum:
 - a. Depth: Not less than 4 inches (100 mm) [As indicated on Drawings].
- E. **Vegetation:**
 - 1. Source Location: Locally to project site, within 500 mile (800 km) radius.
 - 2. Verification: Ensure compatibility to growing media by Manufacturer prior to acceptance.

2.3 VEGETATED ROOF ASSEMBLY COMPONENTS

- A. **Sedum Pre-Vegetated Modular Tray:** Modular unit, pre-vegetated with sedum plantings, that includes a permanent water retention and drainage layer, above which is situated an integrated filter fabric barrier and a built-in positive locking mechanism to attach the modules together, consisting of 100% recycled content.
 - 1. Basis of Design Product: Tremco Inc., VR Mod Sedum Pre-Vegetated Modular Tray.
 - 2. Modular Tray:
 - a. Physical Properties:
 - 1) Tray Dimensions: 12 in x 24 in x 5.75 in (381 mm x 508 mm x 146 mm).
 - 3. Hydraulic Properties:
 - a. Water Retention Capacity: 1.1 gal/sq. ft. (45 L/sq. m).
- B. **Protection Sheet:** Polyester membrane protection sheet made from 100% post-consumer recycled fibers.
 - 1. Basis of Design Product: Tremco, Inc., VR PolyMat.
 - 2. Physical Properties:
 - a. Thickness: 60 mil (1.52 mm).
 - b. Weight, ASTM D 3776: Minimum, 4.5 – 5 oz./sq. yd. (160 g/sq. m).
 - 3. Mechanical Properties:
 - a. Elongation, ASTM D 4632 : 50%.
 - b. Grab Tensile Strength, ASTM D 4632 : 100 lbf (444 N).
 - c. Trapezoid Tear, ASTM D 4533 : 45 lbf (200 N).
 - d. Puncture Strength, ASTM D 4833 : 65 lbf (288 N).
 - e. Mullen Burst, ASTM D 3786 : 210 psi (1448 kPa).
 - f. UV Resistance, ASTM D 4355 : 70%.
 - 4. Hydraulic Properties:
 - 5. Water Retention, ASTM F 726-06: 0.05 gal/sq. ft. (2.02 L/sq. m).
- C. **Technical Seam Tape:** Self-adhered, waterproof membrane with acrylic pressure sensitive adhesive.

1. Basis of Design Product: Tremco Inc., VR TecTape 4.
 2. Physical Properties:
 - a. Thickness: 9.9 mil (0.25 mm).
 3. Mechanical Properties:
 - a. Nail Sealability, ASTM E 331/547 (per AAMA 711-07, Annex 1): Pass both before and after thermal cycling.
- D. Drain Inspection Box: Manufacturer's standard drain inspection box formed from aluminum, with lockable lid and perforated at drainage course level.
1. Basis of Design: Tremco Inc, VR DrainGuard 4.
 2. Physical Properties:
 - a. Thickness: 60 mil (1.52 mm).
 - b. Dimensions: 15 in x 15 in (375 mm x 375 mm).
 - c. Height: 6 in (152 mm).
 - d. Perforations, diameter: 3/4 in (19 mm).
- A. Edging Restraint: Manufacturer's standard L-shaped edging with top lip, formed from extruded aluminum. Solid at growing layer to prevent rooting and plant growth through the edging. Perforated at drainage course level to allow for free drainage. Use with Manufacturer's edging restraint connector.
1. Basis of Design: Tremco, Inc., VR EdgeGuard 4.
 2. Physical Properties:
 - a. Thickness: 80 mil (2.03 mm).
 - b. Height: 5.97 in (151.64 mm).
 - c. Flange Length: 4 in (101.60 mm).
 - d. Length: 8 ft (2.5 m).
 - e. Lip: 3/8 in (9.525 mm).
 - f. Perforations, diameter: 3/4 in (19 mm).

2.4 VEGETATED ROOF GROWING MEDIA

- A. Growing Media: Vegetated roof assembly manufacturer's engineered growing media, provided with pre-vegetated modular unit.

2.5 VEGETATED ROOF PLANTING MATERIALS

- A. Planting Materials, General: Provide plant materials of types indicated.
- B. Pre-vegetated Modular Tray Planting Materials:
1. VR Mod Sedum: Sedum species that are healthy, vigorous, well-rooted, consisting of a minimum of 5 varieties.

2.6 VEGETATION-FREE ZONE MATERIALS

- A. Aggregate Ballast: ASTM D 1863, No. 6 or No. 67, clean, dry, opaque, water-worn gravel, free of sharp edges.
1. Size: ASTM D 448, Size 4, 3/4 to 1-1/2 inches (19 to 38 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and report any adverse conditions which may negatively impact appearance or performance of vegetated roof system. Ensure all unacceptable conditions are corrected before proceeding.
 - 1. Verify that roof insulation over membrane roofing is in place, secure, and flush along all seams.
 - 2. Verify that perimeter and other flashings are in place and secure along entire lengths where they will be covered by vegetated roof assembly.
- B. Ensure adequate provisions have been made for loading, unloading, storage, parking and access to roof site.
- C. Execute work in accordance with the specification, drawings and details.
- D. Report any imbedded object or obvious damage to Consultant.
- E. Ensure all equipment is in good working order. Protect all equipment which comes into contact with roofing membrane, flashings and related work.
- F. Ensure adequate safety equipment has been obtained for all operations.
- G. Test roof membrane in accordance with procedures of manufacturer of system specified in Section 07 72 73 "Membrane Leak Detection System."
- H. Proceed with installation of vegetated roof assembly only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Protect structures, utilities, sidewalks, pavements, and other facilities and areas from damage caused by installation.
- B. Protect roofing according to Manufacturer written recommendations to prevent damage and wear during examination, testing, installation, and remainder of construction period.

3.3 VEGETATED ROOF ASSEMBLY INSTALLATION

- A. Installation, General: Install vegetated roof assembly components according to Manufacturer's written instructions and approved shop drawings.
- B. Protection Sheet:
 - 1. Install protection sheet where indicated, in continuous installation over root barrier.
 - 2. Overlap all side and end laps a minimum of 4 inches (100 mm) and seal with Manufacturer's technical tape.
 - 3. Extend fabric 1-inch (25 mm) above ballast at perimeter and penetrations. Do not cover drains or restrict water flow to drains.
- C. Drain Inspection Box:

1. Install inspection box centered over drains directly on the insulation board/protection sheet. Ensure the bottom inner edge of the inspection box is outside of the outer edge of the drain flange.
2. Install filter fabric over vertical drains and over lip of inspection box.
3. Cut slits in fabric to fit around locking pins and adhere to top inside edge with Manufacturer's technical tape.

D. Pre-Vegetated Modular Trays:

1. Install modular trays on roof surface, working top to bottom and left to right while locking modules together.
2. Insert lateral lines of irrigation system into quick-fit couplers on outside edge of pre-plumbed modular trays as per irrigation drawings.
3. Run lateral irrigation lines as per plans and drawings and connect to sprinkler head fittings accessible on underside of pre-plumbed modular tray. Ensure irrigation piping is laid in the void space along the edge of the pre-vegetated modular tray prior to connecting the next pre-vegetated modular tray.
4. Ensure side walls of modules on outside perimeter of vegetated areas are clean and dry.
5. Seal side walls on outside perimeter of vegetated areas with Manufacturer's 4-inch technical tape.
6. At cut modules, use a concrete saw with a new diamond blade. Mark the modular and cut from top to bottom until excess is fully separated.
7. Seal cut side of module with Manufacturer's 4-inch technical tape.
8. Turn the cut site of the module in to meet sidewall of adjacent full-size modules. Ensure a very tight fit.

E. Edging Restraint:

1. Install edging along perimeter border between vegetation-free area and vegetated area, according to Manufacturer's instructions and approved shop drawings.
2. When joining two sections together, ensure a tight fit at all joints. Remove backing from edge connector and apply to overlap both ends of joints. Press firmly.
3. At corners, cut and bend as required for clean, mitered finish.
4. Ensure base flange is pointed towards the vegetated areas and sits beneath pre-vegetated modules.

3.4 VEGETATION-FREE ZONE INSTALLATION

- A. To roofed area, apply aggregate ballast uniformly over geotextile fabric at rate required by manufacturer, but not less than the following, carefully spreading aggregate to not damage roofing membrane and base flashings. Apply ballast as insulation is installed, leaving roofing membrane insulated and ballasted at end of workday.

1. Ballast: 15 lb/sq. ft. (75 kg/sq. m), aggregate within 12 inches (2600 mm) of roof perimeter and corners and 12 inches (600 mm) of roof penetrations; 10 lb/sq. ft. (50 kg/sq. m) aggregate elsewhere.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage membrane roofing and vegetated roof assembly Manufacturer's authorized technical service representative to provide full-time inspection of vegetated roof assembly installation and prepare interim and final inspection reports.

- B. Correct identified deficiencies or irregularities in work that do not comply with requirements.

3.6 PLANT MAINTENANCE

- A. General: During maintenance period prior to substantial completion, and during warranty period, maintain plantings by pruning, cultivating, supplemental watering if required, weeding, fertilizing if required, removal of debris from drainage areas, adjusting and repairing devices, resetting plants to proper elevations or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Replace growing media that becomes displaced or eroded because of settling or other processes.
- C. Maintain integrated pest management program to keep plant materials, planted areas, and growing media free of pests and pathogens or disease following recommendations of USEPA as appropriate to minimize the use of pesticides and reduce hazards.
- D. Use only products and methods acceptable to membrane roofing Manufacturer.

3.7 CLEANING AND PROTECTION

- A. During planting and maintenance, keep adjacent areas and construction clean and maintain work area in an orderly condition.
- B. Protect vegetated roof assemblies from damage due to planting operations and operations of other contractors and trades. Repair or replace damaged vegetated roof assemblies.

END OF SECTION 32 95 00

SECTION 07 42 30 - METAL COMPOSITE MATERIAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes metal composite material wall panels.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project Site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.1: For sealants used inside the system, documentation including printed statement of VOC content.
 - 2. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
 - a. Aluminum extrusions that contain at least 60% post-industrial recycled content
 - 3. Regional Materials MR Credit 5.1: Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- C. Shop Drawings: Include fabrication and installation layouts of metal composite material panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.
- D. Samples: For each type of metal composite material panel indicated.

1.5 INFORMATIONAL SUBMITTALS

- A. Product test reports.

- B. Warranties: Samples of special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal composite material panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal composite material panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal composite material panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 330:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Deflection Limits: For wind loads, no greater than 1/180.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint

sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient.

E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 METAL COMPOSITE MATERIAL WALL PANELS

A. Metal Composite Material Wall Panel Systems: Provide factory-formed and -assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment assemblies components, panel stiffeners, and accessories required for weathertight system.

1. Basis-of-Design Product: Subject to compliance with requirements, provide
a. Alucobond PE

Manufacturer: By 3A Composites USA, Inc..Local Area Rep: Stephen Siciliano,
Madison NJ. Office: (973) 377-4910. Mobile: (908) 406-0538.

2. Comparable products by one of the following:

- a. Alcoa Inc.; Reynobond FR.
- b. Fairview Architectural, Vitrabond
- c. CENTRIA Architectural Systems; Formabond Wall System.
- d. Citadel Architectural Products, Inc.; Envelope 2000 RR.
- e. Firestone Metal Products, LLC; UNA-FAB Series 1000.
- f. Protean Construction Products, Inc.; ACM 100.

3. Metal Panel Fabricators:

- a. Mid Atlantic Construction
8520 co Place, Upper Marlboro, MD 20772
Tel: 301.322.7200
- b. Bamco
30 Baekeland Ave, Middlesex, NJ 08846
(732) 302-0889

B. Aluminum-Faced Composite Wall Panels: Formed with 0.020-inch- (0.50-mm-) thick, aluminum sheet facings.

- 1. Panel Thickness: 0.157 inch (4 mm).
- 2. Core: Standard.

C. Attachment Assembly Components: Formed from extruded aluminum.

D. Attachment Assembly: Manufacturer's standard.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal composite material panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal composite material panels unless otherwise indicated.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal composite material panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal composite material panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal composite material panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: ASTM C 920; as recommended in writing by metal composite material panel manufacturer. Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

2.4 FABRICATION

- A. General: Fabricate and finish metal composite material panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Fabricate metal composite material panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

2.5 FINISHES

- A. Panels and Accessories:
 - 1. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Colors: Two (2) colors

- a. "Silver Metallic" PVDF-3 (Polyvinylidene Fluoride Finish) /Gloss 30/SRI 58. by Alucobond
- b. Match the above sample.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal composite material panel manufacturer's written recommendations.

3.2 METAL COMPOSITE MATERIAL PANEL INSTALLATION

- A. Attachment Assembly, General: Install attachment assembly required to support metal composite material wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.
 1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
- B. Installation: Attach metal composite material wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.
 1. Wet Seal Systems: Seal horizontal and vertical joints between adjacent metal composite material wall panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."
 2. composite material
 3. Rainscreen Systems: Do not apply sealants to joints unless otherwise indicated.
- C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

3.3 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal composite material panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal composite material panel installation, clean finished surfaces as recommended by metal composite material panel manufacturer. Maintain in a clean condition during construction.

END OF SECTION 07 42 30

SECTION 07 46 00 EXTERIOR ALUMINUM SOFFITS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum Soffits at Entrance Canopy.

1.2 RELATED SECTIONS

- A. Section 05 40 00 - Cold-Formed Metal Framing: Metal framing for support of aluminum soffits.
- B. Section 06 10 00 - Rough Carpentry: Wood stud framing, furring, and sheathing for support of aluminum soffits.
- C. Section 07 21 00 - Building Insulation: Rigid thermal insulation installed behind siding.
- D. Section 07 60 00 - Flashing and Sheet Metal: Sheet metal gutters and downspouts.
- E. Section 07 90 00 - Joint Sealers: Sealants used in conjunction with aluminum siding installation.

1.3 REFERENCES

- A. ASTM D 958 - Practice for Determining Temperatures of Standard ASTM Molds for Test Specimens of Plastics.
- B. AAMA 2605-05 - Voluntary Specification, Performance requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- C. AAMA 2604 - Voluntary Specification, Performance requirements and Test Procedures for High Performing Organic Coatings on Aluminum Extrusions and Panels.
- D. AAMA 2603 - Voluntary Specification, Performance requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- E. ASTM E2768-11 –Standard Test Method for Extended Duration Surface Burning Characteristics for Building Materials (30 min Tunnel Test). Results: Zero Flame Spread, Smoke Developed Index of 5. Meets criteria for Class A fire rating.
- F. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
- G. CAN/ULC S114 – Standard method of test for determination of non-combustibility in building materials.

1.4 PERFORMANCE REQUIREMENTS

- A. Components: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with applicable code.
- B. Movement: Accommodate movement within system without damage to components or movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing.
- C. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- 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: Indicate dimensions, layout, joints, expansion joints, construction details, methods of anchorage, and interface with adjacent materials.
- D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
 - 1. EAc1 Energy & Atmosphere: Provide documentation on how the aluminum siding back framing system can reduce the design energy consumption and/or cost. (LEED Form).
 - 2. MRc2 Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill. (LEED Form).
 - 3. MRc5 Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material. (LEED Form).
 - 4. MRc8 Durable Building: Provide documentation on how the use of aluminum siding/soffit will help increase the building's service life. (LEED Form).
 - 5. EQc4.2 Low Emitting Materials - Provide documentation on how the powder coating on the aluminum siding/soffit indoors has no VOC's and will not contribute to air pollution/ozone depletion. (VOC Certification Letter).
 - 6. EQc7.1 Thermal Comfort: Provide documentation on how the aluminum siding backframing system, which allows for external insulation, helps the building to maintain an indoor level of comfort at greater energy efficiency. (LEED Form).
 - 7. IDc1.1 Innovation in Design: Provide documentation on how the use of aluminum siding/soffit with a powder coated finish supports innovation in design. (LEED Form).
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, two samples, minimum size 2 inches (51 mm) by 3-1/2 inches (89 mm), representing actual product, color, and gloss.

- G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of components.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum five years experience producing aluminum finishes of the types specified and AkzoNobel, AAMA 2605 and 2605 Certified.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and gloss are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Package and store products under cover in manufacturer's unopened packaging until ready for transport and installation.
- B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- C. Store prefinished material off ground protected from weather, to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- D. Prevent contact with materials capable of causing discoloration or staining.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not fabricate products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

- A. Coordinate Work with installation of windows, louvers, and adjacent components or materials.

1.10 WARRANTY

- A. Mayne Coatings Corp. limited warranty against cracking, peeling and gloss/color retention within the guidelines stated by the American Aluminum Manufacturers Association (AAMA).
 - 1. Standard Colors:
 - a. D2000 - AAMA 2604 (5 Year Florida) 15 Year manufacturer's Warranty
 - b. D3000 - AAMA 2605 (10 Year Florida) 20 Year manufacturer's Warranty
 - 2. Woodgrains
 - a. AAMA 2604 (5 Year Florida) 15 Year manufacture's Warranty

PART 2 PRODUCTS

2.1 MATERIAL MANUFACTURERS

- A. ACCEPTABLE MANUFACTURE: Mayne Coatings Corp., which is located at: 27575-50th Ave. ; Langley, BC; Canada V4W 0A2; Tel: 604-607-6630; Fax: 604-607-6680; Email: [request info \(info@longboardproducts.com\)](mailto:info@longboardproducts.com); Web: www.longboardproducts.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00.

2.2 MATERIALS

- A. Extruded Aluminum Siding and Soffits: Longboard Wood Grain Aluminum Siding and Soffits with Alluminat bonded film finish is extruded aluminum with integrated venting system.
1. Size:
 - #101802 4" V Groove Siding & Soffit -12 pieces per box
 - #101973 6" Channel Siding & Soffit - 8 pieces per box
 - #102311 6" V Groove Siding & Soffit - 8 pieces per box
- B. Accessories: Prefinished aluminum: Provide with matching accessories and starter strips as required.
- 101957 2.5 inch perforated vent strip 12 ft length
 - 102304 2.5 inch V groove siding and soffit 12 ft length
 - 102000 J track 12 ft length
 - 102044 Wide Starter Strip 12 ft length
 - 102324 Inside Corner
 - 102305 Outside Corner
 - 102611 Finish Base & Cap (2pc set)
 - 102612 Base & U Cap (2pc set)
 - 102613 Base & Flat Cap (2pc set)
 - 102044 Powder Coated Wide Starter Strip
 - 102355 Quick Screen Clip

2.3 FINISHES; Lead time varies based on colour and supply. Please check with manufacture for anticipated lead time for solid and metallic colours.

- A. Pretreatment: E-CLPS Chrome Free five stage aluminum pretreatment system. Complies with AAMA 2603 AAMA 2604 and AAMA 2605 Superior Performance Standard and meets EPA, OSHA, State and Local environmental requirements and contains no chromates, cyanides or other heavy metals. Waste treatment is usually a simple pH neutralization and disposal to the sanitary sewer.
- B. Super Durable Powder Coatings: Alluminat Premium Wood Finishes use a polyurethane powder coat with ink based wood grain patterns sublimated into the base powder effectively tattooing the powder. The combined effect creates all the aesthetic aspects of real wood while offering the same environmental advantages of powder coated finishes.
1. Wood Grained

- a. Light Ash 1402/02-716

2.4 FABRICATION

- A. Prepare surfaces, pre-treat and coat components in accordance with AAMA 2604 and 2605 Quality Standards and applicable European standards for the coating material specified.
- B. Wrap and package coated components using methods suitable for transit and covered site storage without damage.

2.5 WARRANTY

- A. Installation: 10 Years
- B. Finish: 20 Years.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until colors have been verified.
- B. Verify framing members are ready to receive panel system.
- C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 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 material under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's installation instructions.
- B. Barrier Protection: Do not install over cementitious materials, dissimilar metals or pressure treated material without adequate barrier protection.
 - 1. Install building paper horizontally on walls to receive metal siding.
 - 2. Weather lap edges 6 inches (150 mm) and ends minimum 6 inches (150 mm).
 - 3. Stagger vertical joints of each layer.
 - 4. Securely staple, nail in place.
- C. Fasten siding to structural supports; aligned, level, and plumb.
- D. Locate joints over supports.
- E. Install expansion control joints where indicated.
- F. Use concealed fasteners unless otherwise approved by Architect.
- G. Install soffits, and accessories in accordance with best practice, with all joint

members plumb and true.

3.4 FIELD QUALITY CONTROL

- A. After installation of soffits, check entire surface for obvious flaws or defects.
- B. Replace and repair any problem areas, paying close attention to the substrate for causes of the problem.

3.5 CLEANING

- A. After application of soffits, clean as necessary to remove all fingerprints and soiled areas.
- B. Upon completion of soffit application, clean entire area, removing all scrap, packaging, and unused materials related to this work.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07 46 00

SECTION 07 52 10 HOT APPLIED BUILT-UP HYBRID ROOFING

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes the materials and application procedures for the installation of gravel surfaced hot asphalt applied built-up roofing with cold adhesives applied aggregate.

1.2 RELATED DOCUMENTS

- A. Drawings and contract documents, including Section 01 01 00 – Summary of Work, apply to this section when students do not occupy building for extended period of time.
- B. Related Sections Include the Following:
 - 1. Section 01 10 00 – Summary of Work
 - 2. Section 01 77 00 – Contract Closeout
 - 3. Section 05 31 00 – Steel Deck
 - 4. Section 05 50 00 – Metal Fabrication
 - 5. Section 06 10 00 – Rough Carpentry
 - 6. Section 07 22 00 – Roof and Deck Insulation
 - 7. Section 07 62 00 – Sheet Metal Flashing and Trim
 - 8. Section 07 92 00 – Sealants
 - 9. Section 09 91 00 – Paints and Coatings
 - 10. Division 22 – Roof Drains

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install a watertight, hot built-up roof and base flashing roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather.
- B. Roofing System must be tested by a third party testing agency and meet ASTM D 2523 for Load Strain Properties of Roof Membrane requirements of MD 586 lbf/in with 2.65% elongation and XMD 474 lbf/in with 2.67% elongation.
- C. Contractor must have a full time inspector on site for nine hours each day employed by the manufacturer during the actual installation of insulation, roof membrane, flashings, flood coat and gravel, and all sheet metal. Inspector must have been employed by the manufacturer for a five year period.

1.4 REFERENCES

- A. ASTM - American Society for Testing and Materials, West Conshohocken, PA.
- B. NRCA - National Roofing Contractors Association, Chicago, IL
- C. UL - Underwriter's Laboratory, Northbrook, IL.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed.

1.6 QUALITY ASSURANCE

- A. Roofing system manufacturer shall provide on site inspector for the duration of the roof installation.

1.7 WARRANTY

A. Warranty:

1. Upon project completion and Owner acceptance, effective upon complete payment the Roofing Contractor shall issue a guarantee against defective workmanship and materials for a period of five (5) years.
2. Manufacturer's standard form, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
 - a. Warranty shall include roofing membrane, base flashings, roofing membrane accessories, roof insulation, insulation adhesive, cover boards, substrate board, metal edgings, metal copings, walkway products and other components of roofing system as well as metal roofing system. The same manufacturer will provide warranty for Built Up Roof and Metal Roofing System.
 - b. Warranty Period: Twenty-Five (25) years from date of Substantial Completion with a No-Dollar Limit.
 - c. Manufacturer will inspect the roofing system in years 2, 5, 10, 15, and 20 and shall perform any preventive maintenance and housekeeping as necessary. A written report with photographs will be provided for each inspection.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Tremco, Inc.
 2. Firestone
 3. Johns Manville
 4. Approved equal by Owner.

2.2 FASTENERS

- A. Roof membrane to wood nailers:
1. Simplex Cap Nails for attachment into wood; Length: 1-1/4 inch
 2. Approved equal by Owner.
- B. Membrane to cementitious wood fiber, gypsum:
1. ES Products Base Sheet Fastener - Twin Loc-Nail with 2.7-inch disc. Min 1.7 inch in length.
 2. Approved equal by Owner.

2.3 BASE SHEET & FIRST PLY FELTS:

- A. Non-perforated, SBS modified, asphalt-coated, polyester/fiberglass/polyester reinforced sheet, dusted with fine mineral surfacing on both sides and meets the requirements of ASTM D 4601, Type II Trilaminar ply of polyester/fiberglass/polyester. Standard is Tremco Composite Ply Supreme or Approved Equal. Sheet must be a waterproof sheet.
1. One (1) ply
 2. Tensile Strength, minimum, ASTM D 5147: machine direction, 300 lbf/in (52.5 kN/m); cross machine direction, 270 lbf/in (47.3 kN/m).
 3. Tear Strength, minimum, ASTM D 5147: machine direction, 500 lbf (2.2 kN); cross machine direction, 500 lbf (2.2 kN).
 4. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 5147: machine direction, 7.0 percent; cross machine direction, 7.0 percent.
 5. Thickness, minimum, ASTM D 146: 0.05 inch (1.2 mm).

2.4 ROOF MEMBRANE PLIES

- A. Type VI felts: Heavy Duty non-rotting glass ply sheet exceeding the requirements of ASTM D2178, Type VI. Three (3) plies.

2.5 CAP MEMBRANE

- A. Thermoplastic PVC-KEE Sheet: Basis of design product: Tremco, TPA Roof Membrane: ASTM D 4434, Type IV, internally fabric reinforced, uniform, flexible TPA sheet, CRRC listed and California Title 24 Energy Code compliant.
 - 1. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 300 lbf/in (52 kN/m).
 - 2. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 6509: 100 lbf (0.44 kN).
 - 3. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D 6509: machine direction, 25 percent; cross machine direction, 25 percent.
 - 4. Thickness: 45 mils (1.1 mm), nominal.
 - 5. Exposed Face Color: White.
 - 6. Reflectance, ASTM C 1549: 86 percent.
 - 7. Thermal Emittance, ASTM C 1371: .86.
 - 8. Solar Reflectance Index (SRI), ASTM E 1980: 108

2.6 ASPHALT MATERIALS

- A. Membrane Adhesive:
 - 1. Type III Hot Asphalt.
 - a. Hot melt asphalt adhesive exceeding ASTM D 312-95a performance requirements.
 - b. Asphalt must have the “no smell” additive.
- B. Asphalt Primer:
 - 1. Water-Based Asphalt Primer: Water-based, polymer modified, asphalt primer
 - 2. Low volatile (VOC) primer - VOC Compliant Asphalt Primer: Solvent-based asphalt primer.
- C. Solvent-Free Elastomeric Roofing Mastic: One-part, solvent-free, asbestos-free, low-odor elastomeric roof mastic specially formulated for compatibility and use with specified roofing membranes and flashings.
- D. Asphalt Roofing Mastic: One-part, asbestos-free, cold-applied mastic specially formulated for compatibility and use with specified roofing membranes and flashings and meets the requirements of ASTM D 4586, Type II, Class 1.
- E. Temporary Tie-in Materials: G-2 base sheet - Non-perforated, asphalt-impregnated and coated glass-fiber sheet dusted with fine mineral surfacing on both sides and meets the requirements of ASTM D 4601, Type II.

2.7 WALK PADS

- A. Walkway Pads: Mineral-surfaced asphaltic composition panels, factory formed, non-porous, with a slip-resisting surface texture, manufactured specifically for adhering to built-up roofing as a protection course for foot traffic.

2.8 MISCELLANEOUS ACCESSORIES

- A. Provide miscellaneous accessories recommended by roofing system manufacturer.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which roofing will be applied, with installer present, for compliance with requirements.
- B. Verify that roof openings and penetrations are set in place and braced.
- C. Verify that roof drains are properly clamped into position.
- D. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thickness of insulation required.

3.2 PREPARATION

- A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install built-up roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA / NRCA's "Quality Control Guidelines for the Application of Built-Up Roofing".
- B. Install roofing system per manufacturer's published specifications manual.
- C. Wood fiber cants: Install and adhere preformed 45-degree fibered cants at all horizontal / vertical interfaces at projections and wall supported deck detail.
- D. Install and secure preformed 45-degree pressure-treated wood cants at horizontal / vertical interfaces of expansion joint and non-wall supported deck details.
- E. Coordinate installation of roofing system components so insulation and roofing plies are not exposed to precipitation or remain exposed at the end of the workday or when rain is forecast.
- F. Provide water cutoffs at end of each day's work to cover exposed ply sheets and insulation with a course of coated felt with joints and edges sealed.
- G. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
- H. Remove and discard temporary seals before beginning work on adjoining roofing.
- I. Asphalt heating:
 - 1. Maximum asphalt temperature: 25° F below the flash point.
 - 2. Avoid prolonged heating of asphalt at high temperatures. Reduce the asphalt temperature to below 500° F if asphalt is not being used for periods of 4 hours or more.
 - 3. Tanker: Free of contaminants.
 - 4. Application rates: Bitumen quantities for water stop/tie-offs, flashings, miscellaneous detail applications, and minimum kettle capacity are not included in application rates. Mopping rate - 25 pounds per 100 square feet plus or minus 20 percent.
 - 5. Heat and apply asphalt in accordance with equiviscous temperature (EVT) melted as recommended by NRCA. Temperature shall be EVT plus or minus 25° F at point of application. Discard bitumen that does not fall within this standard.
- J. Cold process adhesive heating:
 - 1. An in-line heat exchange unit may be used to facilitate application.

2. Maximum adhesive temperature: 100° F. Do not exceed the flash point of the adhesive.
 3. Heat exchange unit: Filled with heat transfer oil approved by equipment manufacturer.
 4. Follow operation procedures as recommended by equipment manufacturer.
- K. Substrate-Joint Penetrations: Prevent adhesive from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.4 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installing roofing insulation.
- C. Refer to Section 07 22 00 - Roof and Deck Insulation for detailed requirements.

3.5 ROOF MEMBRANE INSTALLATION

- A. Install ply felts according to roofing system manufacturer's written instructions, starting at low point of roofing system. Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges. Shingle side laps of ply felts uniformly to achieve required number of membrane plies throughout. Shingle in direction to shed water. Extend adhesive past lap edges to ensure complete and uniform adhesion. Extend ply felts over cants.
- B. Four (4) Ply Application:
 1. Install one ply of tri-laminate base ply set in uniform and continuous application of type III hot asphalt
 2. Install three (3) plies of Type VI felts parallel to the roof slope. Overlap starter strips 28 inches with first ply, and then overlap each succeeding ply 26.5 inches. Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges.
 3. Install plies to roof in a uniform and continuous application of ply adhesive.
 4. Use 9, 18, 27, and 36-inch wide plies to start and finish roof membrane along roof edges and terminations.
 5. Immediately after installation, broom and/or roll ply sheet. Ensure complete and continuous seal and contact between adhesive and felts, including ends, edges and laps without wrinkles, fish mouths, or blisters. Broom/roller width: 34 inches minimum.
 6. Apply uniform and continuous pressure to exposed edge and end laps to ensure complete adhesion.
 7. Avoid walking on plies until adhesive has set.
 8. Overlap previous day's work 24 inches.
 9. Lap ply membrane ends 4 inches. Stagger end laps three feet minimum.
 10. Embed each ply in a uniform and continuous application of ply adhesive at a rate of 25 lbs. per 100 square feet at EVT.

3.6 FULLY ADHERED CAP MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow it to relax before installing.
 1. Install sheet according to ASTM D 5036.
- B. Install PVC-KEE cap membrane into the hot rubberized asphalt while it is still viscous to insure a good monolithic membrane.

- C. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical personnel.
- D. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Mechanically or adhesively fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.
- H. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

3.7 FLASHING MEMBRANE INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Install PVC-KEE flashing membrane in the hot fluid base membrane while it is still viscous to insure a good monolithic membrane.
- C. Flash penetrations and field-formed inside and outside corners with sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 DAILY WATERSTOP/TIE-INS

- A. Remove embedded gravel/debris from top ply of felt along termination; Width: 18 inches
- B. Adhere 12 and 18 inch wide ply sheets from exposed deck to existing roofing with a continuous 1/16 thick application of tie-off mastic. Glaze cut-off with surfacing mastic. Extend 18 inch wide felt 3 inches either side of 12-inch felt.
- C. Install 'deadman' insulation filler at insulation staggers.
- D. Extend roofing system at least 12 inches onto prepared area of adjacent roofing. Seal edge with 6 inches wide reinforcing membrane embedded between alternate courses of tie-off mastic.
- E. Remove temporary connection at beginning of next workday by cutting felts evenly along edge of existing roof system. Remove 'deadman' insulation fillers.

3.9 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

3.10 PROTECTING AND CLEANING

- A. Protect built-up roofing membrane from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to project superintendent.
- B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.
- C. Clean over spray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Contractor shall be responsible for vehicles and other property found to be contaminated by adhesive.

END OF SECTION 07 52 10

SECTION 07 52 15 – HOT APPLIED PVC/KEE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes the materials and application procedures for the installation of gravel surfaced hot asphalt applied built-up roofing with cold adhesive applied aggregate.

B. Related Sections:

1. Drawings and contract documents, including Section 01 01 00 – Summary of Work, apply to this section when students do not occupy building for extended period of time.
2. Related Sections Include the Following:
 1. Section 01 10 00 – Summary of Work
 2. Section 01 77 00 – Contract Closeout
 3. Section 05 31 00 – Steel Deck
 4. Section 05 50 00 – Metal Fabrication
 5. Section 06 10 00 – Rough Carpentry
 6. Section 07 22 00 – Roof and Deck Insulation
 7. Section 07 62 00 – Sheet Metal Flashing and Trim
 8. Section 07 92 00 – Sealants
 9. Section 09 91 00 – Paints and Coatings
 10. Division 22 – Roof Drains

- C. Alternates: Refer to Division 01 Section "Alternates" for description of Work in this Section affected by alternates.

- D. Allowances: Refer to Division 01 Section "Allowances" for description of Work in this Section affected by allowances.

- E. Unit Prices: Refer to Division 01 Section "Unit Prices" for description of Work in this Section affected by unit prices.

11. DEFINITIONS

- F. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to built-up roofing.

12. PERFORMANCE REQUIREMENTS

- G. General Performance: Installed built-up roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Built-up roofing and base flashings shall remain watertight.

- 1) Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

- 2) Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.

- H. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by built-up roofing manufacturer based on testing and field experience.

- I. SPRI Wind Design Standard: Manufacture and install copings and roof-edge flashings tested according to SPRI ES-1.

- J. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

- K. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

- L. Energy Performance: Roofing system shall have an initial solar reflectance index of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.

- M. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a roofing system, and shall be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 - 3) Fire/Windstorm Classification: Class 1A-90.
 - 4) Hail Resistance Rating: MH.

- N. Flashings and Fastening: Comply with requirements of Division 07 Sections "Sheet Metal Flashing and Trim" and "Roof Specialties." Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
 - 5) FM Global 1-49: Loss Prevention Data Sheet for Perimeter Flashings.
 - 6) FM Global 1-29: Loss Prevention Data Sheet for Above Deck Roof Components.
 - 7) NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
 - 8) SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.

- O. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
 - 13. ACTION SUBMITTALS

- P. Product Data: For each type of product indicated.

- Q. LEED Submittals:
 - 1. Product Test Reports for Credit SS 7.2: For roof materials, indicating that roof materials comply with Solar Reflectance Index requirement.
 - 2. Product Data for Credit IEQ 4.1: For adhesives and sealants used inside the weatherproofing system, documentation including printed statement of VOC content.

- R. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck, orientation of membrane roofing, and fastening spacings and patterns for mechanically fastened components.
- 1) Base flashings and built-up terminations.
 - a) Indicate details meet requirements of NRCA and FMG required by this Section.
 - 2) Tapered insulation, including slopes.
 - 3) Crickets, saddles, and tapered edge strips, including slopes.
 - 4) Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

14. INFORMATIONAL SUBMITTALS

- S. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- T. Qualification Data: For Installer, Manufacturer, and Roofing Inspector. Include letter from Manufacturer written for this Project indicating approval.
- 1) Include letter from Manufacturer written for this Project indicating approval of Installer.
- U. Manufacturer Certificates: Signed by roofing manufacturer certifying that built-up roofing complies with requirements specified in "Performance Requirements" Article.
- 2) Submit evidence of compliance with performance requirements, including FMG system approval roofing membrane system load/strain property test report.
 - 3) Indicate that proposed system components are compatible.
- V. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.
- W. Warranties: Unexecuted sample copies of special warranties.
- X. Inspection Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

15. CLOSEOUT SUBMITTALS

- Y. Maintenance Data: To include in maintenance manuals.

16. QUALITY ASSURANCE

- Z. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years experience installing similar work, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to furnish warranty of type specified.
- AA. Manufacturer Qualifications: A qualified manufacturer that is UL listed FM Approvals approved for built-up roofing identical to that used for this Project.

- BB. Contractor must have a full time inspector on site for nine hours each day employed by the manufacturer during the actual installation of insulation, roof membrane, flashings, flood coat and gravel, and all sheet metal. The Inspector must have been employed by the manufacturer for a minimum of five years.
- CC. Source Limitations: Obtain roofing system components from or approved in writing by roofing system manufacturer.
- DD. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
 - 1) Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2) Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3) Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4) Review deck substrate requirements for conditions and finishes, including flatness and fastening.
 - 5) Review structural loading limitations of roof deck during and after roofing.
 - 6) Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
 - 7) Review governing regulations and requirements for insurance and certificates if applicable.
 - 8) Review temporary protection requirements for roofing during and after installation.
 - 9) Review roof observation and repair procedures after roofing installation.

17. DELIVERY, STORAGE, AND HANDLING

- EE. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- FF. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer. Protect stored liquid material from direct sunlight.
 - 1) Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- GG. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- HH. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

18. PROJECT CONDITIONS

- II. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.
- JJ. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 - 1) Provide tie-offs at end of each day's work to cover exposed roofing and insulation with a course of coated roofing sheet set in roofing cement or hot roofing asphalt with joints and edges sealed.
 - 2) Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 - 3) Remove temporary plugs from roof drains at end of each day.
 - 4) Remove and discard temporary seals before beginning work on adjoining roofing.

19. WARRANTY

- KK. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- LL. Roof System Warranty, General: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:
 - 1) Sheet metal flashing and trim, including roof penetration flashings.
 - 2) Manufactured copings, roof edge, counterflashings, and reglets.
 - 3) Roof curbs, hatches, and penetration flashings.
 - 4) Roof and parapet expansion joint assemblies.
 - 5) Metal roof, wall, and soffit panels and trim.
- MM. Special Warranty: Manufacturer's standard or customized form, without monetary limitation (NDL), in which manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
 - 6) Special warranty includes roofing membrane, base flashings, roofing membrane accessories roof insulation fasteners cover boards walkway products and other components of built-up roofing.
 - 7) Warranty Period: 25 years from date of Substantial Completion.
 - 8) Manufacturer will inspect the roofing system in years 2, 5, 10, 15, and 20 and shall perform any preventive maintenance and housekeeping as necessary. A web-based report with photographs will be provided for each inspection.

- NN. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
- 9) Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Tremco, Inc.
 2. Firestone
 3. Johns Manville
 4. Approved equal by Owner.

2.2 ROOF MEMBRANE

- A. Thermoplastic PVC-KEE Sheet: Basis of design product: Tremco, TPA Roof Membrane: ASTM D 4434, Type IV, internally fabric reinforced, uniform, flexible TPA sheet, CRRC listed and California Title 24 Energy Code compliant.
1. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 300 lbf/in (52 kN/m).
 2. Tear Strength at 77 deg. F (25 deg. C), minimum, ASTM D 6509: 100 lbf (0.44 kN).
 3. Elongation at 0 deg. F (-18 deg. C), minimum at fabric break, ASTM D 6509: machine direction, 25 percent; cross machine direction, 25 percent.
 4. Thickness: 60 mils
 5. Exposed Face Color: White.
 6. Reflectance, ASTM C 1549: 86 percent.
 7. Thermal Emittance, ASTM C 1371: .86.
 8. Solar Reflectance Index (SRI), ASTM E 1980: 108

2.3 ASPHALT MATERIALS

- A. Membrane Adhesive:
1. Type III Hot Asphalt.
 - a. Hot melt asphalt adhesive exceeding ASTM D 312-95a performance requirements.
 - b. Asphalt must have the "no smell" additive.
- B. Asphalt Primer:
1. Water-Based Asphalt Primer: Water-based, polymer modified, asphalt primer
 2. Low volatile (VOC) primer - VOC Compliant Asphalt Primer: Solvent-based asphalt primer.
- C. Solvent-Free Elastomeric Roofing Mastic: One-part, solvent-free, asbestos-free, low-odor elastomeric roof mastic specially formulated for compatibility and use with specified roofing membranes and flashings.

- D. Asphalt Roofing Mastic: One-part, asbestos-free, cold-applied mastic specially formulated for compatibility and use with specified roofing membranes and flashings and meets the requirements of ASTM D 4586, Type II, Class 1.
- E. Temporary Tie-in Materials: G-2 base sheet - Non-perforated, asphalt-impregnated and coated glass-fiber sheet dusted with fine mineral surfacing on both sides and meets the requirements of ASTM D 4601, Type II.

2.4 MISCELLANEOUS ACCESSORIES

- A. Provide miscellaneous accessories recommended by roofing system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which roofing will be applied, with installer present, for compliance with requirements.
- B. Verify that roof openings and penetrations are set in place and braced.
- C. Verify that roof drains are properly clamped into position.
- D. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thickness of insulation required.

3.2 PREPARATION

- A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA / NRCA's "Quality Control Guidelines for the Application of Single Ply Roofing".
- B. Install roofing system per manufacturer's published specifications manual.
- C. Coordinate installation of roofing system components so insulation and roofing plies are not exposed to precipitation or remain exposed at the end of the workday or when rain is forecast.
- D. Provide water cutoffs at end of each day's work to cover exposed ply sheets and insulation with a course of coated felt with joints and edges sealed.
- E. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
- F. Remove and discard temporary seals before beginning work on adjoining roofing.

- G. Asphalt heating:
 - 1. Maximum asphalt temperature: 25° F below the flash point.
 - 2. Avoid prolonged heating of asphalt at high temperatures. Reduce the asphalt temperature to below 500° F if asphalt is not being used for periods of 4 hours or more.
 - 3. Tanker: Free of contaminants.
 - 4. Application rates: Bitumen quantities for water stop/tie-offs, flashings, miscellaneous detail applications, and minimum kettle capacity are not included in application rates. Mopping rate - 25 pounds per 100 square feet plus or minus 20 percent.
 - 5. Heat and apply asphalt in accordance with equiviscous temperature (EVT) melted as recommended by NRCA. Temperature shall be EVT plus or minus 25° F at point of application. Discard bitumen that does not fall within this standard.

- H. Substrate-Joint Penetrations: Prevent adhesive from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.4 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installing roofing insulation.
- C. Refer to Section 07 22 00 - Roof and Deck Insulation for detailed requirements.

3.5 FULLY ADHERED PVC MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow it to relax before installing.
 - 1. Install sheet according to ASTM D 5036.
- B. Install PVC-KEE membrane into the hot rubberized asphalt while it is still viscous to insure a good monolithic membrane.
- C. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical personnel.
- D. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Mechanically or adhesively fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.

- H. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

3.6 FLASHING MEMBRANE INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Install PVC-KEE flashing membrane in the hot fluid base membrane while it is still viscous to insure a good monolithic membrane.
- C. Flash penetrations and field-formed inside and outside corners with sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 FIELD QUALITY CONTROL

- A. Roofing Inspector: Contractor shall engage a qualified roofing inspector every day roof work is performed to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
 - 1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.
 - 1. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTING AND CLEANING

- A. Protect built-up roofing from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, and repair or reinstall roofing to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 52 15

SECTION 07 62 00 - SHEET METAL FLASHING, TRIM AND COPINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes sheet metal flashing and trim in the following categories:
 - 1. Exposed aluminum trim, fascia and soffits.
 - 2. Aluminum Copings.
 - 3. Metal flashing.
 - 4. Metal Downspouts (Entrance canopy).
- B. Related Sections: The following Sections contain requirements that relate to this Section
 - 1. Division 7 Roofing Sections for flashing and roofing accessories installed integral with roofing membrane as part of roofing-system work.
 - 2. Division 7 Section "Joint Sealants" for elastomeric sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.
- B. Fabricate and install flashings at roof edges to comply with recommendations of FM Loss Prevention Data Sheet 1-49 for the following wind zone:
 - 1. Wind Zone 2.

1.4 SUBMITTALS

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

1. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
 - a. Aluminum extrusions that contain at least 60% post-industrial recycled content
3. Regional Materials MR Credit 5.1: Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- C. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.
- D. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.
 1. 8-inch- (200-mm-) square Samples of specified sheet materials to be exposed as finished surfaces.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project for a period of no less than five (5) years, with a record of successful in-service performance.
- B. Mockups: Prior to installing sheet metal flashing and trim, construct mockups indicated to verify selections made under Sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
 1. Locate mockups on-site in the location and of the size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect one week in advance of the dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Construct mockups for the following type of sheet metal flashing and trim:
 - a. Exposed trim, gravel stops, and fasciae.
 - b. Copings.
 5. Obtain Architect's approval of mockups before start of final unit of Work.

1.6 PROJECT CONDITIONS

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 METALS

- A. Stainless-Steel Sheet: ASTM A 167, Type 304, soft annealed, with No. 2D finish, except where harder temper is required for forming or performance; minimum 0.0187 inch (0.5 mm) thick, unless otherwise indicated.
- B. Coil-Coated Galvanized Steel Sheet: Zinc-coated, commercial-quality steel sheet conforming to ASTM A 755, G 90 (ASTM A 755M, Z 275) coating designation, coil coated with high-performance fluoropolymer coating as specified in "Coil-Coated Galvanized Steel Sheet Finish" Article; not less than 0.0336 inch (0.85 mm) thick, unless otherwise indicated. Use in conjunction with metal wall panels, and where trim is to match wall panel color.
- C. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet, with a minimum thickness of 0.0625 inch (1.6 mm) except not less than 0.0937 inch (2.4 mm) thick for applications where burning (welding) is involved.

D. Rolled Zinc Alloy Sheet/Coil:

- 1. Titanium-Zinc Alloy containing approximately 99% electrolytic SHG Zinc (with 99.995% degree of purity) with additives of copper (0.08% - 1.0%), titanium (0.07% - 0.12%), and aluminum (0.001% - 0.015%) in accordance with ASTM B69-11, Type 1 and Type 2 (containing higher copper content).

Manufactured Surface Aesthetic:

- a. PrePatina Rolled Zinc produced by submerging rolled Zinc Alloy in acid solution (etching/ pickling process) without the use of phosphates or pigmented color coatings.
 - 1. RHEINZINK prePATINA Graphite Grey (PPGG), ASTM B69 - 11, type 2 (Dark RHEINZINK)
- 2. Minimum Zinc sheet thickness based on profile's primary face dimension:
 - a. 0.7mm (24 ga.) [for face width < 8"]
 - b. 0.8 mm (22 ga.) [for face width < 12"]
 - c. 1.0 mm (20 ga.) [for face width < 18"]
- 3. Minimum Flashing Thickness: 0.7 mm (24 ga.) [0.8 mm (22 ga.)] or as required to minimize oil-canning & provide acceptable wind resistance.

2.2 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Shop fabricate interior and exterior corners.
 - 1. Fabricate from the Following Materials: TBD
 - a. Aluminum: 0.050 inch (1.27 mm)] thick.
 - b. Aluminum-Zinc Alloy-Coated Steel: 0.040 inch (1.02 mm).

2.3 ROOF-EDGE DRAINAGE SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Berger Building Products, Inc. 805 Pennsylvania Blvd, Feasterville, PA 19053
 2. Andreas Renner KG.
 3. Architectural Products Company.
 4. ATAS International, Inc.
 5. Castle Metal Products.
 6. Cheney Flashing Company.
 7. CopperCraft by FABRAL; a Euramax company.
 8. Hickman Company, W. P.
 9. Klauer Manufacturing Company.
 10. Metal-Era, Inc.
 11. Metal-Fab Manufacturing, LLC.
 12. MM Systems Corporation.
 13. National Sheet Metal Systems, Inc.
- B. Downspouts: Plain round complete with machine-crimped elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
1. Formed Aluminum: 0.063 inch thick.
 2. Size: 6" round

2.4 REGLETS

- A. General: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counter-flashing pieces and compatible with flashing indicated.
- B. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
- C. Counter-flashing Wind-Restraint Clips: Provide clips to be installed before counter-flashing to prevent wind uplift of the counter-flashing lower edge.
1. Material: Stainless steel, 0.0187 inch (0.5 mm) thick.
- D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Fry Reglet Corporation.
 2. Hickman: W.P. Hickman Co. 3. Keystone Flashing Company.

2.4 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Burning Rod for Lead: Same composition as lead sheet.

- B. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a noncorrosive rosin flux over tinned surfaces.
- C. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.
- D. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.
- E. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants."
- F. Epoxy Seam Sealer: 2-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.
- G. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- (0.15-mm-) thick black polyethylene film, resistant to decay when tested according to ASTM E 154.
- H. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching - or compatible with material being installed; noncorrosive; size and thickness required for performance.

2.5 FABRICATION, GENERAL

- A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.
- B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.
- D. Seams: Fabricate nonmoving seams in stainless steel sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- E. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- F. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- G. Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

- H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
- I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.
 - 1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.6 SHEET METAL FABRICATIONS

- A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.
- B. Splash Pans: Fabricate from the following material: 1. Stainless Steel: 0.0187 inch (0.5 mm) thick.
- C. Roof-Drain Flashing: Fabricate from the following material:
 - 1. Lead: 4.0 lb/sq. ft. (1.6 mm thick), hard tempered.
- D. Scuppers: Fabricate from the following material: 1. Aluminum: 0.050 inch (1.2 mm) thick.
- E. Exposed Trim, Gravel Stops, and Fasciae: Fabricate from the following material:
 - 1. Aluminum: 0.050 inch (1.2 mm) thick.
- F. Copings: Fabricate from the following material: 1. Aluminum: 0.050 inch (1.2 mm) thick.
- G. Counter-flashing: Fabricate from the following material:
 - 1. Stainless Steel: 0.0187 inch (0.5 mm) thick.
- H. Flashing Receivers: Fabricate from the following material:
 - 1. Stainless Steel: 0.0156 inch (0.4 mm) thick.
- I. Drip Edges: Fabricate from the following material:
 - 1. Aluminum: 0.0320 inch (0.8 mm) thick.
- J. Equipment Support Flashing: Fabricate from the following material:
 - 1. Stainless Steel: 0.0187 inch (0.5 mm) thick.
- K. Roof-Penetration Flashing: Fabricate from the following material:
 - 1. Stainless Steel: 0.0187 inch (0.5 mm) thick.
- L. Overhead-Piping Safety Pans: Fabricate from the following material:
 - 1. Stainless Steel: 0.0250 inch (0.65 mm) thick.
- M. Stainless Steel: 0.0250 inch (0.65 mm) thick.

2.7 COPINGS

- A. Copings: Manufactured coping system consisting of formed-metal coping cap in section lengths not exceeding **12 feet (3.6 m)**, concealed anchorage; corner units, end cap units, and concealed splice plates with same finish as coping caps.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 2. Basis-of-Design Product: Subject to compliance with requirements, provide Hickman preformed aluminum interlock multi-part coping system. Provide 24 gauge zinc coated steel anchor plate. Provide formed aluminum gutter.
 3. Equal products by the following manufacturers:
 - a. Architectural Products Company.
 - b. ATAS International, Inc.
 - c. Castle Metal Products.
 - d. Cheney Flashing Company.
 - e. Hickman Company, W. P.
 - f. Johns Manville.
 - g. Merchant & Evans, Inc.
 - h. Metal-Era, Inc.
 - i. Metal-Fab Manufacturing, LLC.
 - j. MM Systems Corporation.
 - k. National Sheet Metal Systems, Inc.
 - l. Perimeter Systems; a division of Southern Aluminum Finishing Company, Inc.
 - m. Petersen Aluminum Corporation.
 4. Coping-Cap Material: Formed aluminum, thickness as required to meet performance requirements.
 - a. Finish: Three-coat fluoropolymer.
 5. Corners: Factory mitered and continuously welded.
 6. Coping-Cap Attachment Method: Face leg hooked to continuous cleat with back leg fastener exposed, fabricated from coping-cap material.
 7. Snap-on-Coping Anchor Plates: Concealed, galvanized-steel sheet, **12 inches (300 mm)** wide, with integral cleats.
 8. Face Leg Cleats: Concealed, continuous galvanized-steel sheet.

2.8 REGLETS AND COUNTERFLASHINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Castle Metal Products.
 2. Cheney Flashing Company.
 3. Fry Reglet Corporation.
 4. Heckmann Building Products Inc.
 5. Hickman Company, W. P.

6. Keystone Flashing Company, Inc.
 7. Metal-Era, Inc.
 8. Metal-Fab Manufacturing, LLC.
 9. MM Systems Corporation.
 10. National Sheet Metal Systems, Inc.
- B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
11. Formed Aluminum: 0.050 inch (1.27 mm).
- C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) and in lengths not exceeding 12 feet designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped, from the following exposed metal:
1. Formed Aluminum: 0.032 inch (0.81 mm thick).
- D. Accessories:
1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
 2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
- E. Aluminum Finish: Three-coat fluoropolymer.
1. Color: Match Architect's sample.
- 2.9 ALUMINUM FINISHES
- A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.
- B. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
1. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermo-cured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range of choices for color and gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place, by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pre-tinned surface would show in finished Work.
1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- E. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- F. Separations: Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.
2. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.
- G. Install reglets to receive counter-flashing according to the following requirements:
1. Where reglets are shown in concrete, furnish reglets for installation under Division 3 Section "Cast-in-Place Concrete."

2. Where reglets are shown in masonry, furnish reglets for installation under Division 4 Section "Unit Masonry."
- H. Counter-flashings: Coordinate installation of counter-flashings with installation of assemblies to be protected by counter-flashing. Install counter-lashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counter-flashing joints a minimum of 2 inches (50 mm) and bed with sealant.
 - I. Equipment Support Flashing: Coordinate equipment support flashing installation with roofing and equipment installation. Weld or seal flashing to equipment support member.
 - J. Roof-Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating roof. Install flashing as follows:
 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
 2. Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.
 - K. Splash Pans: Install where downspouts discharge on low-sloped roofs, unless otherwise shown. Set in roof cement or sealant compatible with roofing membrane.
- 3.3 CLEANING AND PROTECTION
- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
 - B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION

SECTION 07 72 10 – ROOF HATCH

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included: Provide factory-fabricated roof hatches for ladder access.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data.
- B. Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.
- C. Warranty: Submit executed copy of manufacturer's standard warranty.

1.3 QUALITY ASSURANCE

- A. Manufacturer: A minimum of 5 years experience manufacturing similar products.
- B. Installer: A minimum of 2 years experience installing similar products.
- C. Manufacturer's Quality System: Registered to ISO 9001:2008 Quality Standards including in-house engineering for product design activities.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-vented area. Inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.5 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis-of-Design Manufacturer: Type S Roof Hatch by The Bilco Company, P.O. Box 1203, New Haven, CT 06505, 1-800-366-6530, Fax: 1-203-933-8478, Web: www.bilco.com.
 - 1. Contact: Rob MacDonald, tel. (410) 995-6400, company: CBG South Inc., address: 9689 Gerwig Lane, Maryland 21046

2.2 ROOF HATCH

- A. Furnish and install where indicated on plans metal roof hatch, size width: 30" x length: 54". Length denotes hinge side. The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.
- B. Performance characteristics:
 - 1. Cover shall be reinforced to support a minimum live load of 40 psf (195kg/m²) with a maximum deflection of 1/150th of the span and a 140 psf (684 kg/m²) wind uplift for galvanized steel (Type S-20).
 - 2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 - 3. Operation of the cover shall not be affected by temperature.
 - 4. Entire hatch shall be weather tight with fully welded corner joints on cover and curb.
- C. Cover: Shall be 14 gauge (1.9mm) paint bond G-90 galvanized steel with a 3" (76mm) beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
- D. Cover insulation: Shall be fiberglass of 1" (25mm) thickness, fully covered and protected by a metal liner 22 gauge (.8mm) paint bond G-90 galvanized steel.
- E. Curb: Shall be 12" (305mm) in height and of 14 gauge (1.9mm) paint bond G-90 galvanized steel. The curb shall be formed with a 3-1/2" (89mm) flange with 7/16" (11.1mm) holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip[®] flashing system, including stamped tabs, 6" (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.
- F. Curb insulation: Shall be rigid, high-density fiberboard of 1" (25mm) thickness on outside of curb.
- G. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe for steel construction: through bolted to the curb assembly.
- H. Hardware
 - 1. Heavy pintle hinges shall be provided
 - 2. Cover shall be equipped with a spring latch with interior and exterior turn handles
 - 3. Roof hatch shall be equipped with interior padlock hasps.
 - 4. The latch strike shall be a stamped component bolted to the curb assembly.
 - 5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" (25mm) diameter red vinyl grip handle to permit easy release for closing.
 - 6. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed.
 - 7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

- I. Finishes: Factory finish powder coat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
 - 1. Test units for proper function and adjust until proper operation is achieved.
 - 2. Repair finishes damaged during installation.
 - 3. Restore finishes so no evidence remains of corrective work.

3.3 ADJUSTING AND CLEANING

- A. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

END OF SECTION 07 72 10

SECTION 07 81 00 - SPRAYED FIRE-RESISTIVE MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes sprayed fire-resistive materials applied to structural steel members that are located in or pass thru fire rated separations and enclosures.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit EQ 4.2: For paints and coatings, documentation including printed statement of VOC content.
 - 2. Laboratory Test Reports for Credit EQ 4: For paints and coatings used inside the weatherproofing system, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Shop Drawings: Show extent of sprayed fire-resistive material for each construction and fire-resistance rating, applicable fire-resistive design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction, and minimum thicknesses.
- D. Compatibility and adhesion test reports.
- E. Product test reports.
- F. Research/evaluation reports.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer, approved by manufacturer to install manufacturer's products. A manufacturer's willingness to sell its sprayed fire-resistive materials to Contractor or to an installer engaged by Contractor does not in itself confer qualification on the buyer.
- B. Sprayed Fire-Resistive Materials Testing: By a qualified testing and inspecting agency engaged by Contractor or manufacturer to test for compliance with specified requirements for performance and test methods.
 - 1. Sprayed fire-resistive materials are randomly selected for testing from bags bearing the applicable classification marking of UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

- C. Compatibility and Adhesion Testing: Engage a qualified testing and inspecting agency to prepare compatibility and adhesion test reports.
 - 1. Test for bond per ASTM E 736 and requirements in UL's "Fire Resistance Directory" for coating materials. Provide bond strength indicated in referenced fire-resistance design, but not less than minimum specified in Part 2.
 - 2. Verify that manufacturer, through its own laboratory testing or field experience, has not found primers or coatings to be incompatible with sprayed fire-resistive material.
- D. Fire-Test-Response Characteristics: Where indicated, provide products identical to those tested for fire resistance per ASTM E 119 by a testing agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
 - 2. Identify products with appropriate markings of applicable testing and inspecting agency.
- E. Provide products containing no detectable asbestos as determined according to the method specified in 40 CFR 763, Subpart E, Appendix E, Section 1, "Polarized Light Microscopy."
- F. Mockups: Apply mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Apply mockup of 100 sq. ft. for each product indicated
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- G. Preinstallation Conference: Conduct conference at Project site.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply sprayed fire-resistive material when ambient or substrate temperature is 40 deg F or lower unless temporary protection and heat is provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilate building spaces during and after application of sprayed fire-resistive material. Use natural means or, if they are inadequate, forced-air circulation until fire-resistive material dries thoroughly.
- C. Sequence and coordinate application of sprayed fire-resistive materials with related work.
 - 1. Provide temporary enclosure as required to confine spraying operations and protect the environment.
 - 2. Provide temporary enclosures for applications to prevent deterioration of fire-resistive material due to exposure to weather and to unfavorable ambient conditions for humidity, temperature, and ventilation.
 - 3. Avoid unnecessary exposure of fire-resistive material to abrasion and other damage likely to occur during construction operations subsequent to its application.
 - 4. Do not apply fire-resistive material to metal roof deck substrates until concrete topping, if any, has been completed. For metal roof decks without concrete topping, do not apply

fire-resistive material to metal roof deck substrates until roofing has been completed; prohibit roof traffic during application and drying of fire-resistive material.

5. Do not apply fire-resistive material to metal floor deck substrates until concrete topping has been completed.
6. Do not begin applying fire-resistive material until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.
7. Defer installing ducts, piping, and other items that would interfere with applying fire-resistive material until application of fire protection is completed.
8. Do not install enclosing or concealing construction until after fire-resistive material has been applied, inspected, tested and corrections have been made to defective applications.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form, signed by Contractor and by Installer, in which manufacturer agrees to repair or replace sprayed fire-resistive materials that fail in materials or workmanship within two (2) years from date of Substantial Completion.
 1. Failures include, but are not limited to, cracking, flaking, spalling, eroding in excess of specified requirements; peeling; or delaminating of sprayed fire-resistive materials from substrates.
 2. Not covered under the warranty are failures due to damage by occupants and Owner's maintenance personnel and other causes not reasonably foreseeable under conditions of normal use.

PART 2 - PRODUCTS

2.1 CONCEALED SPRAYED FIRE-RESISTIVE MATERIALS

- A. General: For concealed applications of sprayed fire-resistive materials, provide manufacturer's standard products complying with requirements indicated for material composition and physical properties representative of installed products.
- B. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:
 2. Sprayed-Fiber Fire-Resistive Material:

Representative Product:

 - a. Isolatek International Corp., Cafco Products;
 - 1) CAFCO® Blaze-Shield® II
 - 2) LEED MR Credit 4.1 and 4.2: Recycled Content, Post-Industrial: 67%.

Equal Product:

 - b. "Spray Don Standard J"; American Energy Products Corp.

- D. Material Composition:
1. Sprayed-fiber fire-resistive material consisting of factory-mixed, dry formulation of inorganic binders, mineral fibers, fillers, and additives conveyed in a dry state by pneumatic equipment and mixed with water at spray nozzle to form a damp, as-applied product.
- E. Physical Properties: Minimum values, unless otherwise indicated, or higher values required to attain designated fire-resistance ratings, measured per standard test methods referenced with each property as follows:
1. Dry Density: 15 lb/cu. ft. for average and individual densities regardless of density indicated in referenced fire-resistance design, or greater if required to attain fire-resistance ratings indicated, per ASTM E 605 or AWCI Technical Manual 12-A, Section 5.4.5, "Displacement Method."
 2. Thickness: Provide minimum average thickness required for fire-resistance design indicated according to the following criteria, but not less than 0.375 inch, per ASTM E 605:
 - a. Where the referenced fire-resistance design lists a thickness of 1 inch or greater, the minimum allowable individual thickness of sprayed fire-resistive material is the design thickness minus 0.25 inch
 - b. Where the referenced fire-resistance design lists a thickness of less than 1 inch but more than 0.375 inch, the minimum allowable individual thickness of sprayed fire-resistive material is the greater of 0.375 inch or 75 percent of the design thickness.
 - c. No reduction in average thickness is permitted for those fire-resistance designs whose fire-resistance ratings were established at densities of less than 15 lb/cu. ft.
 3. Bond Strength: 150 lbf/sq. ft. (7.2 kPa) minimum per ASTM E 736 under the following conditions:
 - a. Field test sprayed fire-resistive material that is applied to flanges of wide-flange, structural-steel members on surfaces matching those that will exist for remainder of steel receiving fire-resistive material.
 - b. If surfaces of structural steel receiving sprayed fire-resistive material are primed or otherwise painted for coating materials, perform series of bond tests specified in UL's "Fire Resistance Directory." Provide bond strength indicated in referenced UL fire-resistance criteria, but not less than 150 lbf/sq. ft. (7.2 kPa) minimum per ASTM E 736.
 - c. Minimum thickness of sprayed fire-resistive material tested in laboratory shall be 0.75 inch (19 mm).
 4. Compressive Strength: 5.21 lbf/sq. in. (35.9 kPa) as determined in the laboratory per ASTM E 761. Minimum thickness of sprayed fire-resistive material tested shall be 0.75 inch and minimum dry density shall be as specified, but not less than 15 lb/cu. ft.
 5. Corrosion Resistance: No evidence of corrosion per ASTM E 937.
 6. Deflection: No cracking, spalling, or delamination per ASTM E 759.
 7. Effect of Impact on Bonding: No cracking, spalling, or delamination per ASTM E 760.
 8. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours per ASTM E 859. For laboratory tests, minimum thickness of sprayed fire-resistive material is 0.75 inch (19 mm), maximum dry density is 15 lb/cu. ft. (240 kg/cu. m), test specimens are not prepurged by mechanically induced air velocities, and tests are terminated after 24 hours.
 9. Fire-Test-Response Characteristics: Provide sprayed fire-resistive materials with the following surface-burning characteristics as determined by testing identical products per

ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

- a. Flame-Spread Index: 10 or less
 - b. Smoke-Developed Index: 0
10. Fungal Resistance: No observed growth on specimens per ASTM G 21.
11. Blue Tint: All spray fireproofing shall be tinted blue.
12. Thickness: As necessary to provide a 2 Hour fire Rating.

2.2 AUXILIARY FIRE-RESISTIVE MATERIALS

- A. General: Provide auxiliary fire-resistive materials that are compatible with sprayed fire-resistive materials and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: For use on each substrate and with each sprayed fire-resistive product, provide primer that complies with one or more of the following requirements:
 - 1. Primer's bond strength complies with requirements specified in UL's "Fire Resistance Directory," for coating materials based on a series of bond tests per ASTM E 736.
 - 2. Primer is identical to those used in assemblies tested for fire-test-response characteristics of sprayed fire-resistive material per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Adhesive for Bonding Fire-Resistive Material: Product approved by manufacturer of sprayed fire-resistive material.
- D. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required to comply with fire-resistance designs indicated and fire-resistive material manufacturer's written recommendations. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive sprayed fire-resistive material.
- E. Sealer for Sprayed-Fiber Fire-Resistive Material: Transparent-drying, water-dispersible protective coating recommended in writing by manufacturer of sprayed-fiber fire-resistive material.
 - 1. Product: Subject to compliance with requirements, provide "Cafco Bond-Seal" by Isolotek International Corp.; Cafco Products.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates, areas, and conditions, with Installer present, to determine whether they are in satisfactory condition to receive sprayed fire-resistive material and to verify the following:

1. Substrates are free of oil, grease, rolling compounds, incompatible primers, loose mill scale, dirt, or other foreign substances capable of impairing bond of fire-resistive materials with substrates under conditions of normal use or fire exposure.
 2. Objects penetrating fire-resistive material, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
 3. Substrates are not obstructed by ducts, piping, equipment, and other suspended construction that will interfere with applying fire-resistive material.
- B. Clean substrates of substances that could impair bond of fire-resistive material, including dirt, oil, grease, release agents, rolling compounds, loose mill scale, and incompatible primers, paints, and encapsulants.
- C. Conduct tests according to fire-resistive material manufacturer's written recommendations to verify that substrates are free of oil, rolling compounds, and other substances capable of interfering with bond.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
- E. Cover other work subject to damage from fallout or overspray of fire-resistive materials during application.
- F. Install metal lath, as required, to comply with fire-resistance ratings and fire-resistive material manufacturer's written recommendations for conditions of exposure and intended use. Securely attach lath to substrate in position required for support and reinforcement of fire-resistive material. Use anchorage devices of type recommended in writing by sprayed fire-resistive material manufacturer. Attach lathing accessories where indicated or required for secure attachment to substrate.
- G. Coat substrates with adhesive before applying fire-resistive material where required to achieve fire-resistance rating or as recommended in writing by sprayed fire-resistive material manufacturer for material and application indicated.
- H. Extend fire-resistive material in full thickness over entire area of each substrate to be protected. Unless otherwise recommended in writing by sprayed fire-resistive material manufacturer, install body of fire-resistive covering in a single course.
- I. Spray apply fire-resistive materials to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by sprayed fire-resistive material manufacturer.
- J. Where structural steel members having different thicknesses of sprayed-on fireproofing intersect or connect, provide sprayed-on fireproofing on all members for a distance of two (2) feet minimum from the junction of the members."
- K. Where sealers are used, apply products that are tinted to differentiate them from sprayed fire-resistive material over which they are applied.
- L. Apply concealed sprayed fire-resistive material in thicknesses and densities not less than those required to achieve fire-resistance ratings designated for each condition, but apply in greater thicknesses and densities if specified in Part 2 "Concealed Sprayed Fire-Resistive Materials" Article.

- M. Where the structural member is smaller than the minimum size specified for UL Design System detailed on the drawings apply additional thickness of spray fireproofing in accordance with the UL Directory formula for "Adjustment of Thickness of Spray-applied Fire Resistive Materials Thickness for Restrained and Unrestrained Beams" found in the Introduction of the UL Directory.
- N. Apply sealer to concealed sprayed fire-resistive material.
- O. Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- P. Repair or replace work that has not been successfully protected.

3.2 FIELD QUALITY CONTROL

- A. Testing Agency: CM will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
- B. Testing Services: Testing and inspecting of completed applications of sprayed fire-resistive material shall take place in successive stages, in areas of extent and using methods as follows. Do not proceed with application of sprayed fire-resistive material for the next area until test results for previously completed applications of sprayed fire-resistive material show compliance with requirements. Tested values must equal or exceed values indicated and required for approved fire-resistance design.
 - 1. Thickness for Floor, Roof, and Wall Assemblies: For each 1000-sq. ft. (93-sq. m) area, or partial area, on each floor, from the average of 4 measurements from a 144-sq. in. (0.093-sq. m) sample area, with sample width of not less than 6 inches (152 mm) per ASTM E 605.
 - 2. Thickness for Structural Frame Members: From a sample of 25 percent of structural members per floor, taking 9 measurements at a single cross section for structural frame beams or girders, 7 measurements of a single cross section for joists and trusses, and 12 measurements of a single cross section for columns per ASTM E 605.
 - 3. Density for Floors, Roofs, Walls, and Structural Frame Members: At frequency and from sample size indicated for determining thickness of each type of construction and structural framing member, per ASTM E 605 or AWCI Technical Manual 12-A, Section 5.4.5, "Displacement Method."
 - 4. Bond Strength for Floors, Roofs, Walls, and Structural Framing Members: For each 10,000-sq. ft. (929 sq. m) area, or partial area, on each floor, cohesion and adhesion from one sample of size indicated for determining thickness of each type of construction and structural framing member, per ASTM E 736.
 - 5. If testing finds applications of sprayed fire-resistive material are not in compliance with requirements, testing and inspecting agency will perform additional random testing to determine extent of noncompliance.
- C. Remove and replace applications of sprayed fire-resistive material where test results indicate that it does not comply with specified requirements for cohesion and adhesion, for density, or for both.
- D. Apply additional sprayed fire-resistive material per manufacturer's written instructions where test results indicate that thickness does not comply with specified requirements.

- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

END OF SECTION 07 81 10

SECTION 07 84 13 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in smoke barriers.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittal:
 - 1. Product Data for Credit EQ 4.1: For penetration firestopping, including printed statement of VOC content and chemical components.
- C. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
 - 1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- B. Firestopping products: All firestopping in the building including that for the mechanical, plumbing, electrical, and sprinkler subcontractors shall be done by one (1) contractor with products by one (1) manufacturer to insure uniformity in installation and products.

- C. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:
1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
 2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
 - b. Classification markings on penetration firestopping correspond to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek ETL SEMKO in its "Directory of Listed Building Products."
 - 3) FM Global in its "Building Materials Approval Guide."

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.6 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. A/D Fire Protection Systems Inc.
 2. Grace Construction Products.
 3. Hilti, Inc.
 4. Johns Manville.
 5. Nelson Firestop Products.
 6. NUCO Inc.
 7. Passive Fire Protection Partners.

8. RectorSeal Corporation.
9. Specified Technologies Inc.
10. 3M Fire Protection Products.
11. Tremco, Inc.; Tremco Fire Protection Systems Group.
12. USG Corporation.

2.2 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 1. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls and fire partitions.
 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 1. Horizontal assemblies include floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies].
 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.
- E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.
- F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- G. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 1. Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 3. Sealant Primers for Porous Substrates: 775 g/L.

- H. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-wool-fiber or rock-wool-fiber insulation.
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants.
 2. Temporary forming materials.
 3. Substrate primers.
 4. Collars.
 5. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

2.4 MIXING

- A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.

3.5 FIELD QUALITY CONTROL

- A. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.
- B. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.

- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and provisions of the Contract, including all Division 0 – Terms and Conditions Specification Sections and Division 1 – General Requirements Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealants, fillers and adhesives for the following applications, including those specified by reference to this Section:
 - 1. Interior joints in the following vertical surfaces and horizontal surfaces:
 - a. Control and expansion joints on exposed surfaces of masonry walls.
 - b. Joints where countertops abut vertical surfaces.
 - c. Perimeter joints between interior wall surfaces and frames of interior doors windows, elevator entrances and wood bases.
 - d. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - e. Tile control and expansion joints.
 - f. Stone threshold setting.
- B. Related Sections include the following:
 - 1. Division 8 Section “Glazing” for butt glazing sealant.
 - 2. Division 7 Section “ Built up Asphalt Roofing System” for roof expansion joints.
 - 3. Division 9 Section "Gypsum Board Assemblies" for locations of perimeter joints of gypsum board partitions to reduce sound transmission, with products specified in this section.
 - 4. Division 8 Sections “Wood Doors” and Hollow Metal Doors and Frames for sealants applied to junction of door frames and partitions.
 - 5. Division 32 for exterior site related sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.1: For sealants and sealant primers used inside the weatherproofing system, documentation including printed statement of VOC content.
 - 2. Laboratory Test Reports for Credit IEQ 4: For sealants and sealant primers used inside the weatherproofing system, documentation indicating that they comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- D. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- E. Field Test Report Log: For each elastomeric sealant application.
- F. Warranties: Special warranties specified in this Section.

1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

- G. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- H. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 5 years from date of Substantial Completion.
- I. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
- C. Architectural Sealants:
1. Toxicity/IEQ:
 - a. Comply with applicable regulations regarding toxic and hazardous materials, and as specified. Sealants must meet or exceed requirements South Coast Air Quality Management District (SCAQMD) #1168.
 - b. Sealants containing aromatic solvents, fibrous talc, formaldehyde, halogenated solvents, mercury, lead, cadmium, chromium and their compounds, are not permitted.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

- C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, and for all countertop sealants provide products that comply with 21 CFR 177.2600.

- D. Single-Component Neutral-Curing Silicone Sealant [ES-1]:
 - 1. Available Products:
 - a. GE Silicones; SilPruf SCS2000.
 - b. Pecora Corporation; 864.
 - c. Pecora Corporation; 890.
 - d. Polymeric Systems Inc.; PSI-641.
 - e. Sonneborn, Division of ChemRex Inc.; Omniseal.
 - f. Tremco; Spectrem 3.
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 50.
 - 4. Use Related to Exposure: NT (nontraffic).

- E. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant [ES-4]:
 - 1. Products:
 - a. Dow Corning; 786 Mildew Resistant.
 - b. Pecora Corporation; 898.
 - c. Tremco; Tremsil 600.
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 25.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, G, A, and O.

2.4 LATEX JOINT SEALANTS

- A. Latex Sealant [LS]: Comply with ASTM C 834, Type P, Grade NF.

- B. Available Products:
 - 1. Bostik Findley; Chem-Calk 600.
 - 2. Pecora Corporation; AC-20+.
 - 3. Schnee-Morehead, Inc.; SM 8200.
 - 4. Sonneborn, Division of ChemRex Inc.; Sonolac.
 - 5. Tremco; Tremflex 834.

2.5 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant [AS] for Exposed and Concealed Joints AS] Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:
 - 1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

2. Elastomeric Flexible Clear Sealants:
 - a. Sound Specialties Coatings Corporation: Slickthane high solids polyurethane-acrylic blend, single component ambient or heat cure, zero to low VOC, waterborne.

B. Non-hardening fire-stop sealant:

1. Gun or trowel-applied intumescent sealant: 3M "CPW-25WB+" or approved equal.
2. Moldable intumescent putty: 3M "Fire Barrier Moldable Putty+" or approved equal.
3. Non-intumescent silicone sealant: 3M "Silicone Fire Stop", USG "SmokeSeal" or approved equal) may be used in lieu of the sealant on foam rod in noise sensitive walls that are also fire rated.

2.6 FOAM BACKER ROD

- A. Closed cell polyethylene backer rod, ASTM C1193
- B. Acceptable Manufacturers: ITP, Nomaco, or approved equal (available through Tom Brown, Inc. 800-446-2298)

2.7 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.8 Expansion Joint Filler: W.R. Meadows, Sealtight, multi-purpose expansion-contraction joint filler in recommended thickness for anticipated range of joint movement. Adhere to one plane surface.

2.9 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.10 ADHESIVES

- A. Material recommended by adhesive manufacturer for application of material to substrate for intended application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

- a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Other porous substrates.
3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Porcelain enamel.
 - b. Glazed surfaces of ceramic tile.
 - c. Other porous substrates.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Sealants for Stone Masonry: Provide non-staining sealant systems as certified by test data and as recommended by manufacturer for sealing interior and exterior stone facing joints.
- D. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
1. Furnish and install acoustical sealant at the following locations:
 - a. All penetrations of partition, wall, and floor construction by ductwork, conduit, piping, or structure
 - b. All termination of partitions enclosing Noise Critical Spaces to abutting construction (e.g. partitions, structure, etc.)
 - c. Both sides of door frames to abutting construction where doors are scheduled to have acoustical seals
 - d. Both sides of window frames to adjacent construction at windows in partitions enclosing Noise Critical Spaces.
 - e. Perimeter of penetrations through sound isolating ceilings, roof systems, and floor systems
 2. Backer Rod shall be used in all joints greater than ¼ inch. Product to be constructed of closed cell foam, or appropriate resilient material for sealant. Dimension shall be minimum 30% greater than joint width, unless otherwise indicated on details.

- E. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

- F. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

- G. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- H. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - 4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

- I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
 - 1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
 - 2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
 - 3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
 - 4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

- J. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient

temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

1. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
2. Inspect tested joints and report on the following:
 - a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - b. Whether sealants filled joint cavities and are free of voids.
 - c. Whether sealant dimensions and configurations comply with specified requirements.
3. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
4. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

- B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 Sealant Schedule:

LOCATION	SYSTEM NO.	CUSTOM COLOR
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**Victory Villa Elementary School
Replacement School
PSCP #03.057.17 LP
ARA-209-17**

Masonry/Masonry	ES-1	Yes
Masonry/Metal	ES-1	Yes
Metal/Metal	ES-1	Yes
Tile/Fixtures	ES-4	Yes
Painter's Caulk	LS	No
Interior Acoustical Joints	AS	No
Exterior Paving – See Division 32		

END OF SECTION 07 92 00

SECTION 07 95 00 - EXPANSION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Interior expansion control systems.
- 2. Exterior wall expansion control systems.

- B. Related Requirements:

- 1. Division 07 Section "Manufactured Roof Expansion Joints" for factory-fabricated roof expansion control.
- 2. Division 07 Section "Fire-Resistive Joint Systems" for liquid-applied joint sealants in fire-resistive building joints.
- 3. Division 07 Section "Joint Sealants" for liquid-applied joint sealants and for elastomeric sealants without metal frames.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: For each expansion control system specified. Include plans, elevations, sections, details, splices, blockout requirement, attachments to other work, and line diagrams showing entire route of each expansion control system. Where expansion control systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
- B. Samples: For each exposed expansion control system and for each color and texture specified, full width by 6 inches (150 mm) long in size.
- C. Samples for Initial Selection: For each type of expansion control system indicated.
 - 1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.
- D. Samples for Verification: For each type of expansion control system indicated, full width by 6 inches (150 mm) long in size.
- E. Product Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
 - 1. Manufacturer and model number for each expansion control system.

2. Expansion control system location cross-referenced to Drawings.
3. Nominal joint width.
4. Movement capability.
5. Classification as thermal or seismic.
6. Materials, colors, and finishes.
7. Product options.
8. Fire-resistance ratings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each fire barrier provided as part of an expansion control system, for tests performed by a qualified testing agency.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. General: Provide expansion control systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
 1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where expansion control systems change direction or abut other materials.
 2. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion control systems.
- B. Coordination: Coordinate installation of exterior wall[and soffit] expansion control systems with roof expansion control systems to ensure that wall transitions are watertight. Roof expansion joint assemblies are specified in Division 07 Sections.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Where indicated, provide expansion control systems with fire barriers identical to those of systems tested for fire resistance per UL 2079 or ASTM E 1966 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Seismic Performance: Expansion control systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."
 2. Component Importance Factor is [1.5] [1.0].

2.3 INTERIOR EXPANSION CONTROL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or a comparable product by one of the following:
 - 1. Architectural Art Mfg., Inc.; Division of Pittcon Industries.
 - 2. Balco, Inc.
 - 3. Construction Specialties, Inc.
 - 4. JointMaster/InPro Corporation.
 - 5. Michael Rizza Company, LLC.
 - 6. MM Systems Corporation.
 - 7. Nystrom, Inc.
 - 8. Watson Bowman Acme Corp.; a BASF Construction Chemicals business.
- C. Source Limitations: Obtain expansion control systems from single source from single manufacturer.
- D. Floor-to-Floor: Slab on Grade to Slab on Grade
 - 1. Basis-of-Design Product: Construction Specialties Reflex® (RFX) Fire Barrier for 1"-4" joints
 - 2. Design Criteria:
 - a. Nominal Joint Width: 1"
 - b. Movement Capability: ½".
 - c. Type of Movement: Thermal.
 - d. Load Capacity:
 - 1) Uniform Load: 150 lb/sq. ft.
 - 2) Concentrated Load: 2000 lb
 - 3) Maximum Deflection: [0.5 inch
 - e. Fire-Resistance Rating: Provide expansion control system and fire-barrier assembly with a rating not less than 2 hours.
 - 3. Type: Hidden sightline.
 - a. Cover-Plate Design: Abrasive filled.
 - 1) Cover-Plate Recess Depth: As required to accommodate adjacent flooring.
 - b. Metal: Stainless steel.
 - 1) Finish: No. 4.
- E. Wall-to-Wall :

1. Basis-of-Design Product: Construction Specialties GSF-100W.
 2. Design Criteria:
 - a. Nominal Joint Width: 1”
 - b. Movement Capability: ½”.
 - c. Type of Movement: Thermal.
 3. Type: GFS-W / GFSW-W is a gasketed wall joint cover comprised of extruded aluminum frames and a TPR seal. The extruded aluminum wall frame is designed to provide a minimal bump in a surface-mounted application..
 - a. Metal: Aluminum.
 - 1) Finish: Clear anodic, Class I
 - b. Seal Material: Manufacturer's standard.
 - 1) Color: As selected by Architect from manufacturer's full range.
- F. Ceiling-to-Ceiling:

2.4 MATERIALS

- A. Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063-T5 for extrusions; ASTM B 209 (ASTM B 209M), Alloy 6061-T6 for sheet and plate.
 1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
- B. Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 304 for plates, sheet, and strips.
 1. Remove tool and die marks and stretch lines or blend into finish.
- C. Elastomeric Seals: ASTM E 1783; preformed elastomeric membranes or extrusions to be installed in metal frames.
- D. Compression Seals: ASTM E 1612; preformed elastomeric extrusions having an internal baffle system and designed to function under compression.
- E. Cellular Foam Seals: Extruded, compressible foam designed to function under compression.
- F. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to meet performance criteria for required fire-resistance rating.
- G. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

- H. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

- A. Mill finish.
- B. Clear Anodic Finish: AAMA 611, or thicker.

2.7 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3. Directional Satin Finish: No. 4.
- C. Bright, Cold-Rolled, Unpolished Finish: No. 2B.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces where expansion control systems will be installed for installation tolerances and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to expansion control system manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion control systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion control systems.
- C. Cast-In Frames: Coordinate and furnish frames to be cast into concrete.

3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion control systems and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion control systems.
 - 1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
 - 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper expansion control system installation and performance.
 - 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
 - 4. Repair or grout blockout as required for continuous frame support using nonmetallic, shrinkage-resistant grout.
 - 5. Install frames in continuous contact with adjacent surfaces.
 - a. Shimming is not permitted.
 - 6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches (75 mm) from each end and not more than 24 inches (600 mm) o.c.
- C. Seals in Metal Frames: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
 - 1. Provide in continuous lengths for straight sections.
 - 2. Seal transitions according to manufacturer's written instructions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
 - 3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Compression Seals: Apply adhesive or lubricant adhesive as recommended by manufacturer to both frame interfaces and sides of slabs before installing compression seals.
- E. Foam Seals: Install with adhesive recommended by manufacturer.

- F. Epoxy-Bonded Seals: Pressurize seal for time period and to pressure recommended by manufacturer. Do not overpressurize.
- G. Terminate exposed ends of expansion control systems with field- or factory-fabricated termination devices.
- H. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion control system materials and associated work so complete assemblies comply with assembly performance requirements.
 - 1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

3.4 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion control systems. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION 07 95 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard Duty Full Flush Hollow Metal Doors
2. Standard Duty Full Flush Insulated Hollow Metal Doors
3. Standard Duty Hollow Metal Door Frames

B. Related Sections

1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Division 08 Section "Flush Wood Doors".
3. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
4. Division 08 Section "Door Hardware".
5. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ANSI/BHMA A156.15 - Hardware Preparation in Steel Doors and Frames.
10. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
11. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
12. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.

13. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
14. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
15. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
 1. Samples are only required by request of the architect and for manufactures that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL 10C.
 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 3. Smoke Control Door Assemblies: Comply with NFPA 105.

- a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
 - D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
 - E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
 - B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
 - C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.
- 1.6 PROJECT CONDITIONS
- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
- 1.7 COORDINATION
- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- 1.8 WARRANTY
- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CECO Door Products.
 2. Curries Company.
 3. Steelcraft.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- D. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. (96- to 192-kg/cu. m) density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
- B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Design: Flush panel.
 2. Core Construction: Manufacturer's standard polystyrene. Where indicated, provide doors fabricated as thermal-rated assemblies with a minimum R-value 1.66 or better.
 3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
 4. Vertical Edges: Vertical edges to have the face sheets spot welded and filled full height with an epoxy filler. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
 5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
4. Vertical Edges: Vertical edges to have the face sheets spot welded and filled full height with an epoxy filler. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

D. Manufacturers Basis of Design:

1. Curries Company 707 Series.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
1. Fabricate frames with mitered or coped corners.
 2. Fabricate frames, with the exception of knock down types, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.
 3. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 4. Manufacturers Basis of Design:
 - a. Curries Company M Series.
- C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners.
2. Fabricate frames, with the exception of slip-on drywall types, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.
3. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
4. Manufacturers Basis of Design:
 - a. Curries Company C Series (Drywall Profile).

- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

- E. Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal door manufacturer's written instructions.

2.7 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.8 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 - 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
- D. Hollow Metal Frames:
 - 1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
 - 3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
 - 5. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
 - 6. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 - 7. Jamb Anchors: Provide number and spacing of anchors as follows:

- a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

- b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

- 8. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
 - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 - 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
 - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 - 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.9 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08 11 13

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid core doors with wood veneer faces.
2. Factory finishing wood doors.
3. Factory fitting wood doors to frames and factory machining for hardware.
4. Louvers installed in flush wood doors.

B. Related Sections:

1. Division 08 Section "Hollow Metal Doors and Frames" for wood doors in steel frames.
2. Division 08 Section "Glazing" for glass view panels in wood doors.
3. Division 08 Section "Door Hardware" for door hardware for flush wood doors and wood frames.

C. Standards and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A208.1 – Wood Particleboard.
2. Intertek Testing Service (ITS Warnock Hersey) - Certification Listings for Fire Doors.
3. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
4. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
5. UL 10C - Positive Pressure Fire Tests of Door Assemblies; UL 1784 - Standard for Air Leakage Tests of Door Assemblies.
6. Window and Door Manufacturers Association - WDMA I.S.1-A Architectural Wood Flush Doors.

1.3 SUBMITTALS

- A. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, trim for openings, and WDMA I.S.1-A or AWS classifications. Include factory finishing specifications.

B. LEED Submittals:

1. Certificates for Credit MR 7: Chain-of-custody certificates certifying that flush wood doors comply with forest certification requirements.

- a. Include statement indicating costs for each certified wood product.
 2. Product Data for Credit EQ 4.4: For adhesives and composite wood products, documentation indicating that product contains no urea formaldehyde.
 - C. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the wood door supplier in order to prepare the doors and frames to receive the finish hardware items.
 - D. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
 1. Indicate dimensions and locations of mortises and holes for hardware.
 2. Indicate dimensions and locations of cutouts.
 3. Indicate requirements for veneer matching.
 4. Indicate doors to be factory finished and finish requirements.
 5. Indicate fire protection ratings for fire rated doors.
 - E. Samples for Initial Selection: For factory finished doors.
 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 2. Corner sections of doors, 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - a. Provide samples for each species of veneer and solid lumber required.
 - b. Finish veneer faced door samples with same materials proposed for factory finished doors.
 3. Frames for light openings, 6 inches long, for each material, type, and finish required.
 - F. Informational Submittals:
 1. Submit manufacturer's environmental documentation and applicable sustainability program credits that are available to contribute towards a LEED rated project certification.
 - G. Warranty: Sample of special warranties.
- 1.4 QUALITY ASSURANCE
- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer wherever possible.
 - B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, latest edition, "Industry Standard for Architectural Wood Flush Doors'.
 - C. Fire Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated,

based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL 10C (neutral pressure testing according to UL 10B where specified).

1. **Oversize Fire Rated Door Assemblies:** For units exceeding sizes of tested assemblies provide manufacturer's construction label, indicating compliance to independent 3rd party certification agency's procedure, except for size.
 2. **Temperature Rise Limit:** Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire test exposure.
 3. **Smoke Control Door Assemblies:** Comply with NFPA 105.
 - 1) **Smoke "S" Label:** Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
 4. **Blocking:** When through-bolts are not to be used, indicate size and location of blocking in 45, 60 and 90 minute mineral core doors.
- D. **Pre-Submittal Conference:** Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for receiving, handling, and installing flush wood doors.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package pre-finished doors individually in plastic bags or cardboard cartons and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

- A. **Environmental Limitations:** Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

- A. **Special Warranty:** Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in wood face veneers exceeding 0.01 inch in a 3-inch span.

- c. Telegraphing of core construction and delaminating of face in decorative laminate-faced doors.
2. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid Core Interior Doors: Life of installation according to manufacturer's written warranty.

PART 2 - PRODUCTS

2.1 DOOR CONSTRUCTION – GENERAL

- A. WDMA I.S.1-A Performance Grade: Extra Heavy Duty; Aesthetic Grade: Premium.
- B. Fire Rated Doors: Provide construction and core specified above as needed to provide fire ratings indicated.
 1. Category A Edge Construction: Provide 45, 60 and 90 minute fire rated doors edge construction with intumescent seals concealed by outer stile (Category A). Comply with specified requirements for exposed edges.
 2. Pairs: Provide fire retardant stiles that are listed and labeled for applications indicated without formed steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
 - a. Where required or specified, provide formed steel edges and astragals with intumescent seals. Finish steel edges and astragals with baked enamel.

2.2 CORE CONSTRUCTION

- A. Particleboard Core Doors:
 1. Particleboard: Wood fiber based materials complying with ANSI A208.1 Particleboard standard. Grade LD-2.
 2. Adhesive: Fully bonded construction using Polyurethane (PUR) glue.
 3. Blocking: When through-bolted hardware is not used, provide wood blocking in particleboard core doors as follows:
 - a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
 - b. 5-inch (125-mm) mid-rail blocking, in doors indicated to have exit devices.
 - 1) Optional Cores for Blocking: Provide doors with either glued-wood-stave or structural-composite-lumber core instead of particleboard core for doors indicated to receive closers and exit devices.
 4. Basis of Design:
 - a. Graham: PC, PC5

2.3 VENEERED DOORS FOR TRANSPARENT FINISH

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Eggers Industries: Premium
 2. Graham: GPD
 3. Marshfield: Signature
- B. Interior Solid Core Doors:
1. Grade: Premium
 2. Faces: Veneer grades as noted below; veneer minimum 1/50-inch (0.5mm) thickness at moisture content of 12% or less.
 - a. Plain Sliced Select White Maple, A grade faces.
 3. Match between Veneer Leaves: Book match.
 4. Assembly of Veneer Leaves on Door Faces:
 - a. Running Match.
 5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
 6. Vertical Edges: Matching same species as faces. Wood or composite material, one piece, laminated, or veneered. Minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors.
 7. Horizontal Edges: Solid wood or structural composite material meeting the minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors
 8. Construction: Five plies. Stiles and rails are bonded to core, then entire unit sanded before applying face veneers.
 9. At doors over 40% of the face cut-out for lights and or louvers, furnish engineered composite lumber core.

2.4 LOUVERS

- A. Metal Louvers: Door manufacturer's standard metal louvers unless otherwise indicated.
1. Blade Type: Vision proof inverted V or inverted Y.
 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish.

2.5 LIGHT FRAMES AND GLAZING

- A. Metal Frames for Light Openings in Fire Rated Doors over 20-minute rating: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated.

- B. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with the flush wood door manufacturer's written instructions.

2.6 FABRICATION

- A. Factory fit doors to suit frame opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 - 1. Comply with requirements in NFPA 80 for fire rated doors.
- B. Factory machine doors for hardware that is not surface applied. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - 2. Metal Astragals: Factory machine astragals and formed steel edges for hardware for pairs of fire rated doors.
- C. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
- D. Openings: Cut and trim openings through doors in factory.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Glazing: Comply with applicable requirements in Division 08 Section "Glazing."
 - 3. Louvers: Factory install louvers in prepared openings.
- E. Electrical Raceways: Provide flush wood doors receiving electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through wire transfer hardware or wiring harness specified in hardware sets in Division 08 "Door Hardware". Wire nut connections are not acceptable.

2.7 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Transparent Finish: Provide a clear protective coating over the wood veneer allowing the natural color and grain of the selected wood species to provide the appearance specified. Stain is applied to the wood surface underneath the transparent finish to add color and design flexibility.
 - 1. Grade: Premium.
 - 2. Finish: Meet or exceed WDMA I.S. 1A TR6 Catalyzed Polyurethane finish performance requirements.
 - 3. Staining: As selected by Architect from manufacturer's full range.
 - 4. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire rated doors in corresponding fire rated frames according to NFPA 80.
- C. Factory Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

SECTION 08 31 13 - ACCESS DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide access doors where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Section Includes:
 - 1. Access doors for installation in gypsum board.
- C. Related Documents/Sections: Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:
 - 1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
 - 2. Division 9 Section - Gypsum Board Assemblies: Gypsum board and steel framing.
 - 3. Division 9 Section - Painting: Field painting.

1.2 SUBMITTALS

- A. Identify proposed changes, differences, and discrepancies, including verbiage, terms, and definitions between Contract Documents and submittals.
- B. Product Data: For each type of product indicated, submit manufacturer's specifications and other data needed to prove compliance with the specified requirements. Include full technical data.
 - 1. Include complete schedule, including types, general locations, sizes, wall and ceiling construction details, finishes, latching or locking provisions, and other data pertinent to installation.
- C. Shop Drawings: Submit drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
 - 1. Templates and Diagrams: Furnish installation templates, diagrams, and other data to fabricators and installers of related work as necessary for coordination of the installation.
- D. Quality Control Submittals:
 - 1. Certificates:
 - a. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 2. Manufacturer's Instructions:
 - a. Submit manufacturer's recommended installation procedures which, when reviewing by the Architect, may become the basis for accepting or rejecting actual installation procedures used on the work.

E. Contract Closeout Submittals:

1. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Architect requisite copies of the following:
 - a. Project Record Documents.
 - b. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Quality Assurance:

1. Obtain access doors for entire project from one source from a single manufacturer.
2. Fire-Resistance Ratings: Provide UL listed access doors for rating shown.

B. Coordination: Furnish inserts and anchoring devices that must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.

1.4 PROJECT CONDITIONS

A. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment, and indicate on submittal schedule.

B. Special-Size Access Doors: Use where required or requested; indicate on schedule.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide access doors by one of the following:

1. J.L. Industries.
2. Karp Associates, Inc.
3. Milcor, Inc.
4. Nystrom, Inc.

2.2 ACCESS DOORS MATERIALS AND FABRICATION

A. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts, and ready for installation.

B. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.

C. Frames: Fabricate from 16-gage steel.

1. Furnish perforated frames with gypsum board bead.

D. Flush Panel Doors: Fabricate from not less than 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees. Finish with manufacturer's factory-applied prime paint.

1. For fire-rated units, provide manufacturer's standard insulated flush panel/doors, with continuous piano hinge and self-closing mechanism.
- E. Locking Devices: Furnish number required to hold door in flush, smooth plane when closed.
1. Provide cylinder lock, furnish 2 keys per lock and key all locks alike, tying into UMB master keying system.
- F. Fire Rated Access Doors: All access doors in rated shafts or fire rated wall types shall be: UL Listed for fire rating required.

PART3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's instructions for installation of access doors.
- B. Coordinate installation with work of other trades.

3.2 ADJUST AND CLEAN

- A. Adjust hardware and panels after installation for proper operation.
- B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

END OF SECTION 08 31 13

SECTION 08 33 22 - OVERHEAD COILING SERVICE DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Insulated service doors.
- B. Related Section:
 - 1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.
 - 1. Wind Loads: Uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa), acting inward and outward.
- B. Windborne-Debris-Impact-Resistance Performance: Provide impact-protective overhead coiling doors that pass missile-impact and cyclic-pressure tests when tested according to ASTM E 1886 and ASTM E 1996.
 - 1. Large Missile Test: For overhead coiling doors located within 30 feet (9.144 m) of grade.
 - 2. Small Missile Test: For overhead coiling doors located more than 30 feet (9.144 m) above grade.
- C. Seismic Performance: Overhead coiling doors shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Show locations of replaceable fusible links.
 - 3. Wiring Diagrams: For power, signal, and control wiring.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For overhead coiling doors, accessories, and components, from manufacturer.
- B. Oversize Construction Certification: For door assemblies required to be fire-rated and that exceed size limitations of labeled assemblies.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 - PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within slat faces.
 - 2. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face.
- B. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick; fabricated from metal to match curtain slats and finish.
- C. Bottom Bar for Counter Doors: Manufacturer's standard continuous channel or tubular shape, fabricated from metal to match curtain slats and finish.
- D. Astragal for Interior Doors: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- E. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.
 - 1. Removable Posts and Jamb Guides for Counter Doors: Manufacturer's standard.

2.2 HOOD

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.
 - 2. Exterior-Mounted Doors: Fabricate hood to act as weather protection and with a perimeter sealant-joint-bead profile for applying joint sealant.

2.3 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.
- B. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: Provide cylinders specified in Section 087100 "Door Hardware" and keyed to building keying system.
 - 2. Keys: Provide three for each cylinder.
- C. Chain Lock Keeper: Suitable for padlock.
- D. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.4 CURTAIN ACCESSORIES

- A. Weatherseals: Equip each exterior door with weather-stripping gaskets fitted to entire perimeter of door for a weathertight installation, unless otherwise indicated.
- B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door. Provide pull-down straps or pole hooks for doors more than 84 inches (2130 mm) high.

2.5 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.6 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door [and operation-cycles requirement] specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
1. Comply with NFPA 70.
 2. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24 V, ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.
- C. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 110513 "Common Motor Requirements for Equipment" unless otherwise indicated.
1. Electrical Characteristics:
 - a. Phase: Polyphase.
 - b. Volts: 460 V.
 - c. Hertz: 60.
 2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
 3. Motor Size: Minimum size large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
 4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
- D. Obstruction Detection Device: Equip motorized door with indicated external automatic safety sensor capable of protecting full width of door opening.
1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction. Provide self-monitoring capability designed to interface with door operator control circuit to detect damage to or disconnection of sensing device.
 2. Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable. Provide self-monitoring capability designed to interface with door operator control circuit to detect damage to or disconnection of sensing device.
- E. Remote-Control Station: Momentary-contact, three-button control station with push-button controls labeled "Open," "Close," and "Stop."
1. Interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
 2. Exterior units, full-guarded, standard-duty, surface-mounted, weatherproof type, NEMA ICS 6, Type 4 enclosure, key operated.

- F. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).
- G. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- H. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- I. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.
- J. Radio-Control System: Consisting of three-channel universal coaxial receiver to open, close, and stop door; one.

2.7 DOOR ASSEMBLY

- A. Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACME Rolling Doors.
 - b. Alpine Overhead Doors, Inc.
 - c. AlumaTek, Inc.
 - d. C.H.I. Overhead Doors.
 - e. City-Gates.
 - f. Cookson Company.
 - g. Cornell Iron Works, Inc.
 - h. Dynamic Closures Corp.
 - i. Lawrence Roll-Up Doors, Inc.
 - j. Mahon Door Corporation.
 - k. McKeon Rolling Steel Door Company, Inc.
 - l. Metro Door.
 - m. Overhead Door Corporation.
 - n. QMI Security Solutions.
 - o. Raynor.
 - p. Southwestern Steel Rolling Door Co.
 - q. Wayne-Dalton Corp.
 - r. Windsor Door.
- B. Operation Cycles: Not less than 20,000.
- C. Curtain R-Value: 8.
- D. Door Curtain Material: Aluminum.
- E. Door Size: as shown on the drawings.

- F. Door Curtain Slats: Flat profile slats of 3-1/4-inch (83-mm) center-to-center height.
- G. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
- H. Hood: Match curtain material and finish Aluminum.
 - 1. Shape: Round.
 - 2. Mounting: Face of INTERIOR wall.
- I. Integral Frame, Hood, and Fascia for Counter Door: Galvanized steel.
 - 1. Mounting: Between jambs. As shown on Drawings.
- J. Sill Configuration: Steel plate sill.
- K. Locking Devices: Equip door with locking device assembly and chain lock keeper.
 - 1. Locking Device Assembly: Cremone type, both jamb sides locking bars, operable from inside and outside with cylinders.
- L. Electric Door Operator:
 - 1. Usage Classification: Standard duty, up to 60 cycles per hour.
 - 2. Motor Exposure: Interior.
 - 3. Emergency Manual Operation: Chain type.
 - 4. Obstruction-Detection Device: Automatic photoelectric sensor.
 - 5. Remote-Control Station: Exterior.
- M. Door Finish:
 - 1. Powder-Coated Finish: Color matching Architect's sample satin finish.
 - 2. Factory Prime Finish: Manufacturer's standard color.
 - 3. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Fire-Rated Doors: Install according to NFPA 80.
- C. Smoke-Control Doors: Install according to NFPA 80 and NFPA 105.
- D. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by manufacturer. [Adjust seals to provide weathertight fit around entire perimeter.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 08 33 23

SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Exterior and interior storefront framing.
2. Exterior and interior manual-swing entrance doors.
3. Insulated aluminum spandrel panels.
4. Awning Vents (Add Alternate #10)..

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

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

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. LEED Submittals:

1. Product Data for Credit IEQ 4.1: For glazing sealants used inside the weatherproofing system, documentation including printed statement of VOC content.
2. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
 - a. Aluminum extrusions that contain at least 60% post-industrial recycled content
3. Regional Materials MR Credit 5.1: Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.

- 1.

- C. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
 - 2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
 - 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- D. Samples for Initial Selection: For units with factory-applied color finishes.
- E. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- F. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.
 - 1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.
- C. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. 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, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
 - 1. Fixed Framing and Glass Area:

- a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
2. Entrance Doors:
 - a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
 - b. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
- C. Energy Performance: Certify and label energy performance according to NFRC as follows:
 1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.38 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.39 as determined according to NFRC 200.
 3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 15 as determined according to NFRC 500.
- D. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
 2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Kawneer Company, Inc.
 2. YKK AP America Inc.
 3. Oldcastle Building Envelope.
 4. EFCO Corporation.
- B. Manufacturers Approved Proprietary Product Systems:
 1. Kawneer Aluminum Storefront System
 - a. Series: Trifab VG 451T Storefront System®
 - b. Size: 2": x 4 1/2".
 - c. Doors: Kawneer medium stile with 10" bottom rail
 2. YKK Aluminum Storefront System
 - a. Series: YES 45FT Storefront System®
 - b. Size: 2": x 4 1/2".
 - c. Doors: YKK 35D medium stile with 10" bottom rail
 3. Oldcastle Storefront System
 - a. Series: FG 3000 Multiplane Storefront System®
 - b. Size: 2": x 4 1/2".

- c. Doors: Oldcastle medium stile with 10" bottom rail
 - 4. EFCO Corporation
 - a. Series: 403 Storefront System®
 - b. Size: 2" x 4 1/2".
 - c. Doors: EFCO medium stile with 10" bottom rail
- C. Manufacturers Approved Proprietary Product Systems (Awning Vents):
 - 1. Kawneer Aluminum Storefront System
 - a. Series: GLASSvent UT®
 - 2. YKK Aluminum Storefront System
 - a. Series: Equal
 - 3. Oldcastle Storefront System
 - a. Series: Equal
 - 4. EFCO Corporation
 - a. Series: Equal
- D. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.3 FRAMING

- A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Construction: Thermally broken exterior, non-thermal interior.
 - 2. Glazing System: Retained mechanically with gaskets on four sides.
 - 3. Glazing Plane: Center.
 - 4. Finish: High-performance organic finish.
 - 5. Fabrication Method: Field-fabricated stick system.
- B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Insulated aluminum spandrel panels.
- E. Materials:
 - 1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

- a. Sheet and Plate: ASTM B 209.
- b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
- c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
- d. Structural Profiles: ASTM B 308/B 308M.

2.4 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 2. Door Design: Medium stile; 3-1/2-inch nominal width.
 3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.

2.5 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."
- B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door to comply with requirements in this Section.
1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
 3. Opening-Force Requirements:
 - a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
 - b. Accessible Interior Doors: Not more than 5 lbf to fully open door.
- C. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:
1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in "Entrance Door Hardware Sets" Article.
 2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.
- D. Continuous-Gear Hinges: Manufacturer's standard with stainless-steel bearings between knuckles, fabricated to full height of door and frame.
- E. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.

- F. Manual Flush Bolts: BHMA A156.16, Grade 1.
 - G. Panic Exit Devices: BHMA A156.3, Grade 1, listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
 - H. Cylinders: As specified in Section 087100 "Door Hardware.
 - I. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
 - J. Operating Trim: BHMA A156.6.
 - K. Removable Mullions: BHMA A156.3, extruded aluminum.
 - 1. When used with panic exit devices, provide removable mullions listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305. Use only mullions that have been tested with exit devices to be used.
 - L. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to comply with field conditions and requirements for opening force.
 - M. Concealed Overhead Holders: BHMA A156.8, Grade 1.
 - N. Surface-Mounted Holders: BHMA A156.16, Grade 1.
 - O. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.
 - P. Weather Stripping: Manufacturer's standard replaceable components.
 - 1. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.
 - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
 - Q. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.
 - R. Silencers: BHMA A156.16, Grade 1.
 - S. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch
- 2.6 AWNING VENT WINDOWS (ADD ALTERNATE)
- A. Product: Kawneer GLASSvent™ UT Windows (Structural Silicone Glazed)
 - a. Project-Out and Outswing Casement Windows

b. 4-3/8" (111.1 mm); 5-1/8" (130.2 mm) Overall System Depth

c. AW-PG90-AP/AW-PG90-C

- B. Project-Out: U-Factor not more than .56 BTU/hr/ft²/°F per AAMA 1503 with exterior 1/4" clear glass, Solarban 70 XL Low E Sputtered Coating on #2 surface, argon filled air space , and interior 1/4" glass.

2.7 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.8 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 2. Reinforce members as required to receive fastener threads.
 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.9 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.
 2. Accurately fitted joints with ends coped or mitered.
 3. Physical and thermal isolation of glazing from framing members.

4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 5. Provisions for field replacement of glazing.
 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- C. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- D. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
1. At exterior doors, provide compression weather stripping at fixed stops.
 2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.
- E. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 2. At exterior doors, provide weather sweeps applied to door bottoms.
- F. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.10 ALUMINUM FINISHES

- A. Anodic Finish: Clear Anodic Finish: AAMA 611, [AA-M12C22A42/A44, Class I, 0.018 mm AA-M12C22A32/A34 or thicker.
1. Color: Kawneer Clear Anodic Finish Aluminum Association Specification AA-M10C22A44, Architectural Class I (.7 mils minimum).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, 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.

3.2 INSTALLATION

- A. General:

1. Comply with manufacturer's written instructions.
 2. Do not install damaged components.
 3. Fit joints to produce hairline joints free of burrs and distortion.
 4. Rigidly secure nonmovement joints.
 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 6. Seal perimeter and other joints watertight unless otherwise indicated.
- B. Metal Protection:
1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- F. Install glazing as specified in Section 088000 "Glazing."
- G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.3 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet
 3. Alignment: limit offset from true alignment to 1/16 inch.
 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.4 MAINTENANCE SERVICE

- A. Entrance Door Hardware:
1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

2. Initial Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of entrance door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity. Use parts and supplies that are the same as those used in the manufacture and installation of original equipment.

END OF SECTION 084113

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

- B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

- C. Related Sections:

1. Division 06 Section "Rough Carpentry".
2. Division 08 Section "Hollow Metal Doors and Frames".
3. Division 08 Section "Flush Wood Doors".
4. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
5. Division 28 Section "Access Control".

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

- E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

- C. Shop Drawings: Details of electrified access control hardware indicating the following:
 - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
 - b. Complete (risers, point-to-point) access control system block wiring diagrams.
 - c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.

- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures

- H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Five years for exit hardware.
 - 3. Twenty five years for manual surface door closer bodies.
 - 4. Two years for electromechanical door hardware.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
- C. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Acceptable Manufacturers:

- a. Hager Companies (HA).
- b. McKinney Products (MK).
- c. Stanley Hardware (ST).

- B. Pivots: ANSI/BHMA A156.4, Grade 1, certified. Space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL listed for windstorm where applicable.

1. Acceptable Manufacturers:

- a. Ives (IV).
- b. Rixson Door Controls (RF).

2.3 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Acceptable Manufacturers:

- a. Hager Companies (HA) - ETW-QC (# wires) Option.
- b. McKinney Products (MK) - QC (# wires) Option.
- c. Stanley Hardware (ST) – C Option.

- B. Electrified Quick Connect Intermediate Transfer Pivots: Provide electrified offset intermediate transfer pivot hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Acceptable Manufacturers:

- a. Rixson Door Controls (RF) - E-M19-QC (# wires).

- C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
 - a. McKinney Products (MK) - Electrical Connecting Kit: QC-R001.
 - b. McKinney Products (MK) - Connector Hand Tool: QC-R003.
 2. Acceptable Manufacturers:
 - a. McKinney Products (MK) – QC-C Series.
 - b. Stanley Hardware (ST) – WH Series.
- D. Provide mortar guard enclosure on steel frames installed at masonry openings for each electrical hinge specified.

2.4 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 2. Furnish dust proof strikes for bottom bolts.
 3. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 4. Acceptable Manufacturers:
 - a. Door Controls International (DC).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).
- B. Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 3. Acceptable Manufacturers:
 - a. Ives (IV).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).

2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

- B. Exterior Cylinders: Medeco Keymark X4 seven pin small format interchangeable core (SFIC) grandmasterkeyed or masterkeyed to the owners key system. Cylinders shall be purchased from Easters Lock and access systems (410) 825-3535.
- C. Interior Cylinder Cores: Seven pin small format interchangeable core (SFIC) grandmasterkeyed or masterkeyed to a new key system.
 - 1. Acceptable Manufacturers:
 - a. Best (BE).
 - b. Sargent Manufacturing (SA).
 - c. Schlage (SC).
- D. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 4. Keyway: To Meet Owners Requirements.
- E. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
 - 1. Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- F. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. New System: Key locks to a new key system as directed by the Owner.
- G. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Three (3) each.
 - 2. Master Keys per Master Key Level/Group: Five (5) each.
 - 3. Construction Keys: Ten (10) each.
 - 4. Construction Control Keys: Two (2) each.
 - 5. Permanent Control Keys: Two (2) each.
- H. Construction Keying: Provide temporary brass keyed construction cores.
- I. Key Registration List (Bitting List):
 - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 - 2. Provide transcript list in writing or electronic file as directed by the Owner.

- J. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Acceptable Manufacturers:

- a. Lund Equipment (LU).
- b. MMF Industries (MM).
- c. Telkee (TK).

- K. Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Acceptable Manufacturers:

- a. Arrow (AR) - BM Series.
- b. Corbin Russwin Hardware (RU) – ML2000 Series.
- c. Sargent Manufacturing (SA) – 8200 Series.

2.7 ELECTROMECHANICAL LOCKING DEVICES

- A. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below.

1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, deadbolt monitoring, and request-to-exit signaling. Support end-of-line resistors contained within the lock case. Unless otherwise indicated, provide electrified locksets standard as fail secure.
2. Acceptable Manufacturers:

- a. Arrow (AR) - BM Series.
- b. Corbin Russwin Hardware (RU) - ML20900 Series.
- c. Sargent Manufacturing (SA) - 8200 Series.

2.8 AUXILIARY LOCKS

- A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.5, Grade 1, certified small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.
1. Acceptable Manufacturers:
 - a. Arrow Locks (AW) – N Series.
 - b. Corbin Russwin Hardware (RU) - DL4100 Series.
 - c. Sargent Manufacturing (SA) - 4870 Series.

2.9 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 3. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.
 6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 8. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 9. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
 - c. Von Duprin (VD) – 98XP Series.
- C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.
1. Provide keyed removable feature where specified in the Hardware Sets.
 2. Provide stabilizers and mounting brackets as required.
 3. Provide electrical quick connection wiring options as specified in the hardware sets.
 4. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - 900 Series.
 - b. Sargent Manufacturing (SA) - 980S Series.
 - c. Von Duprin (VD) - 9954 Series.

2.11 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt and security type fasteners as required for proper installation.
- B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC6000 Series.
 - b. LCN Closers (LC) - 4040 Series.
 - c. Sargent Manufacturing (SA) - 281 Series.
- C. Door Closers, Surface Mounted (Cam Action): ANSI/BHMA 156.4, Grade 1 certified surface mounted, high efficiency door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be of the cam and roller design, one piece cast aluminum silicon alloy body with adjustable backcheck and independently controlled valves for closing sweep and latch speed.
1. Acceptable Manufacturers:
 - a. Corbin Russwin (RU) - DC5000 Series.
 - b. Sargent Manufacturing (SA) - 421 Series.

2.12 SURFACE MOUNTED CLOSER HOLDERS

- A. Single Point Closer Holders: Single point closer holder designed to hold open fire or smoke rated doors until interruption of signal from fire alarm, smoke detector or remote release switch. Pull side, push side, or double egress mounting applications available with non-handed track and closer body and dual voltage input (24V/120V). Voltage to be 24VDC unless otherwise specified. Pull side mounted closers to have minimum adjustable hold-open range of 85 to 110 degrees. Auxiliary door stops are required at hold open point.
1. Acceptable Manufacturers:
 - a. LCN Door Closers (LC) - 4040SE Series.
 - b. Sargent Manufacturing (SA) - 351 Series.
 - c. Corbin Russwin (RU) DC62900 Series.

 - B. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate 12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.
1. Acceptable Manufacturers:
 - a. Rixson (RF) - 990 Series.
 - b. Sargent Manufacturing (SA) - 1560 Series.

2.13 ARCHITECTURAL TRIM

- A. Door Protective Trim
1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 3. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
 4. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
 5. Acceptable Manufacturers:
 - a. Ives (IV).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TR).

2.14 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 - 1. Acceptable Manufacturers:
 - a. Door Controls International (DC).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).

- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 - 1. Acceptable Manufacturers:
 - a. Rixson Door Controls (RF).
 - b. Rockwood Manufacturing (RO).
 - c. Sargent Manufacturing (SA).

2.15 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.

- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Acceptable Manufacturers:
 - 1. National Guard Products (NG).
 - 2. Pemko Manufacturing (PE).

2.16 ELECTRONIC ACCESSORIES

- A. Key Switches: Key switches furnished standard with stainless steel single gang face plate with a 12/24VDC bi-color LED indicator. Integral backing bracket permits integration with any 1 1/4" or 1 1/2" mortise type cylinder. Key switches available as momentary or maintained action and in narrow face plate options.
 - 1. Acceptable Manufacturers:
 - a. Securitron (SU) - MK Series.
- B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
 - 1. Acceptable Manufacturers:
 - a. Sargent Manufacturing (SA) – 3280 Series.
 - b. Securitron (SU) - DPS Series.
- C. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) – 782.
 - b. Sargent Manufacturing (SA) – 3500 Series.
 - c. Von Duprin (VD) - PS.
- D. Switching Power Supplies: Provide UL listed or recognized filtered and regulated power supplies. Provide single, dual, or multi-voltage units as shown in the hardware sets. Units must be expandable up to eight Class 2 power limited outputs. Units must include the capability to incorporate a battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Acceptable Manufacturers:
 - a. Securitron (SU) - AQ Series.

2.17 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.18 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.

- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

Set: 1 – Exterior Entry

Doors: 000-A

2 Pivot (Set)	147	626	RF
2 Intermediate Pivot	M19	626	RF
2 Exit Device	ED5200 x VT950 x less cylinder x M51 x M110 x M54	630	RU
1 Removable Mullion	910KM x 120" x less cylinder		RU
	<i>(Removable mullion to be cut to size in the field)</i>		
1 Mortise Cylinder		US26D	MC
2 Closer/Holder	DC6210 A12 x M77	689	RU
2 Mounting Bracket	597F58	689	RU
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
	<i>(Threshold to be notched for removable mullion in the field)</i>		
1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE
2 Door Position Switch	DPS-M-BK		SU

Gasketing furnished by frame manufacturer

Set: 1.1 – Exterior Entry

Doors: 000-B

2	Pivot (Set)	147	626	RF
1	Intermediate Pivot	M19	626	RF
1	Electric Intermediate Pivot <i>(For active leaf of pair only)</i>	E-M19 x QC-12	626	RF
1	ElectroLynx Harness <i>(Install between electric intermediate pivot and junction box)</i>	QC-C1500P		MK
1	Electric Latch Retraction Exit Device <i>(Fail Secure)</i>	ED5200 x VT957 x less cylinder x MELR x M51 x M54 x M110 x 24VDC	630	RU
1	ElectroLynx Harness <i>(Install between electric intermediate pivot and electric latch retraction exit device)</i>	QC-CXXX x required length		MK
1	Rim Cylinder		US26D	MC
1	Exit Device	ED5200 x VT950 x less cylinder x M51 x M110 x M54	630	RU
1	Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x less cylinder		RU
1	Mortise Cylinder		US26D	MC
2	Closer/Holder	DC6210 A12 x M54	689	RU
2	Mounting Bracket	597F58	689	RU
1	Threshold <i>(Threshold to be notched for removable mullion in the field)</i>	272 A x 1842 AS x DOW x MS & ES25		PE
1	Mullion Door Seal	5110 BL x DOH		PE
2	Door Bottom Seal	321 CN x DOW		PE
1	Drip Strip	346 C x DOW + 4"		PE
1	Card Reader	Furnished and installed by security contractor		00
1	Aiphone System	Furnished and installed by security contractor		00
2	Door Position Switch	DPS-M-BK		SU
1	Controller	782		RU
1	Wiring Diagram	WD-SYSPK		RU
1	Knox Box <i>(Locate per the architects/owners instructions)</i>	3200 x recessed mount x RMK		00

Gasketing furnished by frame manufacturer

Card reader to be used by authorized persons to gain entry from the exterior side of the opening

Card reader to be used to retract the latch of the electric latch retraction exit device

Latch of the electric latch retraction exit device to be retracted from a remote location

Push bar of exit devices always free for immediate egress

Set: 1.2 – Entry Vestibule

Doors: 001-D

2 Pivot (Set)	147	626	RF
1 Intermediate Pivot	M19	626	RF
1 Electric Intermediate Pivot <i>(For active leaf of pair only)</i>	E-M19 x QC-12	626	RF
1 ElectroLynx Harness <i>(Install between electric intermediate pivot and junction box)</i>	QC-C1500P		MK
1 Electric Latch Retraction Exit Device <i>(Fail Secure)</i>	ED5200 x VT957 x temporary core x MELR x M51 x M54 x M110 x CMK x 24VDC	630	RU
1 ElectroLynx Harness <i>(Install between electric intermediate pivot and electric latch retraction exit device)</i>	QC-CXXX x required length		MK
1 Exit Device	ED5200 x VT950 x M51 x M110 x M54	630	RU
1 Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x temporary core x CMK		RU
2 Permanent Core	1C Series x MK	626	BE
2 Closer/Holder	DC6210 A12 x M77	689	RU
2 Mounting Bracket	597F58	689	RU
1 Threshold <i>(Threshold to be notched for removable mullion in the field)</i>	170 A x DOW x MS & ES25		PE
1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Card Reader	Furnished and installed by security contractor		00
1 Door Position Switch	DPS-M-BK		SU
1 Controller	782		RU
1 Wiring Diagram	WD-SYSPK		RU

Gasketing furnished by frame manufacturer

Card reader to be used by authorized persons to gain entry from the vestibule side of the opening

Card reader to be used to retract the latch of the electric latch retraction exit device

Push bar of exit devices always free for immediate egress

Set: 1.3 – Entry Vestibule

Doors: 001-E

2 Pivot (Set)	147	626	RF
2 Intermediate Pivot	M19	626	RF
1 Exit Device	ED5200 x VT950 x M51 x M110 x M54	630	RU
1 Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x temporary core x CMK		RU
1 Permanent Core	1C Series x MK	626	BE
2 Closer/Holder	DC6210 A12 x M54	689	RU
2 Mounting Bracket	597F58	689	RU
1 Threshold	170 A x DOW x MS & ES25		PE

(Threshold to be notched for removable mullion in the field)

1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
2 Door Position Switch	DPS-M-BK		SU

Gasketing furnished by frame manufacturer

Set: 2 – Exterior Entry

Doors: 000A-B, 001A-B, 001C-A

2 Pivot (Set)	147	626	RF
1 Intermediate Pivot	M19	626	RF
1 Electric Intermediate Pivot	E-M19 x QC-12	626	RF
<i>(For active leaf of pair only)</i>			
1 ElectroLynx Harness	QC-C1500P		MK
<i>(Install between electric intermediate pivot and junction box)</i>			
1 Electric Latch Retraction Exit Device	ED5200 x VT957 x less cylinder x	630	RU
<i>(Fail Secure)</i>			
	MELR x M51 x M54 x M110 x		
	24VDC		
1 ElectroLynx Harness	QC-CXXX x required length		MK
<i>(Install between electric intermediate pivot and electric latch retraction exit device)</i>			
1 Rim Cylinder		US26D	MC
1 Exit Device	ED5200 x VT950 x less cylinder x	630	RU
	M51 x M110 x M54		
1 Removable Mullion	910KM x 120" x less cylinder		RU
<i>(Removable mullion to be cut to size in the field)</i>			
1 Mortise Cylinder		US26D	MC
2 Closer/Stop	DC6210 A11 x M54	689	RU
2 Mounting Plate	597F58	689	RU
1 Threshold	272 A x 1842 AS x DOW x MS &		PE
	ES25		
<i>(Threshold to be notched for removable mullion in the field)</i>			
1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE
1 Card Reader	Furnished and installed by security		00
	contractor		
2 Door Position Switch	DPS-M-BK		SU
1 Controller	782		RU
1 Wiring Diagram	WD-SYSPK		RU

Gasketing furnished by frame manufacturer

Card reader to be used by authorized persons to gain entry from the exterior side of the opening

Card reader to be used to retract the latch of the electric latch retraction exit device

Push bar of exit devices always free for immediate egress

Set: 2.1 – Entry Vestibule

Doors: 000A-A

2 Pivot (Set)	147	626	RF
2 Intermediate Pivot	M19	626	RF
2 Dummy Push Bar	ED5000DB x VT950 x M110	630	RU
2 Closer/Stop	DC6210 A11 x M54	689	RU
2 Mounting Plate	597F58	689	RU
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Astragal (Set)	(2) 297 AS x DOH		PE

Gasketing furnished by frame manufacturer

Set: 3 – Corridor

Doors: 001-B, 001-G

6 Hinge	T4A3786 5" x 4-1/2" NRP	US26D	MK
1 Exit Device	ED5470B x PR955 x temporary core x M55 x M110 x M54 x W048 x CMK	630	RU
1 Permanent Core	1C Series x MK	626	BE
1 Exit Device	ED5470B x M55 x M110 x M54 x W048	630	RU
2 Closer	DC6210 A3 x M54	689	RU
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Astragal (Set)	(2) 297 AS x DOH		PE
2 Electromechanical Holder	993 x 24VDC		RF
1 Key Switch	MKA x 24VDC		SU
1 Mortise Cylinder	1040-114-A02 x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE

Electromagnetic holders to be tied into the building fire alarm system

Key switch to be used to activate and deactivate the electromagnetic holders

Set: 4 – Waiting

Doors: 101-B

2 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Electric Hinge	T4A3786 4-1/2" x 4-1/2" QC-12	US26D	MK
	<i>(Install at middle hinge)</i>		
1 ElectroLynx Harness	QC-C1500P		MK
	<i>(Install between electric hinge and junction box)</i>		
1 Electrified Lockset (Fail Secure)	ML20906-SEC x PSA x temporary core x CMK	626	RU
1 ElectroLynx Harness	QC-CXXX x required length		MK
	<i>(Install between electric hinge and electrified lockset)</i>		

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1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200	689	RU
1 Door Stop	481	US26D	RO
1 Card Reader	Furnished and installed by security contractor		00
1 Door Position Switch	DPS-M-BK		SU
1 Power Supply	AQD3		SU
1 Wiring Diagram	WD-SYSPK		RU

Gasketing furnished by frame manufacturer
 Card reader to be used by authorized persons to gain entry from the corridor side of the opening
 Card reader to be used to unlock the corridor side lever of the electrified lockset
 Waiting side lever of the electrified lockset always free for immediate egress

Set: 5 – Corridor

Doors: 001-L

6 Hinge	T4A3786 5" x 4-1/2" NRP	US26D	MK
1 Exit Device	ED5470B x PR955 x temporary core x M55 x M110 x M54 x CMK	630	RU
1 Permanent Core	1C Series x MK	626	BE
1 Exit Device	ED5470B x M55 x M110 x M54	630	RU
2 Electromechanical Closer	DC62940 x ET x M54 x 24VDC	689	RU
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
2 Wall Stop	406	US32D	RO
2 Silencer	608		RO

Electromechanical closers to be tied into the building fire alarm system

Set: 5.1 – Corridor

Doors: 002-A, 002-B

6 Hinge	T4A3786 5" x 4-1/2" NRP	US26D	MK
1 Exit Device	ED5470 x PR955 x temporary core x M52 x M55 x M110 x M54 x CMK	630	RU
1 Exit Device	ED5470 x PR950 x temporary core x M52 x M55 x M110 x M54 x CMK	630	RU
3 Permanent Core	1C Series x MK	626	BE
2 Electromechanical Closer	DC62940 x ET x M54 x 24VDC	689	RU
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
2 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Astragal (Set)	(2) 297 AS x DOH		PE

Electromechanical closers to be tied into the building fire alarm system

Set: 6 – Gymnasium

Doors: 007-A

6 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
2 Exit Device	ED5200 x PR910 x temporary core x M52 x M110 x M54 x CMK	630	RU
1 Removable Mullion	910KM x 120" x temporary core x CMK		RU
<i>(Removable mullion to be cut to size in the field)</i>			
3 Permanent Core	1C Series x MK	626	BE
2 Closer	DC6210 A3 x M54	689	RU
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
2 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Mullion Door Seal	5110 BL x DOH		PE

Set: 7 – Gymnasium

Doors: 006-A

3 Hinge	T4A3786 5" x 5" NRP	US26D	MK
1 Security Classroom Exit Device	ED5202 x PR955 x temporary core x M52 x M110 x D200 x M54 x CMK	630	RU
3 Permanent Core	1C Series x MK	626	BE
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 8 – Exterior Corridor

Doors: 006-B

3 Hinge	T4A3386 4-1/2" x 4-1/2" NRP	US32D	MK
1 Exit Device	ED5200 x VT957 x less cylinder x M52 x M110 x M54	630	RU
1 Rim Cylinder		US26D	MC
1 Mortise Cylinder		US26D	MC
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Gasketing (Set)	316 AS x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 9 – Exterior Corridor

Doors: 005, 007B

5 Hinge	T4A3386 4-1/2" x 4-1/2" NRP	US32D	MK
1 Electric Hinge	T4A3386 4-1/2" x 4-1/2" QC-12	US32D	MK
<i>(Install at middle hinge-active leaf only)</i>			
1 ElectroLynx Harness	QC-C1500P		MK
<i>(Install between electric hinge and junction box)</i>			
1 Mortar Guard	MG-16	US2C	MK
1 Electric Latch Retraction Exit Device	ED5200 x VT957 x less cylinder x	630	RU
<i>(Fail Secure)</i>			
	MELR x M51 x M54 x M110 x		
	24VDC		
1 ElectroLynx Harness	QC-CXXX x required length		MK
<i>(Install between electric hinge and electric latch retraction exit device)</i>			
1 Rim Cylinder		US26D	MC
1 Exit Device	ED5200 x VT950 x less cylinder x	630	RU
	M51 x M110 x M54		
1 Removable Mullion	910KM x 120" x less cylinder		RU
<i>(Removable mullion to be cut to size in the field)</i>			
1 Mortise Cylinder		US26D	MC
2 Closer/Stop	DC6210 A11 x M54	689	RU
2 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS &		PE
	ES25		
<i>(Threshold to be notched for removable mullion in the field)</i>			
1 Gasketing (Set)	316 AS x DOW x DOH		PE
1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE
1 Card Reader	Furnished and installed by security contractor		00
2 Door Position Switch	DPS-M-BK		SU
1 Controller	782		RU
1 Wiring Diagram	WD-SYSPK		RU

Card reader to be used by authorized persons to gain entry from the exterior side of the opening
 Card reader to be used to retract the latch of the electric latch retraction exit device
 Push bar of exit devices always free for immediate egress

Set: 10 – Waiting

Doors: 101-A

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x	626	RU
	CMK		
1 Permanent Core	1C Series x MK	626	BE
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	171 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Door Bottom Seal	234 AV x DOW		PE

Set: 11 – Records

Doors: 101A

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200 x M54	689	RU
1 Door Stop	481	US26D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 12 – Office

Doors: 101B, 101C, 101D, 101F, 101G, 102-B, 102B

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
1 Door Stop	481	US26D	RO
<i>(For door 102-B only)</i>			
3 Silencer	608		RO

Set: 12.1 – Office

Doors: 103-A

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 12.2 – Office

Doors: 147B

3 Hinge	TA2714 4-1/2" x 4-1/2" NRP	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 13 – Conference Room/Exam

Doors: 101E, 102E

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Passage Set	ML2010 PSA	626	RU
1 Wall Stop	406	US32D	RO
1 Door Stop	481	US26D	RO
<i>(For door 101E only)</i>			
3 Silencer	608		RO

Set: 14 – Corridor/Staff Toilet

Doors: 101J, 101K, 136A, 136B, 142F, 234A, 234B

3 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Privacy Set	ML2060 PSA x M19V	626	RU
1 Closer	DC5230 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 15 – Coats/ELA

Doors: 101L, 127B-A, 127B-B, 130B-A, 130B-B, 133B, 201A-A, 201A-B, 204A-A, 204A-B, 206A-A, 207A-A, 207A-B, 210A-A, 210A-B, 212A-A, 212A-B, 216A-A, 216A-B, 219A-A, 219A-B, 221A-A, 221A-B, 223A-A, 223A-B, 226A-A

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Classroom Lockset	ML2055 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
<i>(For door 101L only)</i>			
1 Door Stop	481	US26D	RO
3 Silencer	608		RO

Set: 15.1

Not Used

Set: 16 – Administration/Corridor Office/Lounge

Doors: 101M-A, 106A, 136, 145, 146, 231

3 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO

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1 Door Stop <i>(For door 145 only)</i>	481	US26D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 16.1 – Administration/Workroom

Doors: 101M-B, 232

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer <i>(For door 101M-B only)</i>	DC6210 A3 x M54	689	RU
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop <i>(For door 101M-B only)</i>	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 16.2 – Corridor Office

Doors: 234

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 17 – Waiting

Doors: 102-A

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Classroom Lockset	ML2055 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC5230 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 18 – Toilet

Doors: 102A, 102F

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Privacy Set	ML2060 PSA x M19V	626	RU
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 18.1 – Toilet

Doors: 145A

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Privacy Set	ML2060 PSA x M19V	626	RU
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Overhead Stop	1-X36 x 90 deg	652	RF
3 Silencer	608		RO

Set: 19 – Exterior Corridor/Stair

Doors: 001A-A, ST2-B

2 Pivot (Set)	147	626	RF
2 Intermediate Pivot	M19	626	RF
1 Exit Device	ED5200 x VT957 x less cylinder x M52 x M110 x M54	630	RU
1 Rim Cylinder		US26D	MC
1 Exit Device	ED5200 x VT950 x less cylinder x M52 x M110 x M54	630	RU
1 Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x less cylinder		RU
3 Mortise Cylinder		US26D	MC
2 Closer/Stop	DC6210 A11 x M77 x M54	689	RU
2 Mounting Plate	597F58	689	RU
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
	<i>(Threshold to be notched for removable mullion in the field)</i>		
1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Gasketing furnished by frame manufacturer

Set: 20 – Exterior Stair

Doors: ST1-B

6 Hinge	T4A3386 4-1/2" x 4-1/2" NRP	US32D	MK
2 Exit Device	ED5200 x M51 x M110 x M54	630	RU
1 Removable Mullion	910KM x 120" x less cylinder <i>(Removable mullion to be cut to size in the field)</i>		RU
1 Mortise Cylinder		US26D	MC
2 Closer/Stop	DC6210 A11 x M54	689	RU
2 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS & ES25 <i>(Threshold to be notched for removable mullion in the field)</i>		PE
1 Gasketing (Set)	316 AS x DOW x DOH		PE
1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 21 – Stair

Doors: ST1-A, ST1-C, ST2-A

6 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
2 Exit Device	ED5470B x PR910 x M55 x M110 x M54	630	RU
2 Closer	DC6200 x M54	689	RU
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
2 Door Stop	481	US26D	RO
2 Silencer	608		RO
2 Electromagnetic Holder	993/9930 x 24VDC <i>(Furnish wall or floor mount as required)</i>	689	RF
1 Key Switch	MKA x 24VDC		SU
1 Mortise Cylinder	1040-114-A02 x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE

Electromagnetic holders to be tied into the building fire alarm system
 Key switch to be used to activate and deactivate the electromagnetic holders

Set: 22 – Storage

Doors: 102G, 120A

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
1 Door Stop	481	US26D	RO
<i>(For door 120A only)</i>			
3 Silencer	608		RO

Set: 22.1 – Storage

Doors: 106B

3 Hinge	TA2714 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 22.2 – Storage

Doors: 138A

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 22.3 – Storage

Doors: 214A

3 Hinge	T4A3786 5" x 5" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 23 – Stair

Doors: ST2-C

6 Hinge	T4A3386 4-1/2" x 4-1/2"	US32D	MK
2 Exit Device	ED5470B x PR910 x M55 x M110 x M54	630	RU
1 Closer <i>(For RHR leaf of pair only)</i>	DC5230 x M54	689	RU
1 Electromechanical Closer	DC62930 x 24VDC	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Door Stop <i>(For RHR leaf of pair only)</i>	481	US26D	RO
2 Silencer	608		RO
1 Electromagnetic Holder <i>(For RHR leaf of pair only)</i>	993 x 24VDC	689	RF
1 Key Switch	MKA x 24VDC		SU
1 Mortise Cylinder	1040-114-A02 x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE

Electromechanical closer and electromagnetic holder to be tied into the building fire alarm system
 Key switch to be used to activate and deactivate the electromagnetic holder

Set: 24 – Gymnasium/Platform

Doors: 140-A, 140-B, 141A-A

6 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Security Classroom Exit Device	ED5202 x PR955 x temporary core x M52 x M110 x M54 x CMK	630	RU
1 Exit Device	ED5200 x PR950 x temporary core x M52 x M110 x M54 x CMK	630	RU
1 Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x less cylinder		RU
5 Permanent Core	1C Series x MK	626	BE
2 Closer <i>(For door 141A-A only)</i>	DC6210 A3 x M54	689	RU
2 Closer/Stop	DC6210 A11 x M54	689	RU
2 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
2 Wall Stop <i>(For door 141A-A only)</i>	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Mullion Door Seal	5110 BL x DOH		PE

Set: 24.1 – Cafeteria/Library

Doors: 103-B, 141A, 141B

6 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Security Classroom Exit Device	ED5202 x PR955 x temporary core x M52 x M110 x M54 x CMK	630	RU
1 Exit Device	ED5200 x PR950 x temporary core x M52 x M110 x M54 x CMK	630	RU
1 Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x less cylinder		RU
5 Permanent Core	1C Series x MK	626	BE
2 Closer/Stop	DC6210 A11 x M77 x M54	689	RU
2 Mounting Bracket	597F58	689	RU
1 Mullion Door Seal	5110 BL x DOH		PE

Gasketing furnished by frame manufacturer

Set: 25 – Library

Doors: 103-C, 103-D

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Security Classroom Exit Device	ED5202 x PR955 x temporary core x M52 x M110 x M54 x CMK	630	RU
3 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6210 A3 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO

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1 Gasketing (Set) S88 BL x DOW x DOH PE
Set: 26 – Corridor Storage/Utility

Doors: 114, 115, 152-B, 153, 233, 236, 243

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Door Stop	481	US26D	RO
<i>(For door 152-B and 153 only)</i>			
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 26.1 – Corridor Storage/ELA

Doors: 130B-A, 107, 126, 157, 206A-B, 226A-B, 228, 230, 235, 237

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Door Stop	481	US26D	RO
<i>(For door 103B-A and 157 only)</i>			
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 27 – Shared Door

Doors: 103B-B

3 Hinge	T4A3786 5" x 5" NRP	US26D	MK
1 Storeroom Lockset	ML2022 PSA x temporary core x D200 x CMK	626	RU
2 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 28 – Control

Doors: 103C-A

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Classroom Lockset	ML2055 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
1 Threshold	151 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Automatic Door Bottom	434 APKL x DOW		PE

Set: 28.1 – Production

Doors: 103D

3 Hinge	T4A3786 5" x 5" NRP	US26D	MK
1 Classroom Lockset	ML2055 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Wall Stop	406	US32D	RO
1 Threshold	151 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Automatic Door Bottom	434 APKL x DOW		PE

Set: 29 – Corridor Control

Doors: 103C-B

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC5230 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Threshold	151 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Automatic Door Bottom	434 APKL x DOW		PE

Set: 30 – Speech

Doors: 104

3 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Door Stop	481	US26D	RO
1 Threshold	151 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Automatic Door Bottom	434 APKL x DOW		PE

Set: 30.1 – Chorus

Doors: 138

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Threshold	151 A x DOW x MS & ES25		PE

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1 Gasketing (Set)	S88 BL x DOW x DOH	PE
1 Automatic Door Bottom	434 APKL x DOW	PE

Set: 31 – OT/PT

Doors: 105

3 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH	PE	

Set: 31.1 – Classroom

Doors: 108, 109-A, 111-A, 112-A, 113-A, 121-A, 122-A, 124-A, 125-A, 127, 128, 130, 131, 133, 201, 202, 204, 205, 206, 207, 208, 210, 211, 216, 217, 219, 220, 221, 222, 223, 224, 226, 242

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH	PE	

Set: 31.2 – Classroom

Doors: 212, 213, 227

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Overhead Stop	9-X36 x 90 deg	652	RF
1 Gasketing (Set)	S88 BL x DOW x DOH	PE	

Set: 31.3 – Classroom

Doors: 214-A, 214-B

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Overhead Stop	1-X36 x 90 deg	652	RF

Gasketing furnished by frame manufacturer

Set: 32 – Classroom Toilet

Doors: 109A, 111A, 112A, 113A, 116A, 121A, 122A, 124A, 127A, 128A, 130A, 131A, 133A

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Privacy Set	ML2060 PSA x M19V	626	RU
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO
1 Finger Guard	2248 A x 76"		NG

Set: 33 – Mechanical Room

Doors: 110, 118, 123, 129, 132, 203, 209, 215, 218, 225

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Threshold	151 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Automatic Door Bottom	434 APKL x DOW		PE

Set: 33.1 – Mechanical Room

Doors: 136C

3 Hinge	TA2714 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6210 x A3	689	RU
1 Wall Stop	406	US32D	RO
1 Threshold	151 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Automatic Door Bottom	434 APKL x DOW		PE

Set: 34 – Digital Learning/Makers Space

Doors: 119-A, 120

3 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC5230 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 35 – Shared Door

Doors: 119-B

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2022 PSA x temporary core x CMK	626	RU
2 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6210 A3 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 36 – Exterior Kindergarten

Doors: 111-B

3 Hinge	T4A3386 4-1/2" x 4-1/2" NRP	US32D	MK
1 Exit Device	ED5200 x M51 x M110 x M54	630	RU
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Gasketing (Set)	316 AS x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 36.1 – Exterior Kindergarten

Doors: 113-B, 121-B

1 Pivot (Set)	147	626	RU
1 Intermediate Pivot	M19	626	RU
1 Exit Device	ED5200 x VT957 x less cylinder x M52 x M110 x M54	630	RU
1 Rim Cylinder		US26D	MC
1 Mortise Cylinder		US26D	MC
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Gasketing furnished by frame manufacturer

Set: 36.2 – Exterior Child Development/Kindergarten/Pre-kindergarten

Doors: 109-B, 122-B, 124-B, 125-B, ST2-D

1 Pivot (Set)	147	626	RU
1 Intermediate Pivot	M19	626	RU
1 Exit Device	ED5200 x M51 x M110 x M54	630	RU
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Gasketing furnished by frame manufacturer

Set: 37 – Instrumental

Doors: 139

6 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
2 Flush Bolt	555 x 12"	US26D	RO
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
2 Door Stop	481	US26D	RO
1 Threshold	171 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Astragal	355 CS x DOH		PE

Set: 38 – Storage

Doors: 139A

6 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Permanent Core	1C Series x MK	626	BE
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Dummy Lever	ML2050 PSA	626	RU
2 Flush Bolt	555 x 12"	US26D	RO
1 Dust Proof Strike	570	US26D	RO
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
2 Wall Stop	406	US32D	RO
2 Silencer	608		RO

Wood astragal furnished by door manufacturer

Set: 39 – Storage

Doors: 140A, 140B

6 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
2 Flush Bolt	557	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Closer/Stop <i>(For active leaf of pair only)</i>	DC6210 A11 x M54	689	RU
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
1 Overhead Stop <i>(For inactive leaf of pair only)</i>	9-X36 x 90 deg	652	RF
2 Silencer	608		RO

Astragal furnished by door manufacturer

Set: 40

Not Used

Set: 40.1 – Gymnasium/Kitchen Office

Doors: 142G, 140D, 140E

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 41 – Exterior Mechanical Enclosure

Doors: 141D-A, 141D-B

6 Hinge	TA2314 4-1/2" x 4-1/2" NRP	US32D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x C x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Flush Bolt (Top)	555 x 12"	US26D	RO
2 Overhead Holder	1-X36 x 90 deg	652	RF
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Drip Strip	346 C x DOW + 4"		PE

Flat metal astragal furnished by door manufacturer

Set: 42 – Gymnasium/Kitchen/Platform Storage

Doors: 140C, 142D, 156

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 42.1 – Kitchen Storage

Doors: 142C

3 Hinge	T4A3786 5" x 5" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 42.2 – Corridor/Kitchen Storage

Doors: 142B, 147A-A

3 Hinge	T4A3786 5" x 5"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 43 – Serving

Doors: 142A-A, 142A-B, 142A-C, 142A-D

3 Hinge	T4A3786 5" x 5" NRP	US26D	MK
1 Office Lockset	ML2051 PSA x temporary core x D200 x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Overhead Holder	9-X26 x 90 deg	652	RF
3 Silencer	608		RO

Set: 44 – Personnel

Doors: 142E

3 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Push Plate	70C 4 x 16	US32D	RO
1 Pull Plate	110 x 70C 4 x 16	US32D	RO
1 Closer	DC5230 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

Set: 45 – Exterior Receiving

Doors: 142H

3 Hinge	T4A3386 4-1/2" x 4-1/2"	US32D	MK
1 Storeroom Lockset	ML2057 PSA x less cylinder	626	RU
1 Mortise Cylinder		US26D	MC
1 Closer	DC6200	689	RU
1 Armor Plate	K1050 30" x 2" LDW 4BE CSK	US32D	RO
1 Overhead Holder	1-X36 x 90 deg	652	RF
1 Threshold	1715 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE
1 Aiphone Buzzer	Furnished and installed by security contractor		00
1 Viewer	622	US26D	RO

Set: 46 – Electric Room

Doors: 143

6 Hinge	TA2714 4-1/2" x 4-1/2" NRP	US26D	MK
1 Exit Device	ED5200 x PR957 x temporary core x M51 x M110 x M54 x CMK	630	RU
1 Exit Device	ED5200 x PR950 x temporary core x M52 x M110 x M54 x CMK	630	RU
1 Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x less cylinder		RU
3 Permanent Core	1C Series x MK	626	BE
2 Closer/Stop	DC6210 A11 x M54	689	RU
2 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
2 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Mullion Door Seal	5110 BL x DOH		PE

Set: 47 – Exterior Electric Room

Doors: 143B

3 Hinge	TA2314 4-1/2" x 4-1/2" NRP	US32D	MK
1 Exit Device	ED5200 x VT957 x less cylinder x M51 x M110 x M54	630	RU
1 Rim Cylinder		US26D	MC
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Gasketing (Set)	316 AS x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 48 – Mechanical Room

Doors: 144-A

6 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
2 Flush Bolt	557	US26D	RO
1 Closer	DC6200 x M54	689	RU
<i>(For active leaf of pair only)</i>			
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
2 Door Stop	481	US26D	RO
1 Threshold	171 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE

Astragal furnished by door manufacturer

Set: 48.1 – Mechanical Room

Doors: 141B-A

6 Hinge	TA2714 4-1/2" x 4-1/2" NRP	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
2 Flush Bolt	555 x 12"	US26D	RO
1 Closer/Stop	DC6210 x A11 x M54	689	RU
<i>(For active leaf of pair only)</i>			
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
1 Overhead Stop	9-X36 x 90 deg	652	RF
<i>(For inactive leaf of pair only)</i>			
1 Threshold	171 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Astragal	355 CS x DOH		PE

Set: 49 – Exterior Mechanical Room

Doors: 144-B

6 Hinge	TA2314 4-1/2" x 4-1/2" NRP	US32D	MK
1 Storeroom Lockset	ML2057 PSA x less cylinder	626	RU
1 Mortise Cylinder		US26D	MC
2 Flush Bolt	555 x 12"	US26D	RO
1 Closer/Stop	DC6210 A11 x M54	689	RU
<i>(For active leaf of pair only)</i>			
2 Kickplate	K1050 8" x 1" LDW 4BE CSK	US32D	RO
1 Overhead Stop	9-X36 x 90 deg	652	RF
<i>(For inactive leaf of pair only)</i>			
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Gasketing (Set)	316 AS x DOW x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Flat metal astragal furnished by door manufacturer

Set: 50 – Community Area

Doors: 147-A

3 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Exit Device	ED5200A x PR955 x temporary core x M110 x M54 x CMK	630	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6210 A3 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
3 Silencer	608		RO
1 Electromagnetic Holder	998 x 24VDC	689	RF

Electromagnetic holder to be tied into the building fire alarm system

Set: 50.1 – Community Area

Doors: 147-C

3 Hinge	T4A3786 5" x 5" NRP	US26D	MK
1 Exit Device	ED5200 x PR955 x temporary core x M52 x M110 x M54 x CMK	630	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6210 A3 x M54	689	RU
1 Closer/Holder	DC6210 A12 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 51 – Exterior Community Area

Doors: 147-D

1 Pivot (Set)	147	626	RF
1 Electric Intermediate Pivot	M19 x QC-12	626	RF
1 ElectroLynx Harness	QC-C1500P		MK
<i>(Install between electric intermediate pivot and junction box)</i>			
1 Electric Latch Retraction Exit Device (Fail Secure)	ED5200 x VT957 x less cylinder x MELR x M51 x M54 x M110 x 24VDC	630	RU
1 ElectroLynx Harness	QC-CXXX x required length		MK
<i>(Install between electric hinge and electric latch retraction exit device)</i>			
1 Rim Cylinder		US26D	MC
1 Closer/Stop	DC6210 A11 x M77 x M54	689	RU
1 Mounting Bracket	597F58	689	RU
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE
1 Card Reader	Furnished and installed by security contractor		00
1 Door Position Switch	DPS-M-BK		SU
1 Controller	782		RU
1 Wiring Diagram	WD-SYSPK		RU

Gasketing furnished by frame manufacturer

Card reader to be used by authorized persons to gain entry from the exterior side of the opening

Card reader to be used to retract the latch of the electric latch retraction exit device

Push bar of electric latch retraction exit device always free for immediate egress

Set: 53 – Exterior Storage

Doors: 147A-B, 152-A

3 Hinge	TA2314 4-1/2" x 4-1/2" NRP	US32D	MK
1 Storeroom Lockset	ML2057 PSA x less cylinder	626	RU
1 Mortise Cylinder		US26D	MC
1 Latch Protector	321	US32D	RO
1 Closer/Stop	DC6210 A11 x M54	689	RU
1 Armor Plate	K1050 30" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Gasketing (Set)	316 AS x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 54 – Group Toilet

Doors: 134, 135, 150-A, 151-A

3 Hinge	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1 Security Classroom Deadlock	DL4122 x temporary core x CMK	626	RU
2 Permanent Core	1C Series x MK	626	BE
1 Closer	DC5230 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Door Stop	481	US26D	RO
<i>(For door 151-A only)</i>			
3 Silencer	608		RO

Set: 55 – Exterior Group Toilet

Doors: 150-B, 151-B

3 Hinge	T4A3386 4-1/2" x 4-1/2"	US32D	MK
1 Deadlock	DL4112 x less cylinder	626	RU
2 Mortise Cylinder		US26D	MC
1 Push Plate	70C 4 x 16	US32D	RO
1 Pull Plate	110 x 70C 4 x 16	US32D	RO
1 Closer	DC6200 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Threshold	1715 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 56 – Exterior Can Wash

Doors: 154

3 Hinge	T4A3386 4-1/2" x 4-1/2"	US32D	MK
1 Storeroom Lockset	ML2057 PSA x less cylinder	626	RU
1 Mortise Cylinder		US26D	MC
1 Closer	DC6200	689	RU
1 Armor Plate	K1050 30" x 2" LDW 4BE CSK	US32D	RO
1 Door Stop & Holder	494	US26D	RO
<i>(Install at top of door)</i>			
1 Threshold	1715 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 57 – Overhead Roll-up Door

Doors: 155

1 Cylinder	“As required” x MK	US26D	MC
Balance of hardware by door manufacturer			

Set: 57.1

Not Used

Set: 58 – Custodian

Doors: 229

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lockset	ML2057 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Closer	DC6200	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
1 Gasketing (Set)	S88 BL x DOW x DOH		PE

Set: 59 – Lift

Doors: 141C

2 Hinge	T4A3786 4-1/2" x 4-1/2" NRP	US26D	MK
1 Electric Hinge <i>(Install at middle hinge)</i>	T4A3786 4-1/2" x 4-1/2" QC-12	US26D	MK
1 ElectroLynx Harness <i>(Install between electric hinge and junction box)</i>	QC-C1500P		MK
1 Mortar Guard	MG-16	US2C	MK
1 Electrified Lockset (Fail Secure)	ML20906-SEC x PSA x temporary core x CMK x 24VDC	626	RU
1 ElectroLynx Harness <i>(Install between electric hinge and electrified lockset)</i>	QC-CXXX x required length		MK
1 Closer	DC5230 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
3 Silencer	608		RO
1 Power Supply	AQD3		SU
1 Wiring Diagram	WD-SYSPK		RU

Electrified lockset to be tied into the lift system
 Door may not be opened unless the lift is at the cafeteria level
 When the lift is at the cafeteria level the cafeteria side lever of the electrified lockset to be unlocked
 Lift to remain at platform level when not in use

Set: 60 – Exterior Storage

Doors: 158

3 Hinge	T4A3386 4-1/2" x 4-1/2"	US32D	MK
1 Storeroom Lockset	ML2057 PSA x less cylinder	626	RU
1 Mortise Cylinder		US26D	MC
1 Closer	DC6200 x M54	689	RU
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Threshold	1715 A x DOW x MS & ES25		PE
1 Gasketing (Set)	S88 BL x DOW x DOH		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Set: 61 – Roof

Doors: 002-C

1 Pivot (Set)	147	626	RF
1 Intermediate Pivot	M19	626	RF
1 Storeroom Lockset	ML2022 PSA x less cylinder	626	RU
2 Mortise Cylinder		US26D	MC
1 Closer/Holder	DC6210 A12 x M77 x M54	689	RU
1 Mounting Bracket	597F58	689	RU
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
1 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Gasketing furnished by frame manufacturer

Set: 62 – Exterior Corridor

Doors: 005-B, 005-C

6 Hinge	T4A3386 4-1/2" x 4-1/2" NRP	US32D	MK
2 Alarmed Exit Device	ED5200 x less cylinder x M110 x M54	630	RU
1 Removable Mullion <i>(Removable mullion to be cut to size in the field)</i>	910KM x 120" x less cylinder		RU
3 Mortise Cylinder		US26D	MC
2 Closer/Stop	DC6210 A11 x M77 x M54	689	RU
2 Mounting Bracket	597F58	689	RU
1 Threshold	272 A x 1842 AS x DOW x MS & ES25		PE
	<i>(Threshold to be notched for removable mullion in the field)</i>		
1 Mullion Door Seal	5110 BL x DOH		PE
2 Door Bottom Seal	321 CN x DOW		PE
1 Drip Strip	346 C x DOW + 4"		PE

Gasketing furnished by frame manufacturer

Set: 63 – Condiment

Doors: 147E

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Classroom Lockset	ML2055 PSA x temporary core x CMK	626	RU
1 Permanent Core	1C Series x MK	626	BE
1 Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	RO
1 Mop Plate	K1050 4" x 1" LDW 4BE CSK	US32D	RO
1 Wall Stop	406	US32D	RO
3 Silencer	608		RO

END OF SECTION 08 71 00

SECTION 08 90 00 - LOUVERS AND VENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide louvers and vents where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Section Includes:
 - 1. Fixed metal wall louvers.
 - 2. Blank-off panels for wall louvers.
- C. Related Documents/Sections: Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:
 - 1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
 - 2. Section 07901 - Joint Sealants: Sealants installed in perimeter joints between louver frames and adjoining construction.
 - 3. Division 15 - Mechanical: Ductwork connected to metal wall louvers.

1.2 DEFINITIONS

- A. Louver Terminology: Refer to AMCA Publication 501-85 for definitions of terms for metal louvers not otherwise defined in this section or referenced standards.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design, engineer, fabricate, and install exterior metal wall louvers to withstand the effects of loads and stresses from wind and normal thermal movement, without evidencing permanent deformation of louver components including blades, frames, and supports; noise or metal fatigue caused by louver blade rattle or flutter; and permanent damage to fasteners and anchors:
 - 1. Wind Load: Uniform pressure (velocity pressure) of 20 lbf per sq. ft. acting inwards or outwards.
 - 2. Normal thermal movement is defined as that resulting from the following maximum change (range) in ambient temperature. Base design calculations on actual surface temperatures of metals due to both solar heat gain and night time sky heat loss.
 - a. Temperature Change (Range): 100 deg F (55.5 deg C).
- B. Air Performance, Water Penetration, and Air Leakage Ratings: Provide louvers complying with performance requirements indicated as demonstrated by testing manufacturers stock units, of height and width indicated, according to Air Movement and Control Association (AMCA) Standard 500.

1.4 SUBMITTALS

- A. General:

1. Identify proposed changes, differences, and discrepancies, including verbiage, terms, and definitions, between Contract Documents and submittals.
 2. LEED Submittals:
 - a. Regional Materials MR Credit 5.1 : Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- B. Product Data:
1. For each type of product indicated, submit manufacturer's specifications and other data needed to prove compliance with the specified requirements.
- C. Shop Drawings:
1. Submit drawings prepared under the supervision of a professional engineer currently licensed to practice in jurisdiction in which the Project is located.
 2. Provide setting drawings, templates, and directions for the installation of anchor bolts and other anchorages installed as a unit of work under other sections.
 3. Include plans, elevations, sections, and details showing profiles, angles, spacing of louver blades; unit dimensions related to wall openings and construction; free areas for each size indicated; and profiles of frames at jambs, heads and sills.
 - a. Where installed products are indicated to comply with certain structural design loadings, include structural computations, material properties, and other information needed for structural analysis which has been prepared by, or under the supervision of, a qualified professional engineer.
- D. Samples:
1. Samples for Verification Purposes:
 - a. Each type of metal finish required, prepared on 6 inch square metal samples of same thickness and alloy indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.
- E. Quality Control Submittals:
1. Tests:
 - a. Product test reports evidencing compliance of units with performance requirements indicated.
 2. Certificates:
 - a. Product certificates signed by louver manufacturers certifying that their products which comply with Project requirements are licensed to bear AMCA Seal based on tests made in accordance with AMCA Standard 500 and complying with AMCA Certified Ratings Program.
 - b. Installer certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.
 3. Qualification Data:
 - a. Submit data for firms and persons specified under "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed

projects with project name(s), address(es), names of Architect(s) and Owner(s), plus other specified information.

4. Manufacturer's Instructions:
 - a. Submit manufacturer's recommended installation procedures which, when reviewed by the Architect, may become the basis for accepting or rejecting actual installation procedures used on the work.

F. Contract Closeout Submittals:

1. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Architect requisite copies of the following.
 - a. Project Record Documents.
 - b. Operation and Maintenance Data.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain louvers and vents from a single source where alike in one or more respects with regard to type, design, and factory-applied color finish.
- B. Qualify welding processes and welding operators in accordance with D1.2 "Structural Welding Code - Aluminum" and D1.3 "Structural Welding Code - Sheet Steel."
 1. Certify that each welder employed in unit of Work of this section has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
 2. Testing for recertification is Contractor's responsibility.
- C. Engineer Qualifications: Professional engineer licensed to practice in jurisdiction where project is located and experienced in providing engineering services of the kind indicated which has resulted in the successful installation of louvers similar in material, design, and extent to that indicated for this Project.
- D. SMACNA Standard: Comply with SMACNA "Architectural Sheet Metal Manual" recommendations for fabrication, construction details, and installation procedures.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Check actual louver openings by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Louvers:

Representative Manufacturer:

- a. Construction Specialties, Inc. 6696 Route 405 Highway. Muncy, Pennsylvania 800-233-8493 www.c-sgroup.com

Equal Manufacturers:

- b. Airstream Products Div., Penn Ventilator Co., Inc.
- c. Aiolite Co.
- d. Ruskin Mfg. Div., Phillips Industries, Inc.

2.2 MATERIALS

- A. Galvanized Steel Sheet: ASTM A 526 or A 527, G90 zinc coating, mill phosphatized.
- B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer to produce required finish.
- C. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5 or T-52.
- D. Fasteners: Of same basic metal and alloy as fastened metal, unless otherwise indicated. Do not use metals which are corrosive or incompatible with materials joined.
 - 1. Use types, gages, and lengths to suit unit installation conditions.
 - 2. Use Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
- E. Anchors and Inserts: Of type, size, and material required for type of loading and installation indicated. Use nonferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or expansion bolt devices for drilled-in-place anchors.
- F. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).
- G. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, complying with SSPC-Paint-20.

2.3 FABRICATION, GENERAL

- A. General: Fabricate louvers and vents to comply with requirements indicated for design, dimensions, materials, joinery, and performance.
- B. Preassemble louvers in shop to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of size indicated with allowances made for fabrication and installation tolerances of louvers, adjoining construction, and perimeter sealant joints.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated but not further apart than recommended by manufacturer, or 72 inches o.c., whichever is less. At horizontal joints between louver units provide horizontal mullions except where continuous vertical assemblies are indicated.

- G. Provide sill extensions and loose sills made of same material as louvers, where indicated, or required for drainage to exterior and to prevent water penetrating to interior.
- H. Join frame members to one another and to fixed louver blades as follows, unless otherwise indicated, or size of louver assembly makes bolted connections between frame members necessary:
 - 1. With fillet welds, concealed from view; or mechanical fasteners; or a combination of these methods; as standard with louver manufacturer.

2.4 FIXED FORMED SHEET METAL WALL LOUVERS

- A. 6" High Performance Drainable Fixed Mullion Louvers: Frames and louver blades fabricated from metal of kind and in form indicated below.
 - 1. Louver Blade Metal and Thickness: Aluminum sheet, 18 ga. inch, unless otherwise indicated.
 - 2. Frame Metal and Thickness: Extruded aluminum, 18 ga. inch, unless otherwise indicated.
 - 3. Frame Metal and Thickness: As indicated.
 - 4. Louver Depth: 6 inches, unless otherwise indicated.
 - 5. Louver Blade:
 - 6. Performance Requirements: As follows, determined by testing units 48 inches wide by 48 inches high per AMCA Standard 500:
 - a. Louver Free Area: Not less than 50% s.f.
 - b. Static Pressure Loss: Not more than 0.1 inch pressure drop at an airflow of 500 fpm free area intake velocity. Exhaust Pressure drop at the point of beginning water penetration 0.16 in. H₂O.
 - c. Water Penetration: Not more than 0.02 oz. per s.f. of free area at an airflow of 1100 fpm free area velocity when tested for 15 minutes.
 - 7. AMCA Seal: Mark units with AMCA Certified Ratings Seal.
 - 8. Representative Product:
 - a. Louver: Model LS-200 with 2252 by Construction Specialties.
 - a. Louver Depth: 6".

2.5 BLANK-OFF PANELS

- A. General: Provide aluminum faced blank-off panels complying with the following requirements:
 - 1. Aluminum Faced Blank-off Panels: Exterior Face to be Aluminum with same finish and color to match the aluminum louvers. Aluminum face shall be factory laminated to MDO *Medium Density Overlay) Board.
 - 2. Fabricate blank-off panels to sizes indicated..

2.6 LOUVER SCREENS

- B. General: Provide each exterior louver with louver screens complying with the following requirements:
 - 2. Screen Location for Fixed Louvers: Interior face, unless otherwise indicated.
 - 3. Screening Type: Bird screening, unless otherwise indicated.
- C. Secure screens to louver frames with stainless steel machine screws, spaced at each corner and at 12 inch o.c. between.
- D. Louver Screen Frames: Fabricate screen frames with mitered corners to louver sizes indicated and to comply with the following requirements:
 - 1. Metal: Same kind and form of metal as indicated for louver frames to which screens are attached.
 - a. Reinforce extruded aluminum screen frames at corners with clips.
 - 2. Finish: Same finish as louver frames to which louver screens are attached.
 - 3. Type: Rewireable frames with a driven spline or insert for securing screen mesh.
- E. Louver Screening for Aluminum Louvers: Fit aluminum louver screen frames with screening covering louver openings and complying with the following requirements:
 - 1. Bird Screening: 1/2 inch square mesh formed with 0.080 inch diameter aluminum wire.

2.7 FINISHES, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B. Finish louvers after assembly.

2.7 ALUMINUM FINISHES

- A. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.
- B. High-Performance Organic Coating: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: chemical conversion coating, acid chromate-fluoride-phosphate pretreatment; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
 - 1. Fluorocarbon 2-Coat Coating System: Manufacturer's standard 2-coat thermocured system, complying with AAMA 605.2, composed of specially formulated inhibitive primer and fluorocarbon color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight.
 - 2. Custom color.

PART 3 - EXECUTION

3.1 PREPARATION

LOUVERS AND VENTS

- A. Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorages which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION

- A. Locate and place louver units plumb, level, and in proper alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Repair finishes damaged by cutting, welding, soldering, and grinding operations require for fitting and jointing. Restore finishes so there is no evidence of corrective work. Return items which cannot be refinished in field to shop, make required alterations and refinish entire unit, or provide new units.
- F. Protect galvanized and nonferrous metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete, masonry, or dissimilar metals.
- G. Install concealed gaskets, flashings, joint fillers, and insulation, as louver installation progresses where required to make louver joints weathertight. Comply with Section 07901 - Joint Sealants for sealants applied during installation of louver.

3.3 ADJUSTING AND PROTECTION

- A. Protect louvers and vents from damage of any kind during construction period including use of temporary protective coverings where needed and approved by louver manufacturer. Remove protective covering at time of Substantial Completion.
- B. Restore louvers and vents damaged during installation and construction period, so that no evidence remains of correction work. If results of restoration are unsuccessful, as judged by Architect, remove damaged units and replace with new units.
 - 1. Clean and touch-up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.
- C. Test operation of adjustable wall louvers and adjust as needed to produce fully functioning units which comply with requirements.

3.4 CLEANING

- A. Periodically clean exposed surfaces of louvers and vents, which are not protected by temporary covering, to remove fingerprints and soil during construction period; do not let soil accumulate until final cleaning.
- B. Before final inspection, clean exposed surfaces with water and with a mild soap or detergent not harmful to finishes. Rinse thoroughly and dry surface.

END OF SECTION 08 90 00

SECTION 08 91 10 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes conventionally glazed aluminum curtain walls integrated with a compatible sloped curtain wall system installed as stick systems.
- B. Related Documents/Sections: Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:
 - 1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
 - 2. Specification Division 8 Glazing.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide glazed aluminum curtain-wall systems, including anchorage, capable of withstanding, without failure, the effects of the following:
 - 1. Structural loads.
 - 2. Thermal movements
 - 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 4. Dimensional tolerances of building frame and other adjacent construction.
 - 5. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferred to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
 - d. Noise or vibration created by wind and thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Sealant failure.
- B. Structural Loads:
 - 1. Basic Wind Speed: 110 mph (49 m/s).
 - 2. Wind load: 40 psf.
 - 3. Risk Category: II.

4. Exposure: B.
5. Seismic Loads: In accordance with local code requirements.
6. Blast Loads: In accordance with local code requirements.

C. Structural-Test Performance: Systems tested according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Duration: As required by design wind velocity but not less than 60 seconds.

D. Deflection of Framing Members:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Cantilever Deflection: Where framing members overhang an anchor point, limited to 2 times the length of cantilevered member, divided by 175.

E. Temperature Change (Range): There shall be no buckling, stress on glass, edge seal failure, excess stress on curtainwall structure, anchors and fasteners or reduction in performance when tested in accordance with AAMA 501.5-98 at a temperature range of 0° to 180° F.

F. Failures: There shall be no "Life/Safety" type failures (glass breakage, anchor failures, or structural damage) when tested in accordance with AAMA 501.4, seismic test (lateral cycling.)

G. Air Infiltration: For systems, maximum air leakage of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure differential of 6.24 lbf/sq. ft.

H. Water Penetration Under Static Pressure: Systems do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 15 lbf/sq. ft. Maximum Load = 45-50 psf at roof level..

I. Condensation Resistance: For systems, condensation-resistance factor (CRF) of not less than 68 when tested according to AAMA 1503.1-98.

J. Thermal Transmittance (U-factor):

1. Glass and framing areas shall have U-factor of no greater than 0.33 with 1" High Performance (HP) Glass as determined according to AAMA 1503 OR Project specific () BTU/Hr/Ft²/°F per AAMA 507 OR () BTU/Hr/Ft²/°F per NFRC 100.

1.4 SUBMITTALS

- A. Product Data: For each product indicated.
- B. LEED Submittals:

1. Product Data for Credit IEQ 4.1: For glazing sealants used inside the weatherproofing system, documentation including printed statement of VOC content.
 2. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.
 - a. Aluminum extrusions that contain at least 60% post-industrial recycled content
 3. Regional Materials MR Credit 5.1: Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- C. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication and assembly of glazed aluminum curtain-wall systems.
1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples: For each exposed finish.
- E. Product test reports.
- F. Field quality-control test reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Acceptable to manufacturer and capable of preparing data for glazed aluminum curtain-wall systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
1. Provide Initial Mock-up of Curtainwall at location shown on Drawings.
 2. Mockup to include an actual Curtainwall unit in configurations shown on the drawings. Mockup shall include all work specified and shown on the drawings for the Curtainwall installation including cleaning and painting of existing steel lintels, installation of new window flashings backer rod and sealant, and repair of adjacent materials.
 3. Field testing shall be performed on mockups according to requirements in "Field Quality Control" Article.
 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained
 5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- C. Preinstallation Conference: Conduct conference at Project site.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of glazed aluminum curtain-wall systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration caused by thermal movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water leakage.
 - e. Failure of operating components to function normally.
 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Kawneer Company, Inc.
 2. YKK AP America Inc.
 3. Oldcastle Building Envelope.
 4. EFCO Corporation.
- B. Basis-of-Design Product: The design for glazed aluminum curtain-wall systems is based on:
1. Manufacturer:
 - b. Proprietary Product(s)/System(s): Curtain wall system integrated with sloped glazing system as follows:
 - 1) Kawneer Aluminum Curtain Wall System
 - a) Series: 1600UT Wall System®
 - b) Sizes: 2 ½" x 6".
 - 2) YKK Aluminum Curtain Wall System
 - a) Series: YCW 750 OGP Curtain Wall System®
 - b) Sizes: 2 ½" x 6".
 - 3) Oldcastle Aluminum Curtain Wall System
 - a) Series: Reliance System®
 - b) Sizes: 2 ½" x 6 ¼".
 - 4) EFCO Aluminum Curtain Wall System

- a) Series: 5600 T System
- b) Sizes: 2 ½" x 6".

c. Finish/Color: See 2.06 Finishes

2.2 FRAMING SYSTEMS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 - 2. Extrusions: Shall be of aluminum alloy 6063-T5 or 6063-T6 (as required), manufactured within commercial tolerance and free from defects impairing strength and/or durability.
 - 3. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221 (ASTM B 221M).
 - 4. Extruded Structural Pipe and Tubes: ASTM B 429.
- B. Steel Reinforcement: When Steel Reinforcement is required provide manufacturer's standard corrosion-resistant primer.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 611.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads.
 - 4. Finish exposed portions to match framing system.
 - 5. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
- E. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- F. Concealed Flashing: "Blueskin TWF" by Henry Company/Bakor. See Specification section 04810.
- G. Framing Gaskets: As recommended by manufacturer for joint type.
- H. Thermal Barrier: Thermal Barriers as manufactured by the primary curtainwall manufacturer.

- I. Framing Sealants: As recommended by manufacturer for joint type.
- J. Shadow Box Panels: Aluminum Faced Insulated Panels to be installed behind the insulating glass panels. Aluminum Finish to match windows. Provide natural air flow type venting to interior of building as shown on the drawings.

2.3 GLAZING SYSTEMS

- A. Glazing: As specified in Division 8 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer for joint type.

2.4 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.5 CUSTOM MULLION COVERS

- A. In addition to standard mullion covers provide custom mullion covers where shown on the drawings and in the sizes and shapes shown on the drawings.

2.6 ALUMINUM SPANDREL PANELS – Laminated

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Laminated metal faced panels as manufactured by curtainwall manufacturer or by one of the following.
 - 1) Kingspan.
 - 2) Vicwest.
 - 3) Reynolbond.
- 2. Finish: Clear Anodized Aluminum to match curtainwall.
- 3. Fabrication:
 - a. Exterior Substrate: Aluminum to match curtainwall
 - b. Core: Polystyrene
 - c. Interior Substrate: Solid Plastic (SPS)
 - d. Tolerances - .8% of panels dimension length and width - (+/-) 1/16" thickness
 - e. Panel Thickness - 1"
 - f. R-Value - 4.58

g. U-Value - 0.22

2.7 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Fabricate components that, when assembled, have the following characteristics:
 - 1. Sharp profiles, straight and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Internal guttering systems or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to prevent glazing-to-glazing contact and to maintain required glazing edge clearances.
 - 6. Provisions for reglazing from exterior.
- C. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- D. Factory-Assembled Frame Units:
 - 1. Rigidly secure nonmovement joints.
 - 2. Seal joints watertight, unless otherwise indicated.
 - 3. Pressure equalize system at its interior face.
 - 4. Install glazing to comply with requirements in Division 8 Section "Glazing."
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Anodic Finish: Clear Anodic Finish: AAMA 611,[AA-M12C22A42/A44, Class I, 0.018 mm AA-M12C22A32/A34 or thicker.
 - 1. Color: Kawneer Clear Anodic Finish Aluminum Association Specification AA-M10C22A44, Architectural Class I (.7 mils minimum).

2.9 WINDOW AND CURTAIN WALL FLASHING MATERIALS

- A. Elasticized polyethylene laminate Flashing Tape. Manufacturer's flashing installed in accordance with the manufacturer's recommendations. Type as indicated below:
 - 1. Henry "Blueskin SA": by Henry Company/Bakor.
 - 2. Description: Self Adhering composite membrane consisting of an SBS rubberized asphalt compound which is integrally laminated to a blue, high density, cross-laminated polyethylene film. Membrane to span gap between wall and window frame around entire window perimeter.

3. Installation: Continuous around all widow jambs and heads. Flashing at all window jambs shall overlap the membrane Sill Flashing System at the window sills.

2.8 SILL FLASHING DRIP PLATE

- A. Drip Plate sill flashing system installed in accordance with the manufacturer's recommendations.
 1. Hohman & Barnard Drip Plates: Hohman & Barnard Inc, 30 Ransons Court, Hauppauge, New York 11788. Tel: 800-645-0616.
 2. Drip Plate: FTSA-LB Drip Plate Type 304 (dull stainless steel) with factory formed hemmed drip edge with end dams.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Fit joints to produce hairline joints free of burrs and distortion.
 2. Rigidly secure nonmovement joints.
 3. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 4. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
 5. Seal joints watertight, unless otherwise indicated.
- B. Metal Protection:
 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- F. Install glazing as specified Division 8 Section "Glazing."
- G. Install sealants as specified in Division 7 Section "Joint Sealants."
- H. Install insulation materials as specified in Division 7 Section "Building Insulation."

- I. Install perimeter fire-containment systems (safing insulation) as specified in Division 7 Section Firestopping.
- J. Erection Tolerances: Install glazed aluminum curtain-wall systems to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet.
 - 2. Level: 1/8 inch in 20 feet.
 - 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or greater, limit offset from true alignment to 1/4 inch.
 - 4. Location: Limit variation from plane to 1/8 inch in 12 feet ; 1/2 inch over total length.

3.2 FIELD QUALITY CONTROL

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections.
 - 1. Acceptable Testing Agency:
Architectural Testing, 130 Derry Court, York, PA 17402. Tel: 717-674-4129. Website: www.archtest.com.
- B. Testing Services: Testing and inspecting of representative areas to determine compliance of installed systems with specified requirements shall take place as follows and in successive phases as indicated on Drawings. Do not proceed with installation of the next area until test results for previously completed areas show compliance with requirements.
 - 1. Structural-Sealant Compatibility and Adhesion: Structural sealant shall be tested according to recommendations in ASTM C 1401.
 - a. Destructive Test Method A, "Hand Pull Tab (Destructive)," in ASTM C 1401, Appendix X2, shall be used.
 - 1) A minimum of one area on building face shall be tested.
 - 2) Repair installation areas damaged by testing.
 - 2. Air Infiltration: Areas shall be tested for air leakage of 1.5 times the rate specified for laboratory testing under "Performance Requirements" Article, but not more than 0.09 cfm/sq. ft. (0.03 L/s per sq. m), of fixed wall area when tested according to ASTM E 783 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa) 6.24 lbf/sq. ft. (300 Pa)
 - 3. Water Penetration: Areas shall be tested according to ASTM E 1105 at a minimum uniform and cyclic static-air-pressure difference of 0.67 times the static-air-pressure difference specified for laboratory testing under "Performance Requirements" Article, but not less than 4.18 lbf/sq. ft. (200 Pa), and shall not evidence water penetration.

4. Water Spray Test: Before installation of interior finishes has begun, a minimum area of 75 feet (23 m) by 1 story of aluminum-framed systems designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.

END OF SECTION 08 91 10

SECTION 09 29 00 - GYPSUM BOARD ASSEMBLIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide “synthetic gypsum” gypsum board assemblies where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Section Includes:
 - 1. Non-load bearing steel framing members for gypsum board assemblies.
 - 2. Gypsum board assemblies.
 - 3. Glass-mesh mortar units for application of tile.
 - 4. Gypsum Sheathing.
 - 5. Abuse Resistant Gypsum Wallboard (Public Spaces and Corridors)
- C. Products Installed but not specified under this Section:
 - 1. Acoustical insulation in partitions - acoustical insulation is furnished under Division 7 Section - Building Insulation.
 - 2. Acoustical sealants - acoustical sealants are furnished under Division 7 Section – Joint Sealants.
- D. Related Documents/Sections: Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:
 - 1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
 - 2. Division 7 Section - Building Insulation.
 - 3. Division 7 Section - Joint Sealants.
 - 4. Division 8 Section - Standard Steel Doors and Frames: Hollow metal frames.
 - 5. Division 9 Section - Tile
 - 6. Division 9 Section - Painting: Field painting.

1.3 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms related to gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 ASSEMBLY PERFORMANCE REQUIREMENTS

- A. Sound Transmission Characteristics: For gypsum board assemblies indicated to have STC ratings, provide materials and construction identical to those of assemblies whose STC ratings were determined per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.

1.5 SUBMITTALS:

A. General:

- 7. Identify proposed changes, differences, and discrepancies, including verbiage, terms, and definitions, between Contract Documents and submittals.

B. LEED Submittals:

- 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.
- 2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
- 3. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured and regionally extracted and manufactured] materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
 - b. Include statement indicating location of manufacturer and point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials. Indicate distance to Project and fraction by weight of each regionally manufactured material that is regionally extracted.
- 4. Product Data for Credit IEQ 4.1: For adhesives used to laminate gypsum board panels to substrates, documentation including printed statement of VOC content.
- 5. Laboratory Test Reports for Credit IEQ 4: For adhesives used to laminate gypsum board panels to substrates, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Product Data:

- 1. For each type of product indicated, submit manufacturer's specifications and other data needed to prove compliance with the specified requirements.

D. Samples:

1. Samples for Verification Purposes:
 - a. 6" x 6" units of each facing material indicated.

E. Quality Control Submittals:

1. Certificates:

- a. Manufacturer's Certificates: Provide product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

8. Manufacturer's Instructions:

- a. Submit manufacturer's recommended installation procedures which, when reviewed by the Architect, may become the basis for accepting or rejecting actual installation procedures used on the work.

F. Contract Closeout Submittals:

9. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Architect requisite copies of the following.
 - a. Project Record Documents.

1.6 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Fire Resistance Ratings: As indicated by reference to GA File Numbers in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer.
- C. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- D. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- E. Field Samples: On actual gypsum board assemblies, prepare field samples of at least 100 sq. ft. in surface area for the following applications. Simulate finished lighting conditions for review of in-place unit of Work.
 - a. Wall surfaces indicated to receive nontextured paint finishes.

- b. Ceiling surfaces indicated to receive nontextured paint finishes.
- c. Surfaces indicated to receive textured finishes specified in this Section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
- C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.8 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

1.9 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials described below matching products installed, packaged with protective covering for storage and identified with labels clearly describing contents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Steel Framing and Furring:
 - a. Alabama Metal Industries Corp.
 - b. Marino Industries Corp.
 - c. Gold Bond Building Products Div., National Gypsum Co.
 - d. Unimast Inc.
 - 2. Gypsum Board and Related Products:

- a. Lafarge North America
- b. Gold Bond Building Products Div., National Gypsum Co.
- c. United States Gypsum Co.
- d. Georgia-Pacific Gypsum.

2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILING

- A. General: Provide components complying with ASTM C 754 for materials and sizes unless otherwise indicated.
- B. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
- D. Steel Studs for Furring Channels: ASTM C 645, with flange edges bent back 90 deg and doubled over to form 3/16-inch minimum lip (return), minimum thickness of base (uncoated) metal and minimum depth as follows:
 1. Thickness: 0.0312 (20-ga.) inch, unless otherwise required for loading.
 2. Depth: as noted on drawings.
 3. Protective Coating (use above ceilings in wet or humid areas): G40 hot-dip galvanized coating per ASTM A 525.
- E. Grid Suspension System for Interior Ceilings (do not use above ceilings in wet or humid areas): ASTM C 645, manufacturer's standard direct-hung grid suspension system composed of main beams and cross furring members that interlock to form a modular supporting network.

2.3 STEEL FRAMING FOR WALLS AND PARTITIONS

- A. General: Provide steel framing members complying with the following requirements:
 1. Component Sizes and Spacings: As indicated but not less than that required to comply with ASTM C 754 under the following maximum deflection and lateral loading conditions:
 - a. Maximum Deflection: L/240 at 5 lb. per sq. ft.
 2. Protective Coating: G40 hot-dip galvanized coating per ASTM A 525.
- B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 deg and doubled over to form 3/16-inch-wide minimum lip (return) and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
 1. Thickness: 20 ga. Minimum or as required to achieve required structural performance for the partition type (L/240 max deflection).
 2. 20-ga. at all framed openings.
 3. Depth: As indicated on drawings.

2.4 FASTENERS

A. Fasteners for Metal Framing, General:

1. Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved.
 - a. Comply with the recommendations of gypsum board manufacturers for applications indicated.
2. Provide steel drill screws complying with ASTM C 1002 for the following applications:
 - a. Fastening gypsum board to steel members less than 0.03 inch thick.
3. Provide steel drill screws complying with ASTM C 954 for the following applications:
 - a. Fastening gypsum board to steel members from 0.033 to 0.112 inch thick.

B. Fasteners for Metal Framing, Ceilings in Wet or Humid Areas:

1. In addition to general fastener requirements, provide fasteners for ceilings in wet or humid areas with organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.
2. Manufacturers of Organic-Polymer-Coated Steel Fasteners:
 - a. "Climaseal," ITW Buildex.
 - b. "Stalgard," Elco Industries, Inc.

2.5 GYPSUM BOARD PRODUCTS

A. General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints.

1. Thickness: Provide gypsum board in thicknesses indicated to comply with ASTM C 840 for application system and support spacing indicated.

B. Products: Subject to compliance with requirements, provide the following gypsum wallboard products:

1. Representative Products:
2.
 - a. National Gypsum: Gold Bond® BRAND Hi-Impact® XP® Gypsum Board with Sporgard:
 - 1). Consists of a tapered edge, mold and moisture resistant, fire-resistant, Type X gypsum core encased in a heavy, abrasion and mold/mildew/moisture resistant, 100% recycled, National Gypsum's original PURPLE® paper on the face side and a heavy, abrasion and mold/mildew/moisture resistant, 100% recycled, gray paper on the back side. A fiberglass mesh is embedded into the core, close to the back of the board to provide additional impact/penetration resistance.
 - b. US Gypsum: USG Sheetrock® Brand - Mold Tough® Vhi Firecode® X Panels

3. Abuse Resistant:
 - a. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 2.
 - b. Core: 5/8 inch (15.9 mm), Type X. 1/4" & 3/8" for curved surfaces.
 - c. Long Edges: Tapered.
 - d. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

4. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board for use on all gypsum ceilings and soffits.
 - a. Thickness: 1/2 inch (12.7 mm).
 - b. Long Edges: Tapered

5. Moisture-and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces. CONTRACTOR'S OPTION: Contractor's option at contractor's expense if building is not yet closed in. Pending Owner/Architect Approval.
 - a. Core: 5/8 inch (15.9 mm), Type X
 - b. Long Edges: Tapered

6. Exterior Gypsum Sheathing: ASTM C1177 and as follows:
 - a. Type: Water-resistant glass mat faced sheathing for use in cavity walls.
 - b. Size: 5/8" (12.7mm) thick by 4' by 8', 9' or 10' (1.9 lb. per square foot).
 - c. Composition: Gypsum sheathing manufactured in accordance with ASTM C 1177 with glass mats both sides and long edges, water-resistant treated core.
 - d. Product: Provide Dens Shield Gold by Georgia Pacific.

7. Exterior Gypsum Sheathing Accessories:
 - a. Joint tape: 2" wide 10x10 glass mesh tape.
 - b. Joint compound: setting-type joint compound.
 - c. Screws, metal framing:
 - 1) Bugle or wafer head, self-tapping, rust-resistant, fine thread for heavy-steel gauge
 - 2) Bugle or wafer head, rust-resistant sharp point, fine thread for light-gauge metal framing or furring.

2.6 GLASS MESH MORTAR UNITS

- A. Proprietary backing units with glass mesh fiber mesh reinforcing and water resistant coating on both faces as backing for all walls with ceramic tile, complying with the following requirements:
 1. Cement-Coated Portland Cement Panels: High density Portland cement surface coating on both faces and lightweight concrete core composed of Portland cement and expanded ceramic aggregate; fabricated in panels 7/16 inch thick by 36 inches wide by 36, 48, or 60, 64, or 72 inches long; and weighing 3.2 - 3.8 lbs per sq. ft.

- B. Products: Subject to compliance with requirements, provide one of the following products:
 1. "Dens-Shield"; Georgia Pacific Corp.

2. "Wonder-Board"; Modulars Inc.
3. "Durock Tile Backer Board"; Durabond Div., USG Industries, Inc.

2.7 TRIM ACCESSORIES FOR GYPSUM WALLBOARD

A. Accessories for Interior Installation: Corner beads, edge trim, Horizontal clips/channels and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal, or metal combined with paper, with metal complying with the following requirement:
 - a. Sheet steel zinc-coated by hot-dip process.
2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. Plastic cornerbead on outside corners, unless otherwise indicated.
 - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
 - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
 - e. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.
 - f. Horizontal Resilient Clips by US Gypsum or horizontal resilient channels by Gold Bond or equal.
 - g. Frye Reglet, Gordon or Pittcon trim piece for drywall reveals where reveals are shown on the drawings. Basis of Design: Pittcon SWR-063-050..

B. Accessories for Interior Ceiling Installation in Wet or Humid Areas: Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Plastic.
2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
 - b. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - c. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.

2.8 ACCESSORIES FOR GYPSUM SHEATHING

1. Gypsum Sheathing Accessories:
 - a. Joint Tape: Joint tape: 2" wide 10 x 10 glass mesh tape.
 - b. Joint Compound: Joint compound: Tough-Rock setting-type joint compound.
 - c. Nails, wood framing: Hot dip, 11-gauge galvanized nails with 7/16" head, 1 1/2" min. length.
 - d. Screws, metal framing:

- 1) Bugle head, self-tapping, rust-resistant, fine thread for heavy-steel gauge.
- 2) Bugle head, rust-resistant sharp point, fine thread for light-gauge metal framing or furring.
- e. Screws, metal or wood framing:
 - 1) Rust-resistant, bugle head, coarse thread, sharp point for wood; or wafer head, rust-resistant screws, drill or sharp point.
- f. Sealants, caulk and tape:
 - 1) Dow Corning 795 or equivalent; Pecora 895 or equivalent.
 - 2) Pecora AC-20 acrylic latex sealant; GE Silicone Silpruf Sealant; Tremco Dymonic or equivalent
 - 3) 2" wide 10 x 10 fiberglass mesh

2.9 JOINT TREATMENT MATERIALS

- A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: Paper reinforcing tape (use at ceiling in wet or humid areas), unless otherwise indicated.
 1. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
- C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
 1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
 - a. Use setting-type joint compound for taping and filling of ceiling in wet or humid areas.
 2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
 3. For topping compound, use sandable formulation.
- D. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
 1. Ready-Mixed Formulation: Factory-mixed product.
 2. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
 3. Topping compound formulated for fill (second) and finish (third) coats.

2.10 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot grouting hollow metal door frames.

- C. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
- D. Vapor Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.
- E. Glass Mesh Mortar Unit Finishing Materials: Tape and joint compounds as recommended by glass mesh mortar unit manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.
 - 1. For ceilings in wet or humid areas, verify that steel support is located @ 12" o.c. maximum.
 - 2. Verify that area above ceiling is vented.
 - 3. Confirm reinforcement locations of heavy wall mounted items and future grab bars.

3.2 PREPARATION

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.

3.3 INSTALLING STEEL FRAMING, GENERAL

- A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.
 - 1. Install supplementary framing and blocking at locations indicated for heavy wall-mounted items.
- C. Isolate steel framing from building structure slab above to prevent transfer of loading imposed by structural movement.
- D. Do not bridge building expansion and control joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.
- E. Install special ceiling construction throughout room in which wet or humid areas occur.

3.4 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

- A. Suspend ceiling hangers from building structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
 - 3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 4. Do not attach hangers to steel deck tabs.
 - 5. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 6. Do not connect or suspend steel framing from ducts, pipes or conduit.
- B. Sway-brace suspended steel framing with hangers used for support.
- C. Install suspended steel framing components in sizes and at spacings indicated but not less than that required by the referenced steel framing installation standard.
 - 1. Wire Hangers: 0.1620-inch (8-gage) diameter, 4 feet o.c.
 - 2. Steel Studs for Furring Channels: 24 inches o.c.
 - a. Ceilings in Wet or Humid Areas: Provide steel studs for furring channels or alternate suspended type support system @ 12 inches o.c.
- D. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring members or grid suspension members are level to within 1/8 inch in 12 feet as measured both lengthwise on each member and transversely between parallel members.

3.5 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS

- A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
 - 1. Where studs are installed directly against exterior walls, install asphalt felt strips between studs and wall.
- B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8 inch from the plane formed by the faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Cut studs 2 inch short of full height. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.

1. For STC-rated and fire-resistive-rated partitions requiring partitions to extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.
 2. Provide horizontal bracing as where necessary to achieve L/240 deflection for all wall partitions, if 20 ga. studs are not sufficient for the span.
- D. Install steel studs and furring in sizes and at spacings indicated but not less than that required by the referenced steel framing installation standard to comply with maximum deflection and minimum loading requirements specified:
1. Typical Construction: Space studs at 16 inches o.c.
 - a. Walls Supporting Heavy Items: Space double studs (back to back) at 12 inches o.c.
- E. Install steel studs so that flanges point in the same direction and so that leading edges or ends of each gypsum board can be attached to open (unsupported) edges of stud flanges first.
1. At walls supporting heavy items, install double studs back to back and screw together at 12 inches o.c.
- F. Frame door openings to comply with details indicated, with GA-219, and with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs. Provide 20 ga. studs at all framed openings.
1. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
 2. Provide GA-219-89, Figure 6 or Figure 7 at all door jambs.
- G. Frame openings other than door openings to comply with details indicated or, if none indicated, in same manner as required for door openings. Install framing below sills of openings to match framing required above door heads.
- H. Provide continuous sheet metal reinforcement for attachment of handrails, grab rails, wood paneling and other items supported by gypsum board assemblies.

3.6 INSTALLING EXTERIOR GYPSUM SHEATHING

- A. Provide Exterior Sheathing where indicated on drawings. Install sheathing in accordance with manufacturer's instructions and applicable instructions in GA-253 and ASTM C 1280.
- B. Install Exterior Sheathing with exterior side out.
- C. Use maximum lengths possible to minimize number of joints.
- D. Attach Exterior Sheathing to metal framing with screws spaced 8" o.c. at perimeter where there are framing supports; and 8" o.c. along intermediate framing in field. A greater number of fasteners may be specified to obtain specific values and is allowed up to 4" o.c. spacing.

3.7 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

- A. Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
- B. Install sound attenuation blankets where indicated prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.
- C. Install ceiling board panels across framing to minimize the number of abutting end joints and avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install wall/partition board panels to minimize the number of abutting end joints or avoid them entirely. Stagger abutting end joints not less than one framing member in alternate courses of board. At stairwells and other high walls, install panels horizontally with end abutting joints over studs and staggered.
- E. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- F. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at corners of framed openings where possible.
 - 1. Do not place cut edges of water resistant gypsum board within 48" of slab.
- G. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- H. Attach gypsum panels to framing provided at openings and cutouts.
- I. Spot grout hollow metal door frames for all doors. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.
- J. Form control joints and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.
- K. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chase walls that are braced internally.
 - 1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels tightly around ducts, pipes, and conduits.
 - 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4-to-1/2-inch-wide joints to install sealant.
- L. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4-inch-to-1/2-inch-wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

- M. Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
- N. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.8 GYPSUM BOARD APPLICATION METHODS

A. Wall Tile Base: Install glass mesh mortar units as base for wall tile.

- 1. In "wet" areas, treat joints to comply with manufacturer's recommendations for type of application indicated.

B. Single-Layer Application: Install gypsum wallboard panels as follows:

- 10. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.
- 11. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide sheet lengths which will minimize end joints.
- 12. On partitions/walls 8'-1" or less in height apply gypsum board horizontally (perpendicular to framing); use maximum length sheets possible to minimize end joints.
- 13. On Z-furring members apply gypsum board vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

C. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:

- 14. Fasten with screws.

D. Double-Layer Application: Install gypsum wall board for base layer and gypsum wallboard for face layer.

- 15. On ceilings apply base layer prior to application of base layer on walls/partitions; apply face layers in same sequence. Offset joints between layers at least 10 inches. Apply base layers at right angles to supports unless otherwise indicated.
- 16. On partitions/walls apply base layer and face layers vertically (parallel to framing) with joints of base layer over supports and face layer joints offset at least 10 inches with base layer joints.
- 17. On Z-furring members apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
- 18. Provide either V-joint type backing board or tape and finish joints to produce a flat surface.

E. Double-Layer Fastening Methods: Apply base layer of gypsum panels and face layer to base layer as follows:

- 19. Fasten both base layers and face layers separately to supports with screws.

F. Ceilings in Wet or Humid Areas: Apply gypsum board panels perpendicular to supports, with end joints staggered over supports. Install with 1/4-inch open space where panels abut other construction or structural penetrations.

- 20. Fasten with corrosion-resistant screws spaced @ 6" o.c.
- 21. Use 5/8" proprietary fire-resistive-rated type gypsum board panels.

G. Exterior Soffits and Ceilings: Apply exterior gypsum soffit board panels perpendicular to supports, with end joints staggered over supports. Install with 1/4-inch open space where panels abut other construction or structural penetrations.

3.9 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install corner beads at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed or semiexposed. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.
 - 22. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
 - 23. Install L-bead where edge trims can only be installed after gypsum panels are installed.
 - 24. Install U-bead where indicated.
 - 25. Install aluminum reveal trim and other accessories where indicated.
- D. Install control joints at locations indicated, and where not indicated according to ASTM C 840, and in locations approved by Architect for visual effect. Provide control joints at 30' o/c max. Control joints to occur over doorways or at column cover inside corners wherever possible.

3.10 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
 - 1. Apply joint treatment to each layer of double layer assemblies.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints except those with trim accessories having concealed face flanges not requiring taping to prevent cracks from developing in joint treatment at flange edges.
- D. Apply joint tape over gypsum board joints and to trim accessories with concealed face flanges as recommended by trim accessory manufacturer and as required to prevent cracks from developing in joint compound at flange edges.
- F. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
 - 1. Level 1 for ceiling plenum areas, concealed areas, inner layer of double layer assemblies, and where indicated, unless a higher level of finish is required for fire-resistive-rated assemblies and sound-rated assemblies.

2. Level 3 for gypsum board surfaces indicated to receive wood paneling.
 3. Level 4 for gypsum board surfaces indicated to receive light-textured finishes, wallcoverings, and flat paints over light textures.
 4. Level 5 for gypsum board surfaces in the LOBBY. Use non-textured flat paints.
- G. For level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories using one of the following combinations of joint compounds (not including prefill), and sand between coats and after last coat.
- H. Where level 5 gypsum board finish is indicated, apply joint compound combination specified for level 4 plus a thin, uniform skim coat of joint compound over entire surface. Use joint compound specified for the finish (third coat) or a product specially formulated for this purpose and acceptable to gypsum board manufacturer. Produce surfaces free of tool marks and ridges ready for decoration of type indicated.
 - I. Where level 1 gypsum board finish is indicated, apply joint compound specified for embedding coat.

3.11 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer, that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 29 00

SECTION 09 29 50 - GYPSUM BOARD SHAFT-WALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Shaft enclosures.
 - 2. Chase enclosures.
 - 3. Horizontal shaft wall enclosures.
- B. Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board Assemblies".

1.3 SUBMITTALS

- A. Product Data: For each gypsum board shaft-wall assembly indicated.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
 - 3. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured and regionally extracted and manufactured] materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.

b. Include statement indicating location of manufacturer and point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials. Indicate distance to Project and fraction by weight of each regionally manufactured material that is regionally extracted.

4. Product Data for Credit IEQ 4.1: For adhesives used to laminate gypsum board panels to substrates, documentation including printed statement of VOC content.

5. Laboratory Test Reports for Credit IEQ 4: For adhesives used to laminate gypsum board panels to substrates, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Fire-Test-Response Reports:

1. Include data substantiating that elevator entrances and other items that penetrate each gypsum board shaft-wall assembly do not negate fire-resistance rating.

D. Research/evaluation reports.

E. Acoustical-test-response reports.

1.4 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

B. STC-Rated Assemblies: For gypsum board shaft-wall assemblies indicated to have STC ratings, provide assembly materials and construction complying with requirements of assemblies whose STC ratings were determined according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: The design for gypsum board shaft-wall assemblies is based on products named on Drawings by design designation of a qualified testing and inspecting agency. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. American Gypsum Co.
2. G-P Gypsum Corp.
3. National Gypsum Company.
4. United States Gypsum Co.

2.2 MATERIALS AND COMPONENTS

- A. General: Comply with requirements of fire-resistance-rated assemblies indicated.
 - 1. Provide panels in maximum lengths available to eliminate or minimize end-to-end butt joints.
 - 2. Provide auxiliary materials complying with gypsum board shaft-wall assembly manufacturer's written recommendations.
- B. Steel Sheet Components: Metal complying with ASTM C 645 requirements.
 - 1. Protective Coating: ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized coating.
- C. Studs: Manufacturer's standard profile for repetitive members and corner and end members and for fire-resistance-rated assembly indicated.
 - 1. Depth: as indicated in partition types.
 - 2. Minimum Base Metal Thickness: 0.0312 inch (20 gauge).
- D. Track (Runner): Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, in depth matching studs.
 - 1. Minimum Base Metal Thickness: same as stud.
- E. Jamb Struts: Manufacturer's standard J-profile strut with long-leg length of 3 inches (76.2 mm), in depth matching studs, and not less than 0.0341 inch (0.87 mm) thick.
- F. Gypsum Liner Panels: Manufacturer's proprietary liner panels in 1-inch (25.4-mm) thickness and with moisture-resistant paper faces.
- G. Gypsum Wallboard: ASTM C 36, core type as required by fire-resistance-rated assembly indicated.
 - 1. Edges: Tapered.
- H. Accessories: Cornerbead, edge trim, and control joints of material and shapes specified in Division 9 Section "Gypsum Board Assemblies" that comply with gypsum board shaft-wall assembly manufacturer's written recommendations for application indicated.
- I. Gypsum Wallboard Joint-Treatment Materials: ASTM C 475 and as specified in Division 9 Section "Gypsum Board Assemblies."
- J. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- K. Track (Runner) Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.

1. Powder-Actuated Fasteners: Provide powder-actuated fasteners with capability to sustain, without failure, a load equal to 10 times that imposed by shaft-wall assemblies, as determined by testing conducted by a qualified independent testing agency according to ASTM E 1190.
 2. Postinstalled Expansion Anchors: Where indicated, provide expansion anchors with capability to sustain, without failure, a load equal to 5 times that imposed by shaft-wall assemblies, as determined by testing conducted by a qualified independent testing agency according to ASTM E 488.
- L. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants.
- M. Sound Attenuation Blankets: ASTM C 665 for Type I, unfaced mineral-fiber-blanket insulation produced by combining thermosetting resins with mineral fibers manufactured from slag or rock wool.
- 2.3 HORIZONTAL SHAFT WALL ENCLOSURE SYSTEMS
- A. General: Horizontal Shaft Wall Assembly Requirements: The shaft wall assembly for system(s) shown must have following additional attributes:
1. Must be UL Classified.
 2. Must have been used in successful tests of all major elevator manufacturers' frames and doors at Underwriters Laboratories.
 3. NESC Report: Submit National Evaluation Service Committee of the Council of American Building Officials Report No. NER 258 as evidence of compliance of systems shown with codes of council members.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Sprayed Fire-Resistive Materials: Coordinate with gypsum shaft-wall assemblies so both elements of Work remain complete and undamaged.
- B. Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
1. ASTM C 754 for installing steel framing.
 2. Division 9 Section "Gypsum Board Assemblies" for applying and finishing panels.
- C. Do not bridge building expansion joints with shaft-wall assemblies; frame both sides of joints with furring and other support.
- D. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.

1. Where handrails directly attach to gypsum board shaft-wall assemblies, provide galvanized steel reinforcing strip with 0.0312-inch (minimum thickness of base (uncoated) metal, accurately positioned and secured behind at least 1 face-layer panel.
- E. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- F. Isolate gypsum finish panels from building structure to prevent cracking of finish panels while maintaining continuity of fire-rated construction.
- G. Install control joints to maintain fire-resistance rating of assemblies.
- H. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with manufacturer's written instructions or ASTM C 919, whichever is more stringent.

END OF SECTION 09 29 50

SECTION 09 31 00 - CERAMIC TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Porcelain Wall Tile
 - 2. Glazed Wall Tile
 - 3. Metal edge strips installed as part of tile installations.
- B. Related Sections include the following:
 - 1. Division 7 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 2. Division 9 Section "Gypsum Board Assemblies" for substrates for ceramic tile.

1.3 DEFINITIONS

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.
- B. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.4 PERFORMANCE REQUIREMENTS

- A. A. Dynamic Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ANSI 137.1, section 9.6:
 - 1. Level Surfaces: DCOF 0.42 Wet.
- B. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum 0.6 Wet & Dry.

1.5 SUBMITTALS

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

- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least 12 inches (300 mm) square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work.
 - 3. Full-size units of each type of trim and accessory for each color and finish required.
 - 4. Metal edge strips in 6-inch (150-mm) lengths.
- E. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- F. Product Certificates: For each type of product, signed by product manufacturer.
- G. Qualification Data: For Installer.
- H. Material Test Reports: For each tile-setting and -grouting product.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain all tile from one source or producer.
 - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
 - 1. Joint sealants.
 - 2. Metal edge strips.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
 - 1. Meeting Agenda to include, but is not limited to:
 - a. Tile and installation material compatibility.
 - b. Grouting Procedure.
 - c. Surface Preparation.
 - d. Maintenance and cleaning products and methods.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store liquid latexes in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
 2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.
- C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
1. As selected by Architect from manufacturer's full range.
- D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
- F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.3 TILE PRODUCTS

- A. Available Manufacturers:
1. American Olean
 2. Crossville, Inc., Basis of Design
 3. Daltile; Div. of Dal-Tile International Inc.
 4. Johnson Tiles, Basis of Design
 5. Royal Mosa
- B. **CT-1** Porcelain Stone Tile: Wall Field Tile
1. Manufacturer: Crossville, (Basis of Design).
 2. Product: Empire
 3. Number: VS 75
 4. Color: Cadet White - Polished
 5. Nominal Module Size: 12 by 24 inches.
 6. Actual Size: 297 x 597 mm
 7. Thickness: 7/16 inch. (10.5 mm)
 8. Distributed by Garden State Tile – Jenny Wawrzyniak (717) 917-7110
 9. Location: Corridor Wainscot Field Tile
- C. **CT-1A** Porcelain Stone Tile: Wall Bullnose Tile
1. Manufacturer: Crossville, (Basis of Design).

2. Product: Empire
3. Number: VS 75
4. Color: Cadet White - Polished
5. Nominal Module Size: 4 by 24 inches.
6. Actual Size: 96 x 597 mm
7. Thickness: 7/16 inch. (10.5 mm)
8. Distributed by Garden State Tile – Jenny Wawrzyniak (717) 917-7110
9. Location: Corridor Bull Nose Wainscot Cap Tile

D. **CT-2** Glazed Ceramic Wall Tile: Wall Field Tile

1. Manufacturer: Johnson Tiles, (Basis of Design).
2. Product: Prismatics
3. Number: TBD
4. Color: To be selected by Architect, Full Range of Colors.
5. Nominal Module Size: 4 by 8 inches.
6. Actual Size: 100 mm x 200 mm.
7. Thickness: 1/4 inch. (6.5 mm)
8. Distributed by Garden State Tile – Jenny Wawrzyniak (717) 917-7110
9. Location: Public Restroom Field Tile

E. **CT-2A** Glazed Ceramic Wall Tile: Wall Accent Tile

1. Manufacturer: Johnson Tiles, (Basis of Design).
2. Product: Prismatics
3. Number: TBD
4. Color: To be selected by Architect, Full Range of Colors.
5. Nominal Module Size: 4 by 8 inches.
6. Actual Size: 100 mm x 200 mm.
7. Thickness: 1/4 inch. (6.5 mm)
8. Distributed by Garden State Tile – Jenny Wawrzyniak (717) 917-7110
9. Location: Public Restroom & Corridor Accent

F. **CT-3 A,B,C** Glazed Ceramic Wall Tile: Wall Accent Tile

1. Manufacturer: Johnson Tiles, (Basis of Design).
2. Product: Prismatics
3. Number: TBD
4. Color: To be selected by Architect, Full Range of Colors.
5. Nominal Module Size: 4 by 4 inches.
6. Actual Size: 100 mm x 100 mm.
7. Thickness: 1/4 inch. (6.5 mm)
8. Distributed by Garden State Tile – Jenny Wawrzyniak (717) 917-7110
9. Location: Public Restroom Accent Tile

G. **CT-4** Glazed Ceramic Wall Tile: Wall Field Tile

1. Manufacturer: Johnson Tiles, (Basis of Design).
2. Product: Prismatics
3. Number: TBD

4. Color: To be selected by Architect, Full Range of Colors.
5. Nominal Module Size: 6 by 6 inches.
6. Actual Size: 150 mm x 150 mm.
7. Thickness: 1/4 inch. (6.5 mm)
8. Distributed by Garden State Tile – Jenny Wawrzyniak (717) 917-7110
9. Location: Children’s Restroom Field Tile

H. **CT-4 A,B** Glazed Ceramic Wall Tile: Wall Accent Tile

1. Manufacturer: Johnson Tiles, (Basis of Design).
2. Product: Prismatics
3. Number: TBD
4. Color: To be selected by Architect, Full Range of Colors.
5. Nominal Module Size: 6 by 6 inches.
6. Actual Size: 150 mm x 150 mm.
7. Thickness: 1/4 inch. (6.5 mm)
8. Distributed by Garden State Tile – Jenny Wawrzyniak (717) 917-7110
9. Location: Children’s Restroom Accent Tiles

2.4 SETTING AND GROUTING MATERIALS

A. Available Manufacturers:

1. Custom Building Products.
2. Bonsal, W. R., Company.
3. Bostik.
4. DAP, Inc.
5. LATICRETE International Inc.
6. MAPEI Corporation, (Basis of Design).

B. ANSI A118.4, ANSI A118.1, See Evaluations for difference between normal and nonsagging mortar.

1. For wall applications, provide nonsagging mortar that complies with Paragraph C-4.6.1 in addition to the other requirements in ANSI A118.1.

C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:

1. Prepackaged dry-mortar mix combined with styrene-butadiene-rubber liquid-latex additive.
 - a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.

D. Premium non-sag, medium-bed and thin-set mortar: Polymer-modified single-component mortar for large format tile ", complying with ANSI A118.4, A118.11 and ISO 13007 C2TES1P1; MAPEI "Ultraflex LFT", Basis of Design.

- E. Fast Setting Sanded Polymer-Modified Grout, Complying with ANSI A118.6, ANSI A118.7 and ISO 13007 CG2WAF, for joints between 1/16 inch and 1 inch (1,5 mm and 25 mm) wide; MAPEI "Ultracolor Plus"; Basis of Design, Full Range of Colors to be selected by Architect.
- F. Standard Unsanded Cement Grout: ANSI A118.6, color as selected by Architect from manufacturer's full range.
- G. Polymer-Modified Tile Grout: ANSI A118.7, color as selected by Architect from manufacturer's full range.
- H. Water-Cleanable Epoxy Grout: ANSI A118.3[, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D, color as selected by Architect from manufacturer's full range.

2.5 SURFACE PREPARATION MATERIALS

- A. Reduced-preparation, self-leveling underlayment for smoothing and repairing interior floors before the installation of floor coverings from feather edge to up to 2" (5 cm).; MAPEI, "Ultraplan Easy"; Basis of Design.
 - 1. Requires MAPEI "Primer T".
- B. Cementitious Patching Compound; MAPEI, "Mapecem Quickpatch"; Basis of Design

2.6 CRACK ISOLATION AND WATERPROOFING MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated.
- B. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 3/16-inch (4-mm) nominal thickness.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Schluter Systems L.P.; DITRA.
 - b. Premium Latex Based Waterproofing and Crack Isolation Membrane; fast setting, flexible, thin, load-bearing, waterproofing membrane system consisting of a premixed, quick-drying liquid latex, for installation under ceramic tile or complying with ANSI A118.10 and ANSI A118.12; and having IAMPO certification as a shower pan liner; MAPEI, "AquaDefense", Basis of Design.
 - c. Premixed, liquid-rubber, quick-drying crack-isolation membrane for installation under ceramic tile or stone in residential and commercial interior and exterior environments complying with ANSI A118.12; MAPEI, "Mapelastc CI"; Basis of Design.

2.7 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 7 Section "Joint Sealants."
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
 - 1. Available Products:
 - a. Dow Corning Corporation; Dow Corning 786.
 - b. GE Silicones; Sanitary 1700.
 - c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
 - d. Tremco, Inc.; Tremsil 600 White.

2.8 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications, white zinc alloy exposed-edge material.
- C. Temporary Protective Coating: Product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - 1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.
 - 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- E. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

2.9 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors installed with [adhesives] [or] [thin-set mortar] that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

- D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."
- H. Grout tile to comply with requirements of the following tile installation standards:
 - 1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.
 - 2. For chemical-resistant epoxy grouts, comply with ANSI A108.6.
 - 3. For chemical-resistant furan grouts, comply with ANSI A108.8.
- I. Install cementitious backer units and treat joints to comply with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 WALL TILE INSTALLATION

- A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.
- B. Joint Widths: Install tile on walls with the following joint widths:
 - 1. Porcelain Stone Tile: 3/16 inch.
 - 2. Glazed Wall Tile: 1/16

3.5 TILE BACKING PANEL INSTALLATION

- A. Install cementitious backer units and fiber-cement underlayment and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.6 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.7 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.8 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove latex-portland cement grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09 31 00

SECTION 09 51 23 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes:
 - 1. Acoustical ceiling panels.
 - 2. Acoustical ceiling framing systems.
 - 3. Extruded aluminum perimeter framing for suspended cloud ceilings.
 - 4. Concealed and exposed suspension systems for ceilings.

1.3 DEFINITIONS

- A. AC: Articulation Class.
- B. CAC: Ceiling Attenuation Class.
- C. LR: Light Reflectance coefficient.
- D. NRC: Noise Reduction Coefficient.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Ceiling suspension members.
 - 2. Method of attaching hangers to building structure.
 - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 4. Minimum Drawing Scale: 1/8 inch = 1 foot.
- C. Samples for Initial Selection: For components with factory-applied color finishes.

- D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of 6-inch- square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- long Samples of each type, finish, and color.

1.5 QUALITY ASSURANCE

- A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.
- B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 - 1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
 - b. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 2. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

2.2 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.
- B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 PANELS FOR ACOUSTICAL TILE CEILINGS:

- A. Manufacturers:
 - 1. USG Building Systems
 - a. Contact Information: Sandy Mulkern, CSI, Industry IIDA, USG Regional Manager (617) 697-5156

2. Armstrong World Industries
 - a. Contact Information: Meredith Baxter, Armstrong Sales Manager (484)- 888-2353
3. Certain Teed Ceilings
4. Celotex

B. Basis of Design Products:

1. ACT-1 USG Corporation; Radar Education High NRC Acoustical Panels- 2x4, Square Lay-In, 24 by 48 inch. Product number 22441 Class A. 15/16" DX/DXL Grid System.
2. ACT-2 USG Corporation; Radar Education High NRC Acoustical Panels - 2x2, Square Lay-In, 24 by 24 inch. Product number 22421 Class A. 15/16" DX/DXL Grid System.
3. ACT-3 Armstrong World Industries, Inc.; Optima – 4 x 4 x 7/8, 48 by 48 inches. Product number 3909. 15/16" Prelude Grid System.
4. ACT-4 USG, Inc.; Sheetrock Brand Lay-In Clima Plus Performance - 2x4, Square Lay-In 24 by 48 inch. Product number 3270. 15/16" DX/DXL Grid System.

C. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:

1. ACT-1 (Radar Education Acoustical Panels #22441 - Classrooms)
2. Type and Form: Type III, Wet-formed mineral fiber with factory applied vinyl latex painted finish; Form 2, pattern C E.
 - a. Color: White
 - b. LR: Not less than 0.84
 - c. NRC: Not less than 0.70
 - d. CAC: Not less than 40
 - e. Edge Detail: Square – reveal sized to fit flange of exposed suspension system members
 - f. Thickness: 7/8 inch
 - g. Size: 24 by 48 inches
 - h. Fire Class A

D. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:

1. ACT-2 (Radar Education Acoustical Panels #22421 - Corridors)
2. Type and Form: Type III, Wet-formed mineral fiber with factory applied vinyl latex painted finish; Form 2, pattern C E.
 - a. Color: White
 - b. LR: Not less than 0.84
 - c. NRC: Not less than 0.70
 - d. CAC: Not less than 35
 - e. Edge Detail: Square – reveal sized to fit flange of exposed suspension system members
 - f. Thickness: 7/8 inch
 - g. Size: 24 by 24 inches
 - h. Fire Class A

- E. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
1. ACT-3 (Armstrong Optima Acoustical Panels #3909) – First & Second Level Lobby Tech Zone Ceilings & Cloud
 2. Type and Form: Type XII, Fiberglass with DuraBrite acoustically transparent membrane. CAC Backing; Factory applied latex paint; Form 2, pattern E.
 - a. Color: White
 - b. LR: Not less than 0.90
 - c. NRC: Not less than 0.90
 - d. CAC: N/A
 - e. Edge Detail: Vector – reveal sized to fit flange of exposed suspension system members
 - f. Thickness: 7/8 inch
 - g. Size: 48 by 48 inches
 - h. Fire Class A
- C. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
1. ACT-4 (Sheetrock Brand w/ Clima Plus #3270) Kitchen Area
 2. Type and Form: Type XX, Wet-formed mineral fiber with factory applied vinyl laminated face with sealed back and edges, pattern G.
 - a. Color: White.
 - b. LR: Not less than 0.77
 - c. NRC: N/A
 - d. CAC: Not less than 40
 - e. Edge Detail: Square Lay In – reveal sized to fit flange of exposed suspension system members.
 - f. Thickness: 1/2 inch.
 - g. Size: 24 by 48 inches.
 - h. Class A

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
1. Zinc-Coated Carbon-Steel Wire: ASTM A 641, Class 1 zinc coating, soft temper.
 2. Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.

3. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.
- D. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

2.5 METAL SUSPENSION SYSTEM FOR STANDARD TILE ACOUSTICAL PANEL CEILINGS

- A. Products:
1. USG Corporation; DX/DL 15/16" exposed tee grid for Acoustical Panel Ceilings.
 2. Armstrong Ceilings: Prelude 15/16" exposed tee grid for Acoustical Panel Ceilings.
- B. Wide-Face, Capped, Double-Web, Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653, not less than G30 coating designation, with prefinished 15/16-inch-wide metal caps on flanges.
1. Structural Classification: Heavy -duty system.
 2. End Condition of Cross Runners: Butt-edge type.
 3. Face Design: Flat, flush.
 4. Cap Material: Steel cold-rolled sheet.
 5. Cap Finish: Painted.

2.6 METAL SUSPENSION SYSTEM FOR TECHZONE ACOUSTICAL PANEL CEILING.

- A. Products:
1. Techzone
 2. Ceiling Module: 4'-0"
 3. On Center Spacing: 8'-4"
 4. Field Panel: Optima Vector Panels with 1/4" Reveal – #3909 - 48" x 48"
 5. Technical Panels: Optima Vector Panels with 1/4" Reveal – #1466 - 6" x 48"
 6. Grid: 15/16" Prelude
 7. Color: White
 8. Location: First and Second Floor Lobbies
- B. Wide-Face, Capped, Double-Web, Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653, not less than G30 coating designation, with prefinished 15/16-inch-wide metal caps on flanges.
1. Structural Classification: Heavy -duty system.
 2. End Condition of Cross Runners: Butt-edge type.
 3. Face Design: Flat, flush.
 4. Cap Material: Steel cold-rolled sheet.
 5. Cap Finish: Painted.

2.7 METAL SUSPENSION SYSTEM FOR CLOUD TYPE ACOUSTICAL PANEL CEILING.

A. Products:

1. Formations Curves
2. Panels: Kit 3975 - Optima Vector Factory-Cut Curved Panels with Axiom Vector Trim.
3. Size: 11'-5" Circle
4. Axiom Vector Trim: 6" Height
5. Suspension Kit: C6-VES1212C-WH
6. Grid: 15/16" Prelude
7. Color: White
8. Location: Second Floor Elevator Lobby

B. Wide-Face, Capped, Double-Web, Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653, not less than G30 coating designation, with prefinished 15/16-inch-wide metal caps on flanges.

1. Structural Classification: Heavy -duty system.
2. End Condition of Cross Runners: Butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Steel cold-rolled sheet.
5. Cap Finish: Painted.

2.8 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers:

1. Armstrong World Industries, Inc., Basis of Design.
2. Celotex Corporation; Architectural Ceilings Marketing Dept.
3. Chicago Metallic Corporation.
4. USG Interiors, Inc., Basis of Design

B. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

1. For lay-in panels with reveal edge details, use standard edge moulding and kerf tile to reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
3. For narrow-face suspension systems, provide suspension system and manufacturer's standard edge moldings that match width and configuration of exposed runners.

C. Extruded aluminum Edge Mouldings: Provide manufacturer's product in profile indicated on Drawings, or if not indicated provide minimum 8" height fascia profile.

2.9 ACOUSTICAL SEALANT

- A. Products:
1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corp; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
 2. Acoustical Sealant for Concealed Joints:
 - a. OSI Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.
 - b. OSI Sealants, Inc.; Pro-Series SC-175 Rubber Base Sound Sealant.
 - c. Pecora Corp.; BA-98.
 - d. Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION, GENERAL

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 3. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 6. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 7. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 8. Do not attach hangers to steel deck tabs.
 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. Arrange directionally patterned acoustical panels as follows:

- a. As indicated on reflected ceiling plans.
2. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
3. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 23

SECTION 09 51 50 – WOOD VENEER ACOUSTICAL WALL PANEL SYSTEM (STAGEFRONT)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. All work shall be performed in accordance with the manufacturer's instructions, and in a manner satisfactory to the owner's representative.

1.01 SCOPE

Manufacturer shall furnish all panel assemblies necessary to complete installation by the contractor, in accordance with plans and specifications.

1.02.1 RELATED WORK NOT INCLUDED UNDER THIS SECTION

- A. Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:
 - 1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
 - 2. Suspension systems and components for walls other than the manufacturer's acoustic wall system are not included.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: The installer shall be a firm with a minimum of two (2) years of successful experience in installation of products with similar requirements to this project. The installer shall be acceptable to the architect, manufacturer, and owner's representative.
- B. Fire Performance Characteristics: Acoustical Wall Panels shall conform to Class 1, or A flame spread rating, when tested according to ASTM E-84.
- C. Environmental Standards: Veneer panels components shall originate from well managed forests as certified by the Forestry Stewardship council. Manufacturer shall provide a chain of custody certificate at time of Bid. Wood core to have no added urea formaldehyde.

1.03 PROJECT CONDITIONS

- A. Installation shall be done only when the temperature and humidity closely approximate the interior conditions that will exist when the building is occupied. The heating and cooling systems shall be operating before, during, and after installation, with the humidity of the interior spaces maintained between 25% and 55%. It is important that area have proper ventilation, especially in high moisture areas. There shall be no excessive build up of heat in the space.
- B. Prior to the start of installation, all exterior windows and doors are to be in place, glazed, and weather-stripped. The roof is to be watertight, and all wet trades' work is to be completed, and thoroughly dry.
- C. Mechanical, electrical, and other utility service installations behind the wall plane shall have been completed. No materials should rest or wrap around, the wall suspension components.

1.05 COORDINATION OF WORK

The layout and installation of Rulon Aluratone Wood Veneer Acoustical Wall Panels shall be coordinated with other work penetrating the wall.

1.06 SUBMITTALS

- A. Product Data: Manufacturer shall provide product specifications and installation instructions for all supplied materials.
- B. LEED Submittals:
 - 1. Product Data for Credit EQ 4.4:
 - a. For each composite-wood product used, documentation indicating that the bonding agent contains no urea formaldehyde.
 - b. For each adhesive used, documentation indicating that the adhesive contains no urea formaldehyde.
 - 2. Product Data for Credit(s) MR 4.1 and MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content
 - a. Include statement indicating costs for each product having recycled content.
 - 3. Certificates for Credit MR 7: Chain-of-custody certificates certifying that products specified to be made from certified wood comply with forest certification requirements. Include evidence that mill is certified for chain of custody by an FSC-accredited certification body.
 - a. Include statement indicating costs for each certified wood product.
- C. Shop Drawings: Manufacturer shall supply shop drawings showing Acoustic Wood Veneer Wall Panel sizes and locations, and other details deemed pertinent to proper installation.
- D. Samples: A 12"x12" inch sample, with finish applied, shall be submitted for approval.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Acoustical Wall Panel assemblies shall be delivered to the project site in original, unopened packages.
- B. Wall Panels shall be stored in a fully enclosed space. For a minimum of seventy-two (72) hours immediately prior to the wall installation, the Rulon Wall Panels shall be stored in the room in which they will be installed. The temperature and humidity of the room shall closely approximate those conditions that will exist when the building is occupied. The Rulon Wall Panels shall be stored off the floor.
- C. Care in handling must be exercised to avoid damage.

1.08 WARRANTIES

- A. Manufacturer: All materials supplied by the Wall Panel manufacturer shall be guaranteed against manufacturing defects for one (1) year. Because of differing site conditions, wood stains and colorings can vary with age, and are excluded from this warranty.
- B. Contractor: All work shall be guaranteed for one (1) year from final acceptance of completed work.

PART 2 - PRODUCT

2.01 WALL PANELS

- A. Basis of Design: Aluratone 900 acoustic wood wall systems covered by this specification shall be the products of the Rulon Company, World Commerce Center, 2000 Ring Way Road, St. Augustine, FL 32092 PH-1-800-227-8566. Rulon Company, www.rulonco.com,
- B. Equal product by:
 - 1. RPG Diffuser Systems, Inc. <http://www.rpginc.com/>
 - 2. Toppakustic, Wood Ceilings Inc.; www.woodceilings.com
- C. Description:
 - 1. Panels are manufactured in nominal widths of 4', in lengths up to 10'. The Rulon Aluratone Acoustical Wall Panels will be made with a maple face veneer, Plain Sliced, bookmatched, applied to a 3/4" thick core material with vertical "U" grooved face scoring at 6 inch centers. The back of the 3/4" material is drilled so that the intersection of the face grooves and back holes will create openings through the panel.
 - 2. Acoustical absorptive black backing is applied in the factory.

2.02 INSTALLATION SYSTEMS

The wall panels can be made with tongue and groove edges for interconnecting to each panel, or edge banded for applications where reveals between panels are designed.

2.03 EDGES, BORDERS, AND PERIMETER TRIMS

Edges, borders and perimeter trims shall be designated by the specifier in accordance with standard design details available. All wood wall products specified shall be supplied by the wall manufacturer.

2.04 FINISHES AND COLORS

The Acoustical Panel wood veneer panel face and edge surfaces shall be factory-finished with Ultra-Low VOC, water based, UV hardened clear sealers, wood stains, or semi-transparent color treatments to match architects sample.

A clear finish is applied to the back side of panels.

Wood is a natural product with variations in grain, texture and color – often ranging from light to dark – thereby affecting the surface look. Product finishes shall be stain or sealer coats – spray applied to a smooth sanded surface.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Wall Layout: If required, prior to manufacture, field dimensions shall be taken to determine Panel sizes. The contractor shall measure applicable areas prior to installation to confirm application and location of Panel supports, in accordance with installation instructions.
- B. Coordination: The contractor shall coordinate with other trades the location of devices which will penetrate the Wall Panels of interfere with the installation. Recessed or surface devices located within the wall panels are to be located and cut in the field.

3.02 INSTALLATION

General: The contractor shall install materials in accordance with Rulon Company printed instructions and architect's drawings. The installation shall comply with applicable regulations and industry standards.

3.03 ADJUSTMENT, CLEANING, AND REPAIR

- A. The contractor shall make final adjustments to level or contours.
- B. Upon completion of installation, all Rulon Acoustical Wall Panels shall be cleaned free of dirt, dust, grease, oils, and fingerprints.
- C. All work which cannot be successfully cleaned or repaired shall be removed and replaced.

3.05 INSPECTION

Upon completion of installation, the owner's representative shall inspect all finished surfaces to ensure that work has been performed in a manner satisfactory to the owner. Any deficiencies in the installed Wall Panels shall be corrected by the contractor at no additional cost to the owner, or to the manufacturer.

END OF SECTION 09 51 50

SECTION 09 64 00 – NEW WOOD FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes wood flooring.

1.2 ACTION SUBMITTALS

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

- B. LEED Submittals:

1. Certificates for Credit MR 6 and Credit MR 7: Chain-of-custody certificates certifying that products specified to be made from certified wood comply with forest certification requirements. Include evidence that mill is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.
2. Product Data for Credit IEQ 4.1: For wood flooring installation adhesives, documentation including printed statement of VOC content.
3. Product Data for Credit IEQ 4.2: For field-applied finishes for wood flooring, documentation including printed statement of VOC content.
4. Product Data for Credit IEQ 4.3: For wood flooring installation adhesives and field-applied finishes for wood flooring, documentation including printed statement of VOC content.
5. Product Data for Credit IEQ 4.3: For wood flooring, documentation from an independent testing agency indicating compliance with the FloorScore Standard.
6. Product Data for Credit IEQ 4.4: For composite wood products, documentation indicating that the bonding agent contains no urea formaldehyde.
7. Laboratory Test Reports for Credit IEQ 4: For adhesives, finishes, flooring system elements, and composite wood products , documentation indicating that products comply with California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

- C. Samples: For each type of wood flooring and accessory.

1.3 QUALITY ASSURANCE

- A. Hardwood Flooring: Comply with NOFMA's "Official Flooring Grading Rules" for species, grade, and cut.
- B. Maple Flooring: Comply with applicable MFMA grading rules for species, grade, and cut.
- C. Softwood Flooring: Comply with WCLIB No. 17 grading rules for species, grade, and cut.

- D. Build mockup of typical flooring area as shown on Drawings [**including base and shoe moldings**].

1.4 PROJECT CONDITIONS

- A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.
 - 1. Environmental Conditioning: Maintain an ambient temperature between 65 and 75 deg F (18 and 24 deg C) and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.
 - 2. Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.
 - a. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.
 - b. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.
- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
- C. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. FloorScore Compliance: Wood floors shall comply with requirements of FloorScore Standard.
- B. Low-Emitting Materials: Wood flooring systems shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 WOOD FLOORING

- A. Certified Wood: Provide wood flooring produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- B. Solid-Wood Flooring: Kiln dried to 6 to 9 percent maximum moisture content, tongue and groove and end matched, and with backs channeled.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Acer Flooring, LLC.
 - b. Anderson Hardwood Floors.
 - c. Armstrong World Industries, Inc.
 - d. Bellawood.
 - e. Carlisle Wide Plank Floors.
 - f. EcoTimber.
 - g. International Hardwood Flooring, Inc.
 - h. Kentucky Wood Floors.
 - i. Miller and Company, Inc.
 - j. Oregon Lumber Company.
 - k. Sandy Pond Hardwoods, Inc.
 - l. WD Flooring, LLC.
 - m. Yesteryear Floorworks Company.
2. Species and Grade: MFMA-RL First Grade hard maple, plain sawn.
 3. Thickness: 3/4 inch (19 mm).
 4. Face Width: 2-1/4 inches or 3-1/8 inches.
 5. Lengths: Manufacturer's standard]
 6. Finishing: Field or Factory.

2.3 FIELD FINISHING

- A. Finish System: Conversion varnish. Complete system of compatible components that is recommended by finish manufacturer for application indicated.
 1. VOC Content: When calculated according to 40 CFR 59, Subpart D (EPA Method 24), as follows:
 - a. Finish Coats and Floor Sealers: Not more than 350 g/L.
 - b. Stains: Not more than 250 g/L.
 2. Finish system materials shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 3. Stain: Penetrating and nonfading type.
 - a. Color: Clear.
 - b. Finish system: See Specification Section 09 90 00 for AWI System #TR-4, Conversion Varnish with clear natural finish. Class A Flame Spread, Class 1 Finish Fire Rating.
 4. Floor Sealer: Pliable, penetrating type.
 5. Finish Coats: Formulated for multicoat application on wood flooring.
- B. Wood Filler: Compatible with finish system components.

2.4 FACTORY FINISHING

- A. Finish: AWI System #TR-4, Conversion Varnish with clear natural finish. Class A Flame Spread, Class 1 Finish Fire Rating.

1. Color: Clear.

2.5 SOUND CONTROL UNDERLAYMENT

- A. Sound Control Underlayment: Minimum Impact Insulation Class (IIC) of **55** when tested according to ASTM E 492.
 1. Material: Options include Recycled rubber, [Wood fiber made with binder containing no urea formaldehyde.
 2. Thickness: 3/4 inch.

2.6 ACCESSORY MATERIALS

- A. Asphalt-Saturated Felt: ASTM D 4869, Type II.
- B. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.
 1. Adhesive shall have a VOC content of not more than **[100]** <Insert value> g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood flooring manufacturer.
- D. Fasteners: As recommended by manufacturer, but not less than that recommended in[NWFA's "Installation Guidelines: Wood Flooring." <Insert standard or publication>.
- E. Thresholds and Saddles: To match wood flooring. Tapered on each side.
- F. Reducer Strips: To match wood flooring. 2 inches (51 mm) wide, tapered, and in thickness required to match height of flooring.
- G. Edge Strips: 2-inch- (51-mm-) wide, square-edged maple strips, furnished in lengths as long as practical and in thickness to match wood flooring.
- H. Wood Air Vents and Grilles: To match wood flooring and in sizes and design indicated on Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove coatings, including curing compounds, and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

- B. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring."
- B. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch (19 mm).
- C. Vapor Retarder: Comply with NOFMA's "Installing Hardwood Flooring" for vapor retarder installation and the following:
 - 1. Wood Flooring Nailed to Wood Subfloor: Install flooring over a layer of asphalt-saturated felt.
- D. Sound Control Underlayment: Install over vapor retarder in accordance with manufacturer's written instructions.
- E. Solid-Wood Flooring: Blind nail or staple flooring to substrate.
 - 1. For flooring of face width more than 3 inches (75 mm):
 - a. Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.
 - b. Install no fewer than two countersunk nails at each end of each piece, spaced not more than 16 inches (406 mm) along length of each piece, in addition to blind nailing. Fill holes with matching wood filler.

3.3 FIELD FINISHING

- A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.
 - 1. Comply with applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring."
- B. Fill open-grained hardwood.
- C. Fill and repair wood flooring seams and defects.
- D. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and three finish coats.
 - 1. Apply stains to achieve an even color distribution matching approved Samples.
 - 2. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.

- E. Cover wood flooring before finishing.
- F. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.

3.4 PROTECTION

- A. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.

END OF SECTION 09 64 00

SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Vinyl Composition Tile (VCT)
 - 2. Vinyl Plank Tile (VPT)
 - 3. Quartz Tile (QT) - **Add Alternate Product.**
- B. Related Sections include the following:
 - 1. Division 9 Section Resilient Wall Base and Accessories

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Maintenance Data: For resilient products to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store tiles on flat surfaces.

1.6 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:

- B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg for more than 95 deg F.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

PART 2 - PRODUCTS

2.1 VINYL COMPOSITION TILE (VCT-1-8) Eight Colors for Project.

- A. Armstrong Commercial Flooring (or equal)
 - 1. Vinyl Composition Tile Type: Standard Excelon
 - 2. Colors: To be selected by Architect, Full Range of Colors.
 - 3. Patterns: 1-5 Tile Color Pattern Options
 - 4. ASTM F1066, Class 2 – Through Pattern
 - 5. Wearing Surface: Smooth
 - 6. Thickness: 1/8 inch
 - 7. Size: 12x12 inches
 - 8. 5 Year Wear Warranty

2.2 HIGH PERFORMANCE VINYL PLANK TILE (VPT-1) One Color for Project.

- A. Johnsonite Plank Tile Flooring (Basis of Design)
 - 1. Style: ID Freedom / Woods – Solid Vinyl Tile
 - 2. Heterogeneous printed vinyl floor covering with a non-woven glass fiber
 - 3. Polyurethane Reinforced Wear Layer
 - 4. Color: To be selected by Architect, Full Range of Colors.
 - 5. ASTM F 1700, Class 3 – Type B
 - 6. Wear Layer Thickness: 20 ml or 0.20" (0.51mm)
 - 7. Overall Thickness: .125 (3.2mm) or nominal 1/8"
 - 8. Size: 4 x 48 &/or 4 x 36 inches
 - 9. Johnsonite offers a RESTART reclamation program for returning jobsite scrap.
 - 10. 100% Recyclable
 - 11. Recycled Content: 53% Pre-Consumer
 - 12. 10 Year Limited Commercial Wear Warranty
 - 13. Installation: Direct Glue

2.1 QUARTZ TILE (QT-1-8) Eight Colors for Project. Add Alternate Product.

- B. UPOFLOOR (Basis of Design)
 - 1. Quartz Tile
 - 2. Homogeneous combination of calcium carbonate and fine naturally weathered quartz.
 - 3. Collection: Mosaic – 12 x 12 & 24 x 24
 - 4. Colors: To be selected by Architect, Full Range of Colors.
 - 5. Patterns: 1-5 Tile Color Pattern Options
 - 6. ASTM F1066, Class 1 – Type A
 - 7. Wearing Surface: Smooth
 - 8. Thickness: 0.08 (2.0mm)
 - 9. Size: 12 x 12 inches & 24 x 24 inches
 - 10. Recycled Content: 30% Pre-Consumer
 - 11. VOC Emmisions: CA 01350 – Low Emitting / Floor Score Certified
 - 12. 15 Year Wear Warranty

2.3 MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- C. Follow manufacturer's recommendations for approved products and installation methods to validate warranties.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 3. Moisture Testing:

- a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
1. Do not install resilient floor tile until product is same temperature as space where it is to be installed.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 TILE INSTALLATION

- A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles square with room axis.
- B. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
- C. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- D. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- F. Install tiles on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of tile installed on covers. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

- G. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
 - a. Do not wash surfaces until after time period recommended by manufacturer.
- B. Protect resilient floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 - 1. Apply protective floor polish to surfaces that are free from soil, visible adhesive, and blemishes, if recommended in writing by manufacturer or required by owner.
 - 2. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.
 - 3. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION 09 65 19

SECTION 09 65 30 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient Rubber Floor Tile.
 - 2. Resilient Base.
 - 3. Resilient Stair Accessories.
 - 4. Resilient Molding Accessories.
- B. Related Sections:
 - 1. Division 9 Section "Resilient Floor Tile for resilient floor tile."
 - 2. Division 9 Section "Sheet Vinyl Floor Coverings" for resilient sheet floor coverings.
 - 3. Division 9 Section "Linoleum Floor Coverings" for linoleum floor coverings.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches (300 mm) long, of each resilient product color, texture, and pattern required.
- D. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than [70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Allstate Rubber Corp.; Stoler Industries.
 - 2. Armstrong World Industries, Inc.
 - 3. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
 - 4. Endura Rubber Flooring; Division of Burke Industries, Inc.
 - 5. Estrie Products International; American Biltrite (Canada) Ltd.
 - 6. Flexco, Inc.
 - 7. Johnsonite, Basis of Design.
 - 8. Mondo Rubber International, Inc.
 - 9. Musson, R. C. Rubber Co.
 - 10. Nora Rubber Flooring; Freudenberg Building Systems, Inc.
 - 11. Roppe Corporation, USA.

2.2 RESILIENT RUBBER FLOOR TILE

- A. Resilient Rubber Floor Tile: Stair Landings & Ramps
 - 1. Style: Mesto, Marbleized Rubber Floor
 - 2. Surface: Hammered
 - 3. Size: 24" x 24" (61 cm x 61 cm)
 - 4. Thickness: 2mm (.080")
 - 5. Product Performance:

- a. Hardness: ASTM D 2240 – Not less than 85 Shore A
- b. Abrasion Resistance: ASTM D 3389 <1.0 gm weight loss
- c. Slip Resistance: ASTM D 2047 – Meets or Exceeds a static coefficient of friction of 0.8
- d. Color Heat Stability: ASTM F 1514 < 8.0 □E
- e. Acoustical: ASTM E- 492 Impact Insulation Class – 40 IIC
(Test performed with 1/8" thick tiles)
- f. Static Load Limit: ASTM F 970 – 250 PSI
- g. Fire Resistance:
 - 1) ASTM E 648/NFPA 253 (Critical Radiant Flux), Class 1
 - 2) ASTM E 662/NFPA 258 (Smoke Density), less than 450
- h. Chemical Resistance: ASTM F 925, Passed

B. Colors: As selected by Architect from full range of manufacturer's colors.

2.3 RESILIENT BASE

A. Resilient Base:

- 1. Resilient Base Standard: ASTM F 1861.
- 2. Type (Material Requirement): TV (vinyl).
- 3. Group (Manufacturing Method): II (layered).
- 4. Style: Cove (with top-set toe).
- 5. Minimum Thickness: 0.125 inch.
- 6. Height: 4 inches.
- 7. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.
- 8. Outside Corners: Premolded.
- 9. Inside Corners: Premolded.
- 10. Surface: Smooth.

B. Colors and Patterns: As selected by Architect from full range of manufacturer's colors.

2.4 RESILIENT STAIR ACCESSORIES

A. Resilient Stair Treads:

- 1. Resilient Stair Treads Standard: ASTM F 2169.
- 2. Material: Rubber, Composition A
- 3. Surface Design: Pattern to be selected by Architect, Full Range of Patterns
- 4. Abrasive Strips: N/A
- 5. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees
- 6. Nosing Height: 1-1/2 inches
- 7. Thickness: ¼ inch and tapered to back edge
- 8. Size: Lengths and depths to fit full length of each stair tread in one piece
- 9. Risers: Smooth, flat, toeless, height and length to cover risers; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.
- 10. Thickness: 0.125 inch

B. Stringers: Of same thickness as risers, height and length after cutting to fit risers and treads and to cover stair stringers; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

C. Colors: To be selected by Architect from full range of manufacturer's colors.

2.5 RESILIENT MOLDING ACCESSORY

- A. Resilient Molding Accessory:
 - 1. Description: Carpet edge for glue-down applications, Reducer strip for resilient floor covering, Joiner for tile and carpet.
 - 2. Carpet Nosings: Square, adjustable to cover angles between 60 and 90 degrees
 - 3. Nosing Height: 1-1/2 inches
 - 4. Nosing Depth: 1-1/2 inches
 - 5. Thickness: 1/8"
 - 6. Size: Lengths and depths to fit full length of each stair tread in one piece
- B. Material: Rubber or Vinyl.
- C. Profile and Dimensions: Full range of manufacturer's shapes & sizes.

2.6 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less.
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.
- D. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.
- E. Floor Polish: Provide protective liquid floor polish products as recommended by resilient stair tread manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.

- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Stair Accessories:
 - 1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
 - 2. Tightly adhere to substrates throughout length of each piece.
 - 3. For treads installed as separate, equal-length units, install to produce a flush joint between units.
- C. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet and resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from resilient stair treads before applying liquid floor polish.
 - 1. Apply manufacturer's recommended coat(s).
- E. Cover resilient products until Substantial Completion.

END OF SECTION 09 65 30

SECTION 09 67 00 – RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes:
 - 1. Urethane Flooring Systems.
 - 2. Flooring system includes floor and integral, reinforced cove base.
- B. Related sections include the following:
 - 1. Cast-in-Place Concrete, section 03300

1.3 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for system specified including primers and related materials.
 - 1. Provide the manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each material proposed for use.
 - 2. List each material and cross-reference the specific product, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
 - 3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Samples for Verification Purposes: Provide samples of each color and material to be applied with texture to simulate actual conditions on representative samples of the actual substrate.
 - 1. Provide stepped samples, defining each separate coat, including fillers and primers.
 - 2. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.

1.4 QUALITY ASSURANCE

- A. Applicator Qualification Engage an experienced applicator, approved by the system manufacturer, who has successfully completed flooring system applications similar in material and extent to those indicated for the Project for a period of not less than 5 years.
- B. Single-Source Responsibility: Provide primers produced by the same manufacturer as the finish material for each type of flooring.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, new, unopened packages, and containers bearing manufacturer's name and label, and the following information:
 - 1. Name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's name, stock number and date of manufacture.
 - 4. Contents by volume, for major filler and matrix constituents.
 - 5. Application instructions.
 - 6. Color name and number.
 - 7. Handling instructions and precautions.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C) . Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 - 1. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and applying the coatings.

1.6 PROJECT CONDITIONS

- A. A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application unless manufacturer recommends a longer period.

1.7 WARRANTY

- A. Provide manufacturer's standard warranty for replacement of defective product for a period of one (1) year from date of shipment. Installer shall provide written guarantee of workmanship agreeing to furnish all labor related to remedial requirements that might arise under warranty, at no cost to the owner.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
1. System Materials: Basis of Design is General Polymers FasTop 12SL, manufactured by The Sherwin-Williams Co., Cleveland, OH.
 2. Or equal product by a single source manufacturer and made in the USA.

2.2 MATERIALS

- A. VOC Content of Resinous Flooring: Provide resinous flooring systems, for use inside the weatherproofing system, that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Resinous Flooring: 100 g/L.

2.3 PRODUCT REQUIREMENTS

- A. Resinous Flooring: Abrasion, impact and chemical-resistant, aggregate-filled, urethane-resin-based, monolithic floor surfacing designed to produce a seamless floor and integral cove base.
- B. System Characteristics:
1. Color and Pattern: As selected by Architect from manufacturer's full range.
 2. Wearing Surface: Textured for slip resistance.
 3. Overall System Thickness: Minimum 1/8" inch
- C. Primer:
1. Resin: GP3477 Water Emulsion Primer/Sealer
 2. Formulation Description: Water Emulsion.
 3. Spread Rate: 250 sq. ft. per gallon.
- D. Slurry Coats:
1. Resin: FasTop 12SL GP4080/5035 urethane.
 2. Formulation Description: High solids.
 3. Application Method: Notched trowel, squeegee, or screed rake slurry application with broadcast.
 - a. Thickness of Coats: 1/8" inch (3.2 mm).
 - b. Number of Coats: One.
 4. Aggregates: GP5310-8 broadcast to excess at 400 lbs. per 1,000 sq. ft.

- E. Topcoat: Sealing or finish coats.
 - 5. Resin: GP4844 Polyaspartic Finish Coat
 - 6. Formulation Description: 97% Solids.
 - 7. Thickness: 12-15 mils per coat.
 - 8. Type: Pigmented.
 - 9. Finish: Gloss
 - 10. Number of Coats: Two

2.4 ACCESSORIES

- D. Primer: Type recommended by manufacturer for substrate and body coats indicated.
- E. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
- F. Metal Cap for Integral Cove Base: Square metal cap approved by flooring manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces to be coated and report any conditions that could adversely affect the proper installation, performance, or appearance of the epoxy floor coating, and which are incapable of acceptable condition as dictated by the preparatory work of this section.
- B. Do not proceed with surface preparation until adverse conditions are corrected and permission to proceed is granted by the architect or owner.

3.2 SURFACE PREPARATION

- A. Surfaces must be clean and dry, free of oil, grease, detergent film, sealing and curing compounds, adhesive, paint or other non-compatible substances or contaminants.
- B. Moisture Testing: Perform tests recommended by manufacturer and as follows.
 - 1. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.
 - 2. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.
 - 3. If the vapor drive exceeds 99% relative humidity or 20 lbs/1,000 sf/24 hrs then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.
- C. Mechanical surface preparation

1. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 3-4 as described by the International Concrete Repair Institute.
 2. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
 3. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
 4. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
- D. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.3 APPLICATION

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 3. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
 4. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
 5. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
 6. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
 7. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.
 8. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

- B. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
 - 1. Integral Cove Base: 4 inches (100 mm) high.
- C. Apply self-leveling slurry body coats in thickness indicated for flooring system.
 - 1. Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.
- D. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.4 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 09 67 00

SECTION 09 68 10 - CARPET TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes modular construction carpet tile for Walk Off Mat.
- B. Related Sections include the following:
 - 1. Division 9 Section "Resilient Floor Tile" for resilient wall base and accessories installed with carpet tile.
 - 2. Division 9 Section "Carpet" for related areas.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate.
- B. LEED Submittals:
 - 1. Credit EQ 4.3: Manufacturers' product data for carpet tile and installation adhesive, including printed statement of VOC content.
- C. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Existing flooring materials to be removed.
 - 3. Existing flooring materials to remain.
 - 4. Carpet tile type, color, and dye lot.
 - 5. Type of subfloor.
 - 6. Type of installation.
 - 7. Pattern of installation.
 - 8. Pattern type, location, and direction.
 - 9. Pile direction.
 - 10. Type, color, and location of insets and borders.
 - 11. Type, color, and location of edge, transition, and other accessory strips.
 - 12. Transition details to other flooring materials.
- D. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.
 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- E. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- F. Qualification Data: For Installer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.
- H. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.
- I. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- B. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to carpet tile installation including, but not limited to, the following:
1. Review delivery, storage, and handling procedures.
 2. Review ambient conditions and ventilation procedures.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

1.6 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.7 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
 - 3. Warranty Period: 15 year wear warranty.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following listed Basis of Design selections:
 - 1. Interface FLOR (WOM-1)

- a. Pattern: 12901 Entry Level, (WOM-1, Basis of Design).
 - b. Color: To be selected by Architect, Full Range of Colors.
 - c. Installation Method: Non-Directional
 - d. Source: 1503 Orchard Hill Road
LaGrange, GA 30240
 - e. Contact: Barb Moncrief 800-336-0225 ext. 1125
- 1) Fiber Type: Invista Type 6,6 Nylon with InterfaceFLOR Approved Type 6.6 Nylon
 - 2) Dye Method: 100 % Solution Dyed
 - 3) Face Construction: Tufted Textured Loop Pile.
 - 4) Tufted Yarn Weight: 28 oz/sq yd (949g/sqm)
 - 5) Average Pile Height: .22 in., 5.6 mm.
 - 6) Pile Thickness: .15 in., 3.8 mm.
 - 7) Total Thickness: .325 in., 8255 mm.
 - 8) Gauge: 1/12 in. (47.2 rows / 10 cm)
 - 9) Stitches per Inch: 10 / in. (39.37 rows / 10 cm)
 - 10) Density: 6,720
 - 11) Primary Backing: Manufacturer's GlasBac RE Tile.
 - 12) Size: 19.69 in x 19.69 in / 50 cm x 50 cm.
 - 13) Soil Resistance Treatment: Protekt 2 w/ Zonyl 8779 Fluorochemical
 - 14) Antimicrobial Treatment: Intersept
 - 15) Location: Vestibule

2. Performance Characteristics: As follows:

- 1) Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm. Per ASTM E-648.
- 2) Smoke Density: Not less than 450. Per ASTM E-662.
- 3) Dry Breaking Strength: Not less than 100 lbf (445 N) per ASTM D 2646.
- 4) Tuft Bind: Not less than 16 lbf (45N) per ASTM D 1335.
- 5) Delamination: Not less than 4 lbf/in. (18 N/mm) per ASTM D 3936.
- 6) Dimensional Stability: 0.2 percent or less per ISO 2551 (Aachen Test).
- 7) Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.
- 8) Colorfastness to Crocking: Not less than 4, wet and dry, per AATCC-165.
- 9) Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) per AATCC-16.
- 10) Antimicrobial Activity: Not less than 2 mm halo of inhibition for gram-positive bacteria; not less than 1 mm halo of inhibition for gram negative bacteria; no fungal growth; per AATCC-174.
- 11) Stain Resistance: Shall pass AATCC Red #40 stain scale from AATCC Test Method 175-1991, "Stain Resistance: Pile Floor Coverings" described in Performance Warranties 4.
- 12) Fade Resistance: Shall pass AATCC lifetime color fade test failure as described in Performance Warranties 4.
- 13) Anti-Static Requirements: Shall have a permanent static control system warranted by the fiber manufacturer and shall not exceed 3.5 kilovolts in accordance with AATCC test 134 for the life of the carpet.
- 14) Indoor Air Quality: Shall pass CRI Indoor Air Quality program.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 - 1. VOC Limits: Provide adhesives that comply with the following limits for VOC content when tested according to ASTM D 5116:
 - a. Total VOCs: 10.00 mg/sq. m x h.
 - b. Formaldehyde: 0.05 mg/sq. m x h.
 - c. 2-Ethyl-1-Hexanol: 3.00 mg/sq. m x h.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. For wood subfloors, verify the following:
 - 1. Underlayment over subfloor complies with requirements specified in Division 6 Section "Rough Carpentry."
 - 2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- C. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
 - 2. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- D. For painted subfloors, verify the following:
 - 1. Perform bond test recommended in writing by adhesive manufacturer.
- E. For raised access flooring systems, verify the following:
 - 1. Access floor complies with requirements specified in Division 10 Section "Access Flooring."
 - 2. Access floor substrate is compatible with carpet tile and adhesive if any.

3. Underlayment surface is flat, smooth, evenly planed, tightly jointed, and free of irregularities, gaps greater than 1/8 inch, protrusions more than 1/32 inch (0.8 mm), and substances that may interfere with adhesive bond or show through surface.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer - install every tile with full-spread, releasable, pressure-sensitive adhesive.
- C. Maintain dye lot integrity. Do not mix dye lots in same area.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern based on building design and installation efficiencies. Architect to approve layout before installation.

- H. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protection of Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 68 10

SECTION 09 84 33 - SOUND-ABSORBING WALL UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes shop-fabricated, fabric-wrapped, sound-absorbing wall panel units tested for acoustical performance.
- B. Related Documents/Sections: Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:

1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
2. Division 1 Section "LEED Requirements" for additional LEED requirements.
3. Section 07901 - Joint Sealants: Concealed acoustical sealant.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Requirements:
 1. Credit EQ 4.1: Manufacturers' product data for installation adhesives, including printed statement of VOC content.
 2. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
 3. Regional Materials MR Credit 5.1: Use a minimum of 20 percent of building materials and products (cost) that are manufactured regionally, within a 500-mile radius.
- C. Shop Drawings: For sound-absorbing wall units. Include mounting devices and details.
- D. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide sound-absorbing wall units meeting the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 2. Fire Growth Contribution: Meeting acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 and/or NFPA 286.

PART 2 - PRODUCTS

2.1 SOUND-ABSORBING WALL UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
1. Decoustics Limited; a CertainTeed Ceilings company.
 2. Acoustical Panel Systems (APS, Inc.). 5 Le Way Drive #115 • Fredericksburg, VA 22406
Tel: 540.371.3370. Fax: 540.371.867. E-mail: acpansys@aol.com. Web: www.acpansys.com. Toll Free: 1.800.277.7978 Attn: Bob Bennett.
 3. Acoustical Solutions, Inc., Richmond, VA.
 4. Armstrong World Industries.
 5. AVL Systems, Inc. Ocala FL.
 6. Benton Brothers Solutions, Inc., Cartersville, GA.
 7. Conwed Designscape; an Owens Corning company.
 8. Essi Acoustical Products, Cleveland, Ohio.
 9. Golterman & Sabo. St. Louis, MO.
 10. Kinetics Noise Control, Inc.
 11. Lamvin, Inc. Oceanside CA.
 12. MBI Products Company, Inc. Elyria, OH
 13. Panel Solutions, Inc. Hazleton, PA.

14. Perdue Acoustics. Amarillo, TX. Erin, TN
 15. Pinta Acoustic, Inc. Minneapolis, MN
 16. Proudfoot Company, Inc. (The). Monroe, CT.
 17. Sound Management Group LLC. Hillsborough, New Jersey
 18. Wall Technology, Inc.; an Owens Corning company. Ladysmith, WI.
 19. Working Walls, Inc. Cleveland, OH.
- C. General Requirements for Sound-Absorbing Wall Units: Units shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Sound-Absorbing Wall Panel: Manufacturer's standard panel construction consisting of fabric facing material stretched over front face of chemically hardened edge core and bonded or attached to edges and back of frame.
1. Basis-of-Design Product: Decoustics Acoustical panel AP.
 2. Mounting: Edge mounted with splines secured to substrate.
 3. Mounting: Back mounted with manufacturer's standard adhesive, secured to substrate.
 4. Core: Manufacturer's standard glass-fiber board.
 - a. Core-Face Layer: Acoustically transparent fabric approved by manufacturer for installation on their core.
 5. Edge Construction: Manufacturer's standard chemically hardened core with no frame.
 6. Edge Profile: Square.
 7. Corner Detail in Elevation: Square with continuous edge profile indicated.
 8. Reveals between Panels: Flush.
 9. Facing Material: Fabric shall be by Maharam. Color shall be selected from manufacturer's full range. Local Rep: Maharam, Baltimore, MD 20037, phone: 404-909-8450, cell: 443-845-4263. Attn. Daisy Hopkins
 - a. Wall-Covering Standard: Provide wall coverings that comply with ASTM F 793 for Category III, Decorative with High Serviceability products.
 - b. Flammability: Class A fire rated in accordance with ASTM-E84 tunnel test.
 - c. Lightfastness: 200+ hours.
 - d. Fabric Types:
 - 1) FAP-1: Product Name: Crisp Unbacked 901860
 - 2) Finish: No Backing.
 - 3) Color: #010 Zinc or equal as selected from manufacturer's full range of colors.
 - 4) Content: 100% Polyester.
 - 5) Width: 66".
 10. Acoustical Performance: Sound absorption NRC of .85 according to ASTM C 423 for adhesive mounting according to ASTM E 795.
 11. Nominal Overall Panel Thickness: 1 inch.

2.2 MATERIALS

- A. Core Materials:
 - 1. Glass-Fiber Board: ASTM C 612; Type standard with manufacturer with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- B. Facing Material Fabric from same dye lot; color and pattern.
- C. Mounting Devices: Concealed on back of unit, recommended by manufacturer to support weight of unit, and as follows:
 - 1. Adhesives: As recommended by sound-absorbing wall unit manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 FABRICATION

- A. General: Use manufacturer's standard construction except as otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.
- B. Core-Face Layer: Evenly stretched over core face and edges and securely attached to core; free from puckers, ripples, wrinkles, or sags.
- C. Facing Material: Apply fabric facing fully covering visible surfaces of unit; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.
 - 1. Fabrics with Directional or Repeating Patterns or Directional Weave: Mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent units.
- D. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install sound-absorbing wall units in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.
- B. Comply with sound-absorbing wall unit manufacturer's written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.
- C. Align and level fabric pattern and grain among adjacent units.
- D. Clip loose threads; remove pills and extraneous materials.

- E. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 098433

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
- D. Related Sections include the following:
 - 1. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
 - 2. Division 5 Section "Metal Stairs" and "Metal Stair Railings".
 - 3. Division 8 Section "Steel Doors and Frames" for factory priming steel doors and frames.
 - 4. Division 9 Section "Gypsum Board" for surface preparation of gypsum board.

1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
 - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
 - 3. Semi-Gloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
 - 4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- B. Samples for Initial Selection: For each type of finish-coat material indicated.
 - 1. After color selection, Architect will furnish color chips for surfaces to be coated.
- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
 - 1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 - 2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
- D. Qualification Data: For Applicator.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
 - 1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate for evaluation of quality of finish coat and paint adhesion.
 - a. Wall Surfaces: Provide samples on at least 100 sq. ft.
 - b. Small Areas and Items: Architect will designate items or areas required.
 - 2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
 - a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.7 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.
 1. Benjamin Moore & Co. (Benjamin Moore).
 2. PPG Industries, Inc. (Pittsburgh Paints).
 3. Sherwin-Williams Co. (Sherwin-Williams), Basis of Design.
 4. Rosco Laboratories, Inc., Chroma Key Paint, Basis of Design

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: As selected by Architect from manufacturer's full range.
 - 1. Anticipate up to 4 exterior and 12 interior colors for conventional paint products (refer to Finish Schedule). Gyp Ceilings & Bulkheads to be Flat finish, Gyp Walls to be Eggshell finish, Block walls to be Semi-Gloss finish, and Trim & Metals to be Semi-Gloss finish.

2.3 CONCRETE UNIT MASONRY BLOCK FILLERS

- A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.
 - 1. Sherwin-Williams; Interior/Exterior Block Filler B25W25: Applied at a dry film thickness of not less than 8.0 mils., Basis of Design.

2.4 EXTERIOR PRIMERS

- A. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.
 - 1. Sherwin-Williams; Pro Industrial Pro-Cryl Universal Metal Primer B66-310: Applied at a dry film thickness of not less than 3.0 mils., Basis of Design.
- B. Exterior Galvanized Metal Primer: Factory-formulated galvanized metal primer for exterior application.
 - 1. Sherwin-Williams; Pro Industrial Pro-Cryl Universal Metal Primer B66-310: Applied at a dry film thickness of not less than 3.0 mils., Basis of Design.

2.5 INTERIOR PRIMERS

- A. New Wood: Factory-formulated latex-based primer for interior application.
 - 1. Sherwin-Williams; Premium Wall/Wood B28W8111. Applied at a dry film thickness of not less than 3.0 mils., Basis of Design.
- B. Old Wood: Factory-formulated latex-based primer for interior application.

1. Sherwin-Williams; Multi-Purpose Int./Ext. Latex/Primer B51-450 Series. Applied at a dry film thickness of not less than 3.0 mils., Basis of Design.
- C. Interior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic-latex interior primer for interior application.
1. Sherwin-Williams; Loxon Concrete & Masonry Primer B28W8300: Applied at a dry film thickness of not less than 3.0 mils., Basis of Design.
- D. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.
1. Sherwin-Williams; ProMar 200 Zero VOC Latex Wall Primer B28W2600 Series: Applied at a dry film thickness of not less than 1.1 mils., Basis of Design.
- E. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.
1. Sherwin-Williams; Pro Industrial Pro-Cryl Universal Metal Primer B66-310: Applied at a dry film thickness of not less than 3.0 mils., Basis of Design.

2.6 EXTERIOR FINISH COATS

- A. Exterior Semi-Gloss Acrylic Enamel: Factory-formulated Semi-Gloss waterborne acrylic-latex enamel for exterior application.
1. Sherwin-Williams; Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series: Applied at a dry film thickness of not less than 2.5-4.0 mils., Basis of Design.

2.7 INTERIOR FINISH COATS

- A. Old & New Wood: Factory-formulated eggshell acrylic-latex interior enamel.
1. Sherwin-Williams; Pro Industrial PreCatalyzed Waterbased Epoxy Eg-Shel, K45-150 Series: Applied at a dry film thickness of not less than 1.7 mils., Basis of Design.
- B. New Interior Gypsum Board Ceiling: Factory-formulated latex-based Flat finish for interior application.
1. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Flat, B30 Series: Applied at a dry film thickness of not less than 1.7 mils., Basis of Design.
- C. Interior Low-Luster Acrylic Enamel: Factory-formulated Eggshell acrylic-latex interior enamel.
1. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Eg-Shel, B20W2651 Series: Applied at a dry film thickness of not less than 1.7 mils., Basis of Design.
- D. Interior Low-Luster Waterbased Epoxy for Areas subject to Frequent Cleanings, & Rest Room Wet Wall Areas: Factory-formulated Eg-Shel Water Based Epoxy.
1. Sherwin-Williams; PRO Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45150 series: Applied at a dry film thickness of not less than 1.5 mils., Basis of Design.

- E. Interior Semi-Gloss Waterbased Epoxy for Areas subject to Heavier Abrasion: Factory-formulated Semi-Gloss Water Based Epoxy for interior application.
 - 1. Sherwin-Williams; PRO Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46150 series: Applied at a dry film thickness of not less than 1.5 mils., Basis of Design.
- F. Interior Semi-Gloss Acrylic Enamel for Areas subject to Normal Abrasion: Factory-formulated Semi-Gloss acrylic-latex enamel for interior application.
 - 1. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W2650 Series: Applied at a dry film thickness of not less than 1.5 mils., Basis of Design.
- G. Interior Semi-Gloss Waterbased Alkyd Urethane Enamel for Ferrous & Galvanized Metal: Factory-formulated Semi-Gloss acrylic-latex enamel for interior application.
 - 1. Sherwin-Williams; Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series: Applied at a dry film thickness of not less than 1.4-1.7 mils., Basis of Design.
- H. Interior Eg-Shel Industrial Waterborne Acrylic Dryfall for Metal Decking surfaces:
 - 1. Sherwin-Williams; Pro Industrial Waterbrone Acrylic Dryfall Eg-Shel, B42W82 series: Applied at a dry film thickness of not less than 1.9-2.9 mils., Basis of Design.
- I. Interior Semi-Gloss Industrial Waterborne Acrylic Dryfall for Metal Structure & Mechanical Ductwork Surfaces:
 - 1. Sherwin-Williams; Pro Industrial Waterbrone Acrylic Dryfall Semi-Gloss, B42W83 series: Applied at a dry film thickness of not less than 2.3-3.5 mils., Basis of Design.

2.8 INTERIOR WOOD STAINS AND VARNISHES

- A. Open-Grain Wood Filler: Factory-formulated paste wood filler applied at spreading rate recommended by manufacturer.
 - 1. Sherwin-Williams; Sher-Wood Fast-Dry Filler., Basis of Design.
- B. Stain: Factory-formulated stain applied at spreading rate recommended by manufacturer.
 - 1. Sherwin-Williams; Wood Classics 250 VOC Satin, Basis of Design.
- C. Finish: Factory-formulated finish applied at spreading rate recommended by manufacturer.
 - 1. 2 coats: Sherwin-Williams; Wood Classics WB Poly A68F90 Satin, Basis of Design.

2.9 INTERIOR WOOD VARNISHES FOR REFINISHING OF SALVAGED WOOD FLOORING

- A. Refinishing of Salvaged Tongue and Groove Wood Flooring
 - 1. Remove the existing polyurethane finish from salvaged wood flooring down to bare wood.

2. Finish system: Provide AWI System #TR-4, Conversion Varnish with clear natural finish. Class A Flame Spread, Class 1 Finish Fire Rating.

2.10 CHROMA KEY PAINT FOR VIDEO PRODUCTION

- A. Video Production Wall Paint
- B. Manufacturer: Rosco Laboratories, Inc., Basis of Design
 1. Address: 52 Harbor View Avenue, Stamford, CT 06902
 2. Contact: (203) 708-8900 / www.rosco.com
- C. Provide High Luminance Value and Color Saturation for Keying Effects.
 1. Finish: Matte
 2. Solvent: Water
 3. Binder Type: Vinyl Acrylic
 4. Dilution: Straight out of Can.
 5. Surface Preparation:
 - a. Surfaces should be clean, dry, and free from dirt and grease. Prime porous surfaces, except fabrics, using Rosco Tough Prime. If painting a new plaster surface, prime wall with a commercial primer/sealer designed for raw plaster. Use Rosco Tough prime as a final preparation.
 6. Application:
 - a. Stir contents before use. Do not shake. Apply by brush, roller, or spray gun. Apply in thin, even, uniform coats, using a good quality brush or roller. Use overlapping strokes, keeping a wet edge. Change roller direction often to avoid patterns and streaking.
 7. Film Thickness: 2 mil. Dry Film.
 8. VOC Content: Max 50g/L.
 9. Coverage: Approximately 300 sq. ft. per gallon.
 10. Average Dry Time: At 75 degrees F (24 C) Dries to the touch in 30 minutes. Can be re-coated in 1-2 hours.
 11. Clean Up: Soap and Water
 12. Shelf Life: Minimum 24 Months
 13. Packaging: Quarts, 1 and 5 Gallon.
 14. Colors:
 - a. Chroma Key Green #05711, Basis of Design
 - 1) Phase Angle: 242 Degrees
 - 2) Luminance: 57
 - b. Chroma Key Blue #05710
 - 1) Phase Angle: 342 Degrees
 - 2) Luminance: 52

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime.
 2. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
 - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes

- and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
 - c. If transparent finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
- a. Power Tool Clean steel surfaces as recommended by paint system manufacturer and according to SSPC-SP 3.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 2. Provide finish coats that are compatible with primers used.
 3. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 5. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
 8. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 9. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical items to be painted are specified to be painted in Division 15.
- F. Electrical items to be painted are specified to be painted in Division 16.
- G. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- H. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others.

Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

- I. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- J. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats.
- K. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
 - 1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
 - 2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE

- A. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.
 - 1. Semigloss Acrylic-Enamel Finish: Two finish coats over a rust-inhibitive primer.
 - a. Primer: Exterior ferrous-metal primer.
 - b. Finish Coats: Exterior Semi-Gloss acrylic enamel.
- B. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:
 - 1. Semigloss Acrylic-Enamel Finish: Two finish coats over a galvanized metal primer.
 - a. Primer: Exterior galvanized metal primer.
 - b. Finish Coats: Exterior Semi-Gloss acrylic enamel.

3.8 INTERIOR PAINT SCHEDULE

- A. Concrete Unit Masonry: Provide the following finish systems over interior concrete masonry:
 - 1. Water Based Pre-Catalyzed Epoxy – Eg-Shel: Two finish coats over a block filler.
 - a. Block Filler: Concrete unit masonry block filler.
 - b. Finish Coats: Interior Waterbased Pre-Catalyzed Epoxy, Eg-Shel.
 - c. Location: Rest Rooms above Ceramic Tile Wainscot
 - 2. Water Based Pre-Catalyzed Epoxy – Semi-Gloss: Two finish coats over a block filler.
 - a. Block Filler: Concrete unit masonry block filler.
 - b. Finish Coats: Interior Waterbased Pre-Catalyzed Epoxy, Semi-Gloss.
 - c. Location: Multi-purpose/Gym & Lobby Walls
- B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
 - 1. Low-Luster / Eg-Shel Acrylic-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior gypsum board primer.
 - b. Finish Coats: Interior low-luster / Eg-Shel acrylic enamel.
- C. Wood and Hardboard: Provide the following paint finish systems over new interior wood surfaces:
 - 1. Semi-Gloss Acrylic-Enamel Finish: Two finish coats over a wood undercoater.

- a. Primer: Interior wood primer for acrylic-enamel and Semi-Gloss alkyd-enamel finishes.
 - b. Finish Coats: Interior Semi-Gloss acrylic enamel.
- D. Ferrous Metal: Provide the following finish systems over ferrous metal:
- 1. Semigloss Waterbased Alkyd Urethane Finish: Two finish coats over a primer.
 - a. Primer: Interior ferrous-metal primer.
 - b. Finish Coats: Waterbased Alkyd Urethane Semi-Gloss Enamel.
- E. Zinc-Coated Metal (not decking): Provide the following finish systems over interior zinc-coated metal surfaces:
- 1. Semigloss Waterbased Alkyd Urethane Finish: Two finish coats over a primer.
 - a. Primer: Interior zinc-coated metal primer.
 - b. Finish Coats: Waterbased Alkyd Urethane Semi-Gloss Enamel.
- F. Metal Decking: Provide the following finish over Metal Decking surfaces:
- 1. Eg-Shel Acrylic Dryfall: Two finish coats directly to properly prepared or primed galvanized decking surface, structure, & mechanical ductwork surfaces.
 - a. Finish Coats: Pro Industrial Waterborne Acrylic Dryfall Eg-Shel.
- G. Metal Ceiling Structure & Mechanical Ductwork: Provide the following finish over Metal Structure & Mechanical Ductwork surfaces:
- 1. Semi-Gloss Industrial Waterborne Acrylic Dryfall: Two finish coats directly to properly prepared or primed structure & mechanical ductwork surfaces.
 - a. Finish Coats: Pro Industrial Waterborne Acrylic Dryfall Semi-Gloss.

END OF SECTION 09 91 00

SECTION 10 10 00 - VISUAL DISPLAY BOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Porcelain enamel marker boards - Magnetic.
 - 2. Tackboards and Tackstrips.
- B. Related Sections include the following:
 - 1. See Section 06100 Rough Carpentry for wood blocking and grounds.

1.3 SUBMITTALS

- A. Product Data: For each type of visual display board indicated. Include motor capacities and individual panel weights for markerboard units.
- B. Shop Drawings: For each type of visual display board required.
 - 1. Include dimensioned elevations. Show location of joints between individual panels where unit dimensions exceed maximum panel length.
 - 2. Include sections of typical trim members.
 - 3. Show anchors, grounds, reinforcement, accessories, layout, and installation details.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and textures available for the following:
 - 1. Markerboards: Actual sections of porcelain enamel finish for each type of chalkboard and markerboard required.
 - 2. Tackboards- Corner sections of frame.
- D. Samples for Verification: Of the following products, showing color and texture or finish selected. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected. Prepare Samples from the same material to be used for the Work.
 - 1. Visual Display Boards: Sample panels not less than 8-1/2 by 11 inches (215 by 280 mm), mounted on the substrate indicated for the final Work. Include a panel for each type, color, and texture required.

- E. Product Certificates: Signed by manufacturers of tackboards certifying that vinyl-fabric-faced cork tackboard materials furnished comply with requirements specified for flame-spread ratings.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is an authorized representative of chalkboard manufacturer for both installation and maintenance of the type of sliding chalkboard units required for this Project.
- B. Source Limitations: Obtain visual display boards through one source from a single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of visual display boards and are based on the products indicated.
- D. Fire-Test-Response Characteristics: Provide vinyl-fabric-faced tackboards with the following surface-burning characteristics as determined by testing assembled materials composed of facings and backings identical to those required in this Section per ASTM E 84 by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify vinyl-fabric-faced tackboards with appropriate markings of applicable testing and inspecting agency.
 - 1. Flame Spread: 25 or less.
 - 2. Smoke Developed: 10 or less.
- E. Mockups: Before installing visual display boards, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work.
 - 1. Locate mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before proceeding with fabrication of visual display boards.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - a. When directed, demolish and remove mockups from Project site.
 - b. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify field measurements before preparation of Shop Drawings and before fabrication to ensure proper fitting. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.
 - 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating chalkboards without field

measurements. Coordinate wall construction to ensure actual dimensions correspond to established dimensions.

1.6 WARRANTY

- A Porcelain Enamel Markerboard Warranty: Submit a written warranty executed by manufacturer agreeing to replace porcelain enamel chalkboards that do not retain their original writing and erasing qualities, become slick and shiny, or exhibit crazing, cracking, or flaking within the specified warranty period, provided the manufacturer's written instructions for handling, installation, protection, and maintenance have been followed.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Projection Plus Porcelain Enamel Markerboards:

Representative Product Manufacturer:

- a. Boxlight, Rainier WB95 Diagonal WhiteBoard

- 1) Color/Finish: No. 77 White, Smooth Matte.
- 2) Foil vapor barrier.
- 3) Magnetic.
- 4) Size: Viewable Area 81.5 in x 51.2 in / Frame Dimensions 83 in x 52.8 in
- 5) Website: www.boxlight.com
- 6) phone: 360-464-2119

Equal Product Manufacturer:

- b. Best-Rite Manufacturing Model 204X with #33W markertray
- c. ADP/Lemco, Inc.
- d. Claridge
- e. Egan Visual Inc.

2. Tackboards and Tackstrips:

Representative Product Manufacturer:

- a. Best-Rite Manufacturing Model 303X natural cork tackboard
 - 1) Color/Finish: Natural cork on hardboard core
 - 2) Size: as shown on the drawings.
 - 3) Continuous tackstrip.

3. Accessories:

Representative Product Manufacturer:

- a. Best-Rite Model C-513 2" Flagholders
- b. Best-Rite Model C-511 2" Hook Clip
- c. Best-Rite Model C-529 2" L-Clips & Screws
- d. Best-Rite Model End Stops & Paper Holders.

2.2 MATERIALS

A. Markerboards:

Porcelain-Enamel Face Sheet with magnetic backing: ASTM A 424, enameling-grade steel, uncoated thickness indicated; with exposed face and edges coated with primer, 1.7-to-2.5-mil- (0.043-to-0.064-mm-) thick ground coat, and color cover coat; and concealed face coated with primer and 1.7-to-2.5-mil- (0.043-to-0.064-mm-) thick ground coat.

1. Gloss-Finish Cover Coat: Gloss as indicated; dry-erase markers wipe clean with dry cloth or standard eraser. Minimum 3.0-to-4.0-mil- (0.076-to-0.102-mm-) thick cover coat. Cover and ground coats shall be fused to steel at manufacturer's standard firing temperatures but not less than 1475 deg F (802 deg C).
 - a. Color: Matte White: Low glare and distortion free surface allows for use as a projection screen.
 - b. Pen tray.

2.3 MARKERBOARD ACCESSORIES

A. Trim and Accessories:

1. Where size of visual display boards or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
2. Markertrays:
 - a. Manufacturer's standard, continuous, aluminum, Markertray.

2.4 FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- C. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine wall surfaces, with Installer present, for compliance with requirements and other conditions affecting installation of visual display boards.
 - 1. Surfaces to receive markerboards shall be free of dirt, scaling paint, and projections or depressions that would affect smooth, finished surfaces of chalkboards or markerboards.
 - 2. Surfaces to receive tackboards shall be dry and free of substances that would impair the bond between tackboards and substrate.
 - 3. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF MARKERBOARDS

- A. Deliver factory-built visual display boards completely assembled in one piece without joints, where possible. If dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site. Use splines at joints to maintain surface alignment.
- B. Install units in locations and at mounting heights indicated and according to manufacturer's written instructions. Keep perimeter lines straight, plumb, and level. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- C. Coordinate Project-site-assembled units with grounds, trim, and accessories. Join parts with a neat, precision fit.
- D. Installation of Walltalkers:

3.3 ADJUSTING AND CLEANING

- A. Verify that accessories required for each unit have been properly installed and that operating units function properly.
- B. Clean units according to manufacturer's written instructions.

END OF SECTION 101000

SECTION 10 12 00 - DISPLAY CASES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Illuminated display cases.
- B. Related Sections:
 - 1. Division 06 Section "Finish Carpentry for custom cabinets for display cases.
 - 2. Division 26 Sections for wiring and other electrical work associated with illuminated display cases.

1.3 DEFINITIONS

- A. Display Case: Glazed cabinet with visual display surface background and adjustable shelves.

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Display cases shall withstand the effects of earthquake motions according to ASCE/SEI 7.
 - 1. Component Importance Factor is 1.0.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C)] , material surfaces.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for display cases.
- B. LEED Submittal:
 - 1. Product Data for Credit EQ 4.4: For composite wood products used in display cases, documentation indicating that product contains no urea formaldehyde.

- C. Shop Drawings: For display cases. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show location of seams and joints in visual display surfaces.
 - 2. Include sections of typical trim members.
 - 3. Wiring Diagrams: For power, signal, and control wiring.
- D. Samples for Initial Selection: For units with factory-applied color finishes, and as follows:
 - 1. Actual sections of visual display surfaces.
 - 2. Section of header panel for color selection.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for surface-burning characteristics of fabrics.
- F. Maintenance Data: For visual display surfaces, operating hardware[, and illuminated units] to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain display cases from single source from single manufacturer.
- B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install display cases until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Verify actual dimensions of openings for display cases by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hardboard: ANSI A135.4, tempered.
- B. Particleboard: ANSI A208.1, Grade M-1, made with binder containing no urea formaldehyde.

- C. Fiberboard: ASTM C 208.
- D. Hardwood Plywood: HPVA HP-1, made with adhesive containing no urea formaldehyde.
- E. Plastic-Impregnated Cork Sheet: Seamless, homogeneous, self-sealing sheet consisting of granulated cork, linseed oil, resin binders, and dry pigments that are mixed and calendared onto burlap backing; with washable vinyl finish and integral color throughout.
- F. Extruded-Aluminum Bars and Shapes: ASTM B 221 (ASTM B 221M), Alloy 6063.
- G. Aluminum Tubing: ASTM B 429, Alloy 6063.
- H. Clear Tempered Glass: ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality Q3, with exposed edges seamed before tempering, and 6 mm thick unless otherwise indicated.
- I. High-Pressure Plastic Laminate: NEMA LD 3.
- J. Fasteners: Provide screws, bolts, and other fastening devices made from same material as items being fastened, except provide hot-dip galvanized, stainless-steel, or aluminum fasteners for exterior applications. Provide types, sizes, and lengths to suit installation conditions. Use security fasteners where exposed to view.

2.2 DISPLAY CASE

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. A-1 Visual Systems.
 - 2. AARCO Products, Inc.
 - 3. ADP Lemco, Inc.
 - 4. Best-Rite Manufacturing.
 - 5. Claridge Products and Equipment, Inc.
 - 6. Ghent Manufacturing, Inc.
 - 7. Nelson-Harkins Industries.
 - 8. Platinum Visual Systems; a division of ABC School Equipment, Inc.
 - 9. Poblocki Sign Company.
 - 10. PolyVision Corporation; a Steelcase company.
 - 11. Tablet & Ticket Co. (The).
- B. Recessed Cabinet: Factory-fabricated cabinet; with tackboard assembly on back inside surface, operable glazed doors at front, and trim on face to cover edge of recessed opening.
 - 1. Cabinet Box: Extruded aluminum.
 - 2. Cabinet Frame and Trim: Aluminum.
 - 3. Aluminum Finish: Clear anodic.
- C. Glazed Sliding Doors: Tempered glass; unframed; with extruded-aluminum top and bottom track; supported on nylon or ball-bearing rollers; with plastic top guide and rubber bumpers. Equip each door with ground finger pull and adjustable cylinder lock with two keys.
 - 1. Thickness: Not less than 6 mm thick.
 - 2. Number of Doors: As indicated on Drawings.

- D. Shelves: 6-mm-thick tempered glass; supported on adjustable shelf standards and supports.
 - 1. Shelf Width: 8 inches.
 - 2. Number of Shelves: As indicated on Drawings
 - 3.
- E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04102; with shelf brackets, Recess mounted in rear surface
- F. Provide standards full height of display case.
- G. Tack Surface: Plastic-impregnated-cork tackboard assembly <Insert designation>.
 - 1. Color: As selected by Architect from manufacturer's full range.
- H. Illumination System: Concealed top-lighting system consisting of LED-strip fixtures. Include lamps and internal wiring with single concealed electrical connection to building system. Coordinate electrical characteristics with power supply provided.

2.3 FABRICATION

- A. Fabricate display cases to requirements indicated for dimensions, design, and thickness and finish of materials.
- B. Use metals and shapes of thickness and reinforcing to produce flat surfaces, free of oil-canning, and to impart strength for size, design, and application indicated.
- C. Fabricate cabinets and door frames with reinforced corners, mitered to a hairline fit, with no exposed fasteners.
- D. Fabricate exterior units with vents to permit evaporation of moisture trapped inside.
- E. Fabricate shelf standards plumb and at heights to align shelf brackets for level shelves.

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

- B. Color Anodic Finish: AAMA 611, AA-M12C22A32/A34, Class II, 0.010 mm or thicker.
- C. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power system to verify actual locations of connections before installation of illuminated units.
- C. Examine walls and partitions for proper backing for [bulletin boards] [and] [display cases].
- D. Examine walls and partitions for suitable framing depth if recessed units will be installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for display cases as required by type and size of unit.

3.3 INSTALLATION

- A. General: Install units in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Recessed Display Cases: Attach units to wall framing with fasteners at not more than 16 inches (400 mm) o.c. Attach aluminum trim over edges of recessed display cases and conceal grounds and clips. Attach trim with fasteners at not more than 24 inches (600 mm) o.c.
- C. Comply with requirements in Division 26 for connecting illuminated display cases.
 - 1. After installation is complete, install new fluorescent lamps.
- D. Install display case shelving level and straight.

3.4 ADJUSTING AND CLEANING

- A. Adjust doors to operate smoothly without warp or bind and so contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

- B. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 10 12 00

**Geotechnical Engineering Study, Victory Villa
Elementary School Building, 500 Compass Rd,
Middle River, Maryland (DWK Contract Number
15228.D)**

D.W. KOZERA, INC.
PROFESSIONAL ENGINEERS & GEOLOGISTS

April 8, 2016

Murphy & Dittenhafer Architects
805 North Charles Street
Baltimore, Maryland 21201

Attn: Mr. Peter Schwab / Ms. Lauren Myatt
(pjs@murphdittarch.com) / (lmm@murphdittarch.com)

Subject: Geotechnical Engineering Study, Victory Villa Elementary School, 500
Compass Rd, Middle River, Maryland (DWK Contract Number 15228.D)

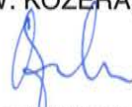
Dear Mr. Schwab:

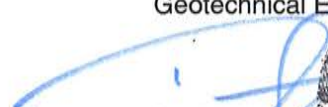
D.W. Kozera, Inc. is pleased to submit this report containing the results of the subsurface investigation and geotechnical engineering study of a new School Building at 500 Compass Road, Middle River, MD. The scope of services referenced in this report was performed in accordance with our contract dated November 12, 2015.

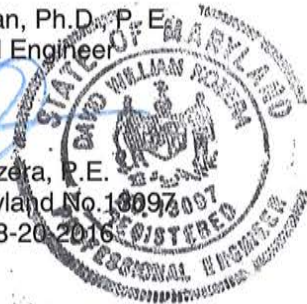
We appreciate the opportunity to be of service to you and the project team. Please contact us if you have any questions related to this subsurface investigation report.

Very truly yours,

D.W. KOZERA, INC.


Amsalu Birhan, Ph.D., P.E.
Geotechnical Engineer


David W. Kozera, P.E.
State of Maryland No. 13097
Expiration: 08-20-2016



I hereby certify that this document was prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 13097, and Expiration Date: 08-20-2016.

cc: Site Resources, Inc.
Attn: Mr. Fritz Behlen
(fbehlen@siteresourcesinc.com)

Carroll Engineering, Inc.
Attn: Ms. Kelly Cray, P.E.
(kcray@ceieengineering.com)

Geotechnical Engineering Study
Victory Villa Elementary School Building
500 Compass Rd, Middle River, Maryland
(DWK Contract Number 15228.D)

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EXECUTIVE SUMMARY

A summary of the important geotechnical findings and recommendations contained within this report are discussed below. Details of each item are contained in the body of the report.

Proposed Construction- New School Building is planned at 500 Compass Rd, Middle River, Maryland. It is our understanding that the planned School Building will have a finish floor elevation of EL + 48_±. The proposed building is to be constructed by demolishing the existing one story brick building. Maximum column loads of approximately 200 kips and exterior wall loads of approximately 2.5 klf were provided to us for the proposed building. Asphalt parking areas are planned on the south and northwest side of the site. In addition, five stormwater management facilities are also planned.

Subsurface Conditions- Man-Placed clay fill soils were encountered in all of the test borings to depths of 4 to 9 feet below the existing grade. Cretaceous Age Potomac Group Formation soils underlie the Man-Placed fill soils. The clay soils located at the site are locally known to have shrink and swell properties and as such are causes of heaving of floor slabs and pavements. Below the Coastal Plain Deposits, a residual soil profile is expected to exist extending to the top of the bedrock. The bedrock is estimated to be at a depth over 50 feet below the ground surface.

Groundwater- Groundwater was encountered in all test borings. Twenty-four hour readings were taken in the test borings. The ground water table is estimated to lie at a depth of approximately 4 ft. to 10 ft. below the existing ground surface (EL + 43_± to EL + 38_±).

Seismic Site Class- The site is considered a Site Class D as per IBC 2012.

Earthwork- Conventional earthmoving equipment is expected to be feasible for the cut and fill operations. Due to the expansive nature of the clay soils at this site, it is critical that the moisture content of these soils not be altered.

- A significant portion of the on-site soils are moderate to highly plastic clays and are not considered suitable for re-use as compacted structural fill. The use of offsite borrow will be required.
- Floor slab, pavement and sidewalk subgrades shall consist of a minimum of 12 inches of granular material; therefore, undercutting and replacing unsuitable material beneath pavements will be required. Alternatively, the top 12 inches of material beneath floor slabs and pavements may be treated with cement, i.e., soil-cement.
- Utility lines entering or existing the building should be backfilled with flowable fill to prevent migration of water through the utility trench into the clay soils below the floor slabs.

Foundation System- The proposed building is expected to be supported on a shallow foundation system. The foundation is expected to consist of spread footings founded on suitable natural soils or compacted structural fills. New foundations may be designed for an allowable bearing pressure of 2.5 ksf for footings founded on Potomac Formations or for footings founded on structural compacted fills.

Floor Slab- The floor slab should be supported on cement treated existing fill or newly placed compacted fill, and can be designed using a modulus of subgrade reaction (k) of 120 pci. Re-compaction and proofrolling of the subgrades are required prior to slab construction.

Subdrainage- Groundwater is estimated to be at least 5 feet below proposed floor grades, and a special underfloor subdrainage system is not considered necessary. All retaining walls below grade should have a perimeter foundation drain installed. Deeper excavations for utilities may encounter groundwater and may require temporary or permanent dewatering.

Construction Considerations-As a separate demolition package is to be issued prior to building

construction, it is critical that the building, pavement and compacted fill subgrades be protected during demolishing and site grading. The underlying clays soils at the site are known to have shrink and swell characteristics. For the proper performance of floor slabs and pavements, it is critical that the underlying clay soils not be exposed to either drying or wetting. This can be accomplished by leaving 12 inches of existing soil above subgrade to future cut areas or by placing 12 inches of compacted fill above future fill areas. Alternatively, the site can be graded to the required building, pavement and compacted fill subgrades with the top 12-inches of the existing clay soils at the required subgrades be treated by cement immediately after demolition and site grading.

General Recommendation-The subsurface conditions below the site will vary across the site. The performance of the recommended foundation systems is dependent upon careful observations of these subgrades during construction. As the Geotechnical Engineer of Record, D. W. Kozera, Inc. is best suited to evaluate the foundation subgrades during construction, so that modifications in the design may be made as variations in the foundation conditions are encountered.

1.0 INTRODUCTION

1.1 Purpose and Scope

This report contains the results of our geotechnical investigation and analysis for the new School Building Project site located at 500 Compass Rd in Middle River, Maryland. The report is based on the evaluation of 13 new test borings performed on the project site, available geologic data and our experience on neighboring sites. This study was conducted to characterize the subsurface conditions, and to establish engineering properties of the underlying materials in order to prepare recommendations for foundations, retaining walls, road pavements, earthwork, stormwater management facilities and issues related to the construction of foundation and site work.

The geotechnical investigation was performed in accordance with our proposal dated November 12, 2015, and included a subsurface investigation program consisting of 13 test borings for this project to depths of 10 to 30 feet. This report includes:

- a) Review of our test procedures, results of all testing conducted and available geotechnical and geological data.
- b) Description of site geologic and groundwater conditions.
- c) Presentation of subsurface soil stratigraphy with pertinent available physical properties.
- d) Recommended geotechnical design parameters including soil strength, density and compressibility as applicable.
- e) Recommendations for a shallow foundation system including allowable soil bearing pressure, anticipated settlements and subgrade elevations for foundations.
- f) Assessment of the influence of the proposed foundation and construction on adjacent structures.
- g) Slab-on-grade design recommendations for the facility including the modulus of subgrade reaction, k, in pounds per cubic inch to be used to design the concrete slab-on-grade for the buildings.
- h) Recommendations for foundation drains and dewatering procedures, as applicable.
- i) Lateral earth pressure diagrams for the proposed building and site retaining walls designed with restricted and unrestricted rotation at the top of the wall
- j) Determination as to whether on-site material will be suitable for use in control fills, and the extent to which acceptable on-site materials will be available and if off-site borrows will be required.
- k) Site specific seismic classification per IBC 2012.
- l) Recommendations for the inspection and testing of the earthwork and foundation construction.
- m) Initial feasibility testing for stormwater management characteristics including estimated infiltration rates based on USDA Classification per MDE.
- n) Concept design infiltration testing, per 2000 Maryland Stormwater Management manual and general recommendations for Stormwater Management facilities.

1.2 Limitations

This geotechnical study has been prepared in accordance with generally accepted geotechnical engineering practices. It is intended for the exclusive use of Murphy & Dittenhafer Architects for the design and construction of the proposed residential building and site work as described herein. This report includes both factual and interpreted information. Factual information is defined as objective data based on direct observations, such as soil samples and laboratory testing results. Interpreted information or geotechnical engineering interpretation is based on the engineering judgment, correlation, or extrapolation from factual information.

This report is based on information for the proposed structure that was made available to us at the time of the writing of this report. No warranties, express or implied, are intended or should be assumed. D.W. Kozera, Inc. should be allowed to review the project drawings and specifications as a continuation of our design recommendations and as a precursor to our providing geotechnical engineering services during construction. In the event that any changes in the floor grades, building loads, or structure location as described in this report are planned, the conclusions and recommendations contained herein shall not be considered valid unless D.W. Kozera, Inc. reviews the changes, and either verifies or modifies the conclusions of this report in writing.

Information contained in this report is based on data obtained from limited subsurface exploration that represents the soil conditions only at the specific location and time investigated, and only to the depth penetrated. Subsurface conditions and groundwater levels at other locations or depths may differ from conditions occurring at the investigated locations. An attempt has been made to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during construction.

D.W. Kozera, Inc. considers construction observations and testing of the foundations and earthwork an integral part of the geotechnical design, and therefore, these services should be provided by the Geotechnical Engineer of Record (GER). This is necessary so that we may modify our assumptions and recommendations based on actual conditions that are exposed during construction and observed by us. We cannot assume responsibility or liability for the adequacy of our foundation recommendations if we do not observe the construction.

1.3 Site Description

The site is located at 500 Compass Rd, Middle River Maryland. A site Vicinity Map is included in Appendix A. Currently there is an existing one story brick school building, asphalt driveways and parking lots. The finished floor elevation of the existing one story building is approximately EL + 48±. The site grade slopes up gently from south to north with a change in ground surface elevation of EL + 57± to EL + 40±. The north and northwest part of the site are wooded. There are three existing parking lots located at south, northeast and northwest of the existing building. The south parking lot can be accessed from Compass Rd and Honey Comb Rd. The surface elevation of this parking lot is approximately EL + 45.5±. The northeast parking lot, accessed from the Compass Rd, has surface elevation of approximately EL + 42±. The northwest parking lot accessed from Honey Comb Rd, has surface elevation varying from EL + 39± to EL + 42±.

1.4 Proposed Construction

Based on the data provided to us, it is our understanding that the planned School Building will have a finish floor elevation of EL + 48±. The proposed School Building is to be constructed by demolishing the existing one story brick building. Carroll Engineering, Inc. has provided maximum column loads of approximately 200 kips and exterior wall loads of approximately 2.5 klf for the proposed building. Asphalt parking areas are planned on the south and northwest side of the site. Additionally, five stormwater management facilities are also planned. Two facilities will be located in the northeast part of the site, the other three are planned on southwest and south side of the site.

1.5 Regional Geology

The site is located within the Atlantic Coastal Plain Physiographic Province which is characterized by marine and terrestrial sediments deposited during successive periods of fluctuating sea level and moving shorelines. Many depositional environments existed during the formation of the Coastal Plain. Glacially influenced marine transgressions and regressions, periods of erosion and deposition, fluvial processes, and structural deformations have all played a part in the evolution of the Coastal Plain. As a result of these varying processes, the presence, thickness, and lateral continuity of geologic formations are highly variable.

Available general geological information indicates that the soils below the site consist of Lower Cretaceous-aged Potomac Group Arundel Formation. This formation consists of gray, brown, black and red kaolinitic and illitic clays with locally interbedded quartz silt or sand lenses and pods. The clays are typically poorly bedded to massive with occasional and/or lignitized wood. Deposition occurred primarily within a flood plain-back swamp complex with variable sediment input. Lower Cretaceous-aged Potomac Group Patuxent Formation of sand facies are expected to exist below the Arundel Formation but above the Residual Soils and Crystalline Rocks.

Based on the test borings, the site specific geology suggests that underlying the man-made fill (2 to 9 feet deep) stiff clays of the Cretaceous-Age Potomac Group extend to the top of the residual profile. Even though, the test borings do not extend beyond the Potomac Group soils, the underlying bedrock is believed to be crystalline bedrock and expected to be encountered at a depth of over 50 feet based on available geologic maps.

2.0 SUBSURFACE INVESTIGATION

2.1 Field Investigation

The subsurface investigation was performed from March 16 to March 24, 2016. It included drilling a total of thirteen test borings to depths of 10 to 30 feet below existing grade. Eight of the test borings were for the building structure, the remaining five test borings were for stormwater management facilities and pavements. Three of the test borings were drilled on the existing paved areas. The locations of the soil test borings are shown on the Boring Location Plan, Appendix A. The borings were drilled using a truck-mounted drill rig which has automatic hammer to obtain SPT samples. These test borings were monitored for groundwater level during the drilling operations, at completion of drilling and after 24 hrs. The borings on the paved areas were then backfilled and patched.

2.2 Soil Test Borings

Test borings were advanced using hollow-stem augers (2-¼ inch I.D. HSA) and soil samples were recovered from the borings at selected intervals by driving a 1-3/8-inch ID (2-inch OD) split-spoon sampler in accordance with ASTM D-1586 specifications. SPT were conducted at changes in strata or at intervals not exceeding five feet. The sampler was first seated 6 inches to penetrate through the loose cuttings and then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated as the Standard Penetration Resistance (N) value. Soils obtained from the sampling device were sealed in glass sample jars and transported to soils testing laboratory. The recovered soil samples were inspected and classified by a Geotechnical Engineer using the ASTM Soil Classification System (ASTM D 2487). A description of the soils and conditions encountered at each test boring location are presented on the Boring Logs and are included in Appendix A.

2.3 Groundwater Conditions

Groundwater levels were noted in each of the borings during drilling operations, immediately and after 24 hours of completion of drilling. Groundwater was observed on the drill rods and samples during drilling operations in all of the test borings. Groundwater readings at the end of drilling and after the HSA auger is pulled out were noted. The test borings were left open for the stabilized groundwater readings. The groundwater depth and the corresponding groundwater reading time were recorded. These are included in the boring logs which are attached in Appendix A. The groundwater is approximately 4 to 10 feet below the existing grade (i.e. EL + 43± to EL + 38±). It should be noted that groundwater levels will fluctuate due to seasonal changes, precipitation, and construction activity.

2.4 Soil Laboratory Testing

Soil samples recovered from the field explorations were transported to laboratory and selected soil samples were tested to determine additional engineering characteristics of the existing on-site soils. Laboratory tests conducted on the selected soil samples include: natural moisture content (ASTM D2216), Atterberg limits (ASTM D4318), sieve analysis (ASTM D422), modified Proctor (ASTM D1557), California Bearing Ratio-CBR (ASTM D1883) and USDA Classification.

Six samples from the project area were tested for classification purposes, per the appropriate ASTM standards. The soils were found to predominantly classify as LEAN CLAY (CL). One bulk sample from the proposed paving areas was tested for Moisture vs. Density and California Bearing Ratio. This sample was found to be classify as FAT CLAY (CH) and has significant swell potential. The results of the soils laboratory testing are included in Appendix B.

Based on the liquidity indexes, the Potomac Formation soils tested appear to be slightly overconsolidated to highly overconsolidated, and hence will have a relatively small compressibility settlements due to the

loads from the proposed structure. However, the Atterberg limits indicate that these soils will swell and shrink significantly due to change of moisture contents.

3.0 SUBSURFACE CONDITIONS

3.1 Stratification

The Boring Logs included in Appendix A contain details related to the subsurface conditions encountered at the test boring locations. Stratification lines shown on the Boring Logs and the Generalized Subsurface Profile in Appendix A represent approximate transitions between material types. Strata changes can occur gradually or at different levels than those shown on the Boring Logs that depict conditions at the specific indicated locations and depths at the time of our subsurface exploration program. Groundwater levels are variable and are influenced by the existing soil conditions, seasonal and climatic changes. The test boring data, visual and laboratory classification of the sampled soils, and our knowledge of the local geology was used to separate the soils into two strata, having the following generalized properties.

3.1.1 Stratum A: Man-Placed Fill

Man-placed fill was encountered in all of the thirteen test borings. The fill material was observed to consist of predominantly Sandy Lean Clay. Silty SAND, Poorly Graded SAND and cinders with trace gravel size crushed stone were also observed in some test borings. The fill appears to have been placed during past construction and grading activities at the site. The fill stratum extended to depths ranging from 2 ft. to 9 ft. below existing grade. The penetration resistance in the fill indicated a generally low to medium density with standard penetration resistance (SPT) N-values ranging from 5 blows per foot (BPF) to 13 BPF.

3.1.2 Stratum B: Potomac Group

Deposits from the Cretaceous-age Potomac Group were encountered below the man-placed fill soils to the bottom depths of the test borings, 30 feet below the ground surface. The density of these soils varied within the profile, with SPT values of 4 BPF to 25 BPF. These soils were predominantly classified as LEAN CLAY (CL), but also contain layers of SANDY LEAN CLAY (CL). Some of the clay soils classify as FAT CLAY (CH). These soils are expected to have high swell and shrink characteristics when the moisture content is affected by wetting and drying. Lignite was also encountered in test borings B4, B5 and SWM4 at approximately EL + 24±. The lignite is not expected to cause any foundation issues for the proposed structure.

4.0 SEISMIC CONSIDERATIONS AND SITE CLASS

This section presents the testing and analysis conducted to evaluate the liquefaction potential of the soils; and the seismic site class for this project site per 2015 International Building Code (IBC).

4.1 Liquefaction Potential

Liquefaction typically occurs in loose cohesionless sands and silts located below the water table. The test borings did not encounter these conditions, and therefore a liquefaction analysis is not warranted.

4.2 IBC 2012 Seismic Site Class and Design Parameters

Seismic design parameters were determined in accordance with the 2012 International Building Code (IBC). The "U.S. Seismic Design Maps-Earthquake Hazards Program" is used to get mapped acceleration parameters for the site with coordinates 39.34152°N, 76.45623°W. Table 4-1 has these parameters.

Description	Period (Sec)	S _a
Mapped Short Period Spectral Response Acceleration (S _s)	0.2	0.136 g
Mapped 1-Second Period Spectral Response Acceleration (S ₁)	1.0	0.052 g

The Seismic Site Classification influences the determination of the Site Coefficients, the Design Spectral Response Acceleration values, and ultimately the Seismic Design Category. Note that the Seismic Site Classification is based on the characteristics of the upper 100-feet of soils and rock below the site. The IBC requires the use of Standard Penetration Test Resistance (test borings), Shear Wave Velocity (geophysical methods), and/or Undrained Shear Strength (soil laboratory testing) to categorize the Seismic Site Classification.

Based on the explored soil properties in the test borings performed for this site, the Seismic Site Classification was determined to be Site Class D. For Site Class D and mapped spectral acceleration values obtained above, calculated Site Coefficient values and the Maximum and Design Spectral Response Acceleration values as per IBC Section 1613.5 are given in Table 4-2.

Site Class	D
Soil Profile	Stiff Soil Profile
Site Coefficient (F _a)	1.6
Site Coefficient (F _v)	2.4
Short Period, Maximum Spectral Response Acceleration (S _{MS})	0.217 g
1 Second Period, Maximum Spectral Response Acceleration (S _{M1})	0.125 g
Short Period, Design Spectral Response Acceleration (S _{DS})	0.145 g
1 Second Period, Design Spectral Response Acceleration (S _{D1})	0.083 g

Design spectral response acceleration values are used with occupancy category (IBC 2012, Table 1604.5) of the building or structure to determine the Seismic Design Category. Complete results of Spectral Acceleration with varying period are given in Appendix C.

5.0 EARTHWORK

5.1 Discussion

Based on the Existing Conditions Plan dated February 26, 2016, and a proposed finished floor elevation of EL + 48±, generally less than 3 feet of compacted fill will be required to achieve the proposed grade. Up to 6 feet of fill is required in the northwest and northeast corners of the building to reach proposed floor grades. Cuts of up 4 feet are generally anticipated to reach exterior site and pavement grades.

Careful subgrade preparation, including stripping of existing asphalt, organic layers, and/or soft surface soils, is required to prepare a suitable fill subgrade. Earthwork is recommended to take place in the warmer, drier months between May and October. The use of scarification and drying techniques, or additives such as quick lime, kiln dust, fly ash, or Portland cement may also be useful in expediting fill operations in inclement weather. Existing fill soils must be densified after stripping of the site. It is expected that some undercutting of existing fill soils will be required to prepare a suitable site.

5.2 Excavation Characteristics

Demolition techniques, such as hoe ramming, may be required for the removal of the existing walkways and existing structures. After removal of these previously existing structures, the excavation of this site is expected to be performed using conventional earthmoving equipment. The existing structures, including floor slabs and foundations should be removed during demolition. Careful preparation of fill subgrades, proper placement and compaction of structural fill and backfill are both necessary to prepare a suitable site for the support of the proposed structures. Details of these requirements are included in the following sections.

5.3 Fill Subgrade Preparation

All vegetation, pavements, and topsoil located below proposed structures should be removed from the fill subgrades prior to filling. The fill subgrades should be proofrolled to assure that all unsuitable, soft and loose soils have been removed under the areas to be filled. Fill subgrades consisting of existing fill soils, should be densified with a 20-ton vibratory smooth drum roller traveling at a speed of less than 2 feet per second. A minimum of 10 passes, 5 passes in one direction, and 5 passes perpendicular to the original direction, should be made with the roller. After densification, the fill subgrades should be proofrolled to assure that all unsuitable, soft and loose soils have been removed from below the building and pavement areas. During proofrolling, the subgrades should be observed by a Geotechnical Engineer of Record. Any unsuitable soils that are observed to be excessively settling or to be bumping during proofrolling, should be removed down to firm soils and then replaced with satisfactory soils compacted in accordance with the project specifications.

The site soils below the existing fill are predominantly classified as LEAN CLAY (CL) with a liquid limit greater than 40 and a plasticity index greater than 15, indicating that they may be susceptible to shrink/swell conditions. Care must be taken to protect fill subgrades during construction. The on-site soils are expected to become unstable in wet weather and under construction traffic. Undercutting of floor and fill subgrades should be expected if the subgrades are exposed to the above events. The Project Specifications should require the contractor be responsible for protecting the subgrades from weather and equipment damage.

As a separate demolition package is to be issued prior to building construction, it is critical that the building, pavement and compacted fill subgrades be protected. The underlying clay soils at the site are known to have significant shrink and swell characteristics. For the proper performance of floor slabs and pavements, it is critical that the underlying clay soils not be exposed to either drying or wetting. This can be accomplished by leaving 12 inches of existing soil above subgrade to future cut areas or by placing 12 inches of compacted fill above future fill areas. Alternatively, the site can be graded to the required building, pavement and compacted fill subgrades immediately after demolition of the existing school, and

then the top 12 inches of the existing clay soils at the required subgrades can be treated by cement. The use of a soil cement treatment using 5% cement by weight can be used for budgeting purposes.

5.4 Compacted Structural Fill

Fill Materials:

Compacted structural fill and backfill for use beneath site structures, such as backfill of foundation walls and interior foundations, and fills in the top 24 inches beneath pavements and sidewalks, should consist of satisfactory soils classified as SM or better in accordance with the Unified Soil Classification System, ASTM D2487. Soils meeting this requirement are classified as SM, SP, SW, GM, GP, and GW. Soils used for compacted fill should be free of unsuitable materials such as topsoil and other organics, rubble, and rocks larger than 3 inches in diameter. The on-site soils are not expected to meet this requirement and should not be used as structural fill in the areas indicated above. Unsatisfactory soils are those classified as ML, CL, OL, OH, MH and CH. SC and GC material may be used if it has less than 35% fines and a plasticity index (PI) less than 15. The use of offsite borrow will be required for backfilling of foundation walls, interior foundations, new compacted fill in the top 24 inches beneath pavements, and any new fill required beneath floor slabs. The onsite material may be used to backfill utilities and SWM facilities, up to 24 inches below pavements and sidewalks, provided that it classifies as CL or better.

Fill Compaction:

Compacted fill should be placed on subgrades which have first been stripped of vegetation, existing asphalt, topsoil, and unsuitable soft soils. Compacted structural fill should be placed in approximately horizontal layers, each layer having a loose thickness of not more than 8 inches. All structural fill should be compacted to 95 percent of the maximum dry density in accordance with ASTM D698, Standard Proctor. Compacted fill in lawns and unpaved areas may be compacted to 90 percent of the same standard, when placed as indicated above. On site material may be utilized in lawn areas and up to 24 inches below pavements. The onsite materials are expected to be difficult to work with due to their elevated moisture content. The contractor should select appropriate compaction equipment to achieve the required compaction.

The in-place moisture content of the satisfactory fill soils material shall be adjusted by the contractor thoroughly by wetting or drying, to within 3 percent of the optimum moisture content. Moisture conditioning of these soils may be required depending on the time of the year the fill is placed. Most of the on-site soils are expected to have moisture contents above the optimum for compaction, and depending on the time of year of construction, it may prove difficult to economically moisture condition the on-site soils and offsite borrow material may be required for fills.

All fill placement and compaction operations in critical areas (i.e., structural areas) should be monitored by an experienced Soils Inspector on a full-time basis to ensure that fill materials are being placed and compacted in compliance with the Project Specifications. Should any compaction problems arise during grading operations, the Geotechnical Engineer should be consulted.

5.5 Utility Backfill

Although typically not part of the design consideration, it is imperative that any new utility lines which enter or exit the building be backfilled filled with flowable fill. The purpose of this flowable fill is to cut off any water source into the underlying clay below the new structure. By placing a relatively impermeable fill, in lieu of the often used open graded (No. 57) stone, the introduction of surface water through utility trenches to the clay soils below the building can also be minimized.

5.6 Backfill of Foundations

It is recommended that the exterior side of exterior foundation walls and footings be backfilled with on-site material or flowable fill to within 12 inches of final exterior grades. Final grading shall be performed to direct surface water away from the building. These precautions are to help minimize the infiltration of surface water to the clay foundation subgrades.

6.0 FOUNDATION DESIGN

The geotechnical analysis for foundation design is based on the results of the test borings, laboratory tests, and our experience with similar geologic conditions. As provided by Carroll Engineering, Inc., the maximum unfactored wall footing load will be in the range of 2.5 kips/ft. and the maximum total unfactored column load will be approximately 200 kips for the proposed school building. Based on the data provided to us, it is our understanding that the School Building is planned to have its finished floor at an elevation EL + 48±.

Conventional spread footings are feasible to support the loads from the proposed structure. Based on a proposed finished floor elevation of EL + 48±, existing fill soils and natural soils of the Potomac Group are expected to be encountered at foundation grades. The clay soils at the site are known to have a swell-shrink potential and all footings should be placed at least 48 inches below final exterior grade to minimize the seasonal effect of the wetting and drying of the clay soils.

The existing fill soils are not suitable for support of the foundations and must be undercut to suitable natural soils and backfilled with structural fill as per Section 5.4 and Section 6.2 to the foundation grade. Alternatively, the undercut subgrade may be backfilled with lean concrete, allowing the footing to be placed at the designed elevation.

The total foundation settlement of less than one inch, and distortional settlement of 0.002 in/in are expected when spread footings are placed in accordance with the recommendations provided in this report.

6.1 Spread Footings on Natural Soils

An allowable soil bearing pressure of 2.5 ksf is recommended for footings founded on the natural soils of Stratum B. Based on the test borings performed in the building area; these suitable soils are expected to be encountered at foundation grades. During excavation for footings, some unsuitable loose natural soils or existing fill soils may be encountered, which must be removed by undercutting. The footing should be placed directly on the lowered subgrade. Alternatively, the undercut subgrade may be backfilled with lean concrete allowing the footing to be placed at the designed elevation.

6.2 Spread Footings on Compacted Fill

In areas where the Man-placed fill soils of Stratum A are encountered, the footings should be undercut to a minimum depth of 1B for square footings and 2B for strip footings, where B is equal to the footing width. If suitable natural soils are encountered prior to reaching the minimum depth indicated above, the undercut may be stopped. The resulting undercut excavation should be backfilled with new compacted structural fill. A design soil bearing pressure of 2.5 ksf is recommended for these lightly loaded footings founded on newly placed compacted structural fill when installed as described herein.

6.3 Spread Footings - General

All footings should be at least 16 inches wide for shear considerations and a maximum slope of 2H:1V should be maintained between the bottom edges of adjacent footings where foundation grades are at different levels. All footings should be placed at least 48 inches below final exterior grade. Hand cleaning of the footing subgrades will be required to remove disturbed soils. This may occur from the backhoe excavation, ponding of water, trench collapse, etc. Footing subgrades may consist of LEAN CLAY (CL) and FAT CLAY (CH) materials which are subject to volume changes due to changes in moisture content; therefore, footings must be excavated and poured in the same day in order to minimize wetting or drying (causing swelling or shrinking) of the subgrade soils. The suitability of footing subgrades should be evaluated during construction by a Geotechnical Engineer from our office.

7.0 FLOOR SLAB

7.1 Floor Slab Support

The floor slab subgrades are expected to consist of natural soils, existing fills or newly placed compacted structural fill. These on-site clay soils are highly susceptible to volume changes if subjected to wetting or drying. For this reason, a very specific construction sequence is recommended for the floor slab installation. This sequence should be as follows:

- a) Excavate to within 12 inches above the proposed finished floor under-slab stone subgrade elevation to allow installation of footings and utilities.
- b) Immediately prior to pouring the floor slab, excavate to 12 inches below the proposed floor slab stone subgrade and cover with a layer of polyethylene sheeting having a minimum thickness of 10 mil.
- c) Place a minimum of 12 inches of granular compacted structural fill or crushed stone to reach the elevation of the open-graded stone subgrade beneath the floor slab.
- d) Place 4 inches of open graded stone (No. 57 size) as a capillary break, place floor reinforcing steel, and pour the concrete floor slab.

Alternatively, the floor slab subgrade can be treated with a 5% soil cement to a depth of 12 inches immediately after bringing the soil to subgrade elevation. The 4 inches of open graded stone and floor slab can then be placed on the cement modified soil.

Floor slabs on grade may be designed using a modulus of subgrade reaction, k equal to 120 pci. Groundwater is estimated to be greater than 5 feet below the proposed finished floor grades and a special under-floor subdrainage system is not considered necessary.

8.0 RETAINING WALLS, SUPPORT OF EXCAVATION AND LATERAL EARTH PRESSURES

8.1 Discussion

Based on the proposed finished floor elevation of EL + 48± and existing ground surface elevation of the site, no supported excavations are anticipated for this project. Therefore, no support of excavation should be required for the proposed building construction, however support of excavation may be required for utility installation.

8.2 Braced and Cantilevered Walls

For any utility rooms, perimeter walls, site grading, and ramps retaining walls will be required to retain backfill. These walls must be designed to resist lateral earth pressures developed from the surrounding soils and any surcharge. Recommended pressure diagrams for the design of retaining walls are included as Figure 8.1 and Figure 8.2. These pressure diagrams include earth pressures developed from backfill placed behind the walls.

Compacted fill behind and in front of the walls should be free of organics and rocks larger than 3 inches in diameter, and should consist of soils classifying SM or better. Compacted fill should be placed in accordance with the recommendations provided in Section 5.4 of this report. Compaction equipment exceeding 3,000 pounds in dead weight should not be used within five feet of the walls during backfilling in order to avoid overloading the walls. All walls should be braced prior to backfilling unless they are designed to be cantilevered.

Wall Type	Soil Class	Unit Weight (pcf)	Passive Soil Pressure (psf)	Soil Pressure (psf)	Sliding Resistance (psf)	Friction Angle (Degree)
Braced	SM	120	---	60H (at rest)	0.35W	30
Cantilevered	SM	120	360D	40H (active)	0.35W	30

H = Height of Wall (ft.) - Active Side
W = Weight of Wall (lbs.)
D = Depth of Wall (ft.) – Passive Side
Note: Disregard the upper 24 inches of Passive Pressure

The at-rest pressure can be used if backfill is compacted against walls that are braced at the top and bottom, and the active condition can be used if the walls are designed to be cantilevered. The ponding of precipitation behind the walls should be avoided during construction as the pressure diagrams included do not include hydrostatic pressure. Conventional foundation subdrainage or weep holes should be used to prevent buildup of hydrostatic pressure behind walls. Any vertical surcharge load from temporary construction equipment should be added to the lateral earth pressure with a rectangular force diagram as indicated in the Earth Pressure Diagrams, Figure 8.1 and Figure 8.2. The surcharge load from temporary construction equipment should be a minimum of 250 psf. A Factor of Safety of at least 1.5 should be used for evaluation of overturning and sliding of the walls using the parameters indicated on the lateral earth pressure diagrams.

Specific material and compaction requirements for fill against walls below grade are included in Section 5.4. Compacted fill behind and in front of the walls should be free of organics and rocks larger than 3 inches in diameter, and should consist of soils classifying SM or coarser. Compaction equipment exceeding 3,000 pounds in dead weight should not be used within five feet of the walls in order to avoid overloading the walls. All building walls should be braced prior to backfilling, unless they are designed to be cantilevered walls.

8.3 Temporary Sloped Excavations

Sloped excavations for utility installations may be used on the project site where excavation depth is shallow, the extent of excavation is small, and ground movements as a result of excavation would not impact the performance of existing structures and utilities. The Occupational Safety and Health Administration (OSHA) Technical Manual (OTM) Section V, Chapter 2, "Excavations: Hazard Recognition in Trenching and Shoring," provides guidelines that should be followed to ensure a safe excavation. The soils found on site can be considered Type C in accordance with the OTM; therefore, excavations of up to 20 feet deep with slopes of 1.5 H:1 V are permitted above the groundwater table. All sloped faces should be covered with polyethylene sheeting to minimize wetting and/or drying of the soils on the slope. Sloped excavations below the groundwater table are not recommended, and mechanical excavation support systems should be used if excavations extend below the groundwater table.

9.0 PAVEMENT DESIGN

9.1 Discussion

It is our understanding that an asphalt driveway and parking areas on the north and west side of the building are planned. Pavement subgrades are expected to consist of recompacted existing fill soils and newly placed compacted structural fill. Due to the shrink/swell characteristics of the existing fill and natural clay soils, it is recommended that pavement subgrades consist of a minimum of 12 inches of material classifying as SM or better; therefore, pavement subgrades consisting of natural soils or existing fill soils are expected to be undercut 12 inches and replaced with compacted structural fill. An alternative to this undercut and replace method beneath the pavements would be to treat the top 12 inches of the pavement subgrades through cement modification. Laboratory testing of the on-site materials will be required to determine the appropriate amount of cement necessary, but 5% cement by weight is considered reasonable for budgeting purposes. Pavement sections presented here are for light-duty (automobile only) and medium-duty sections.

9.2 Pavement Subgrade Preparation

Due to the expansive nature of the clay soils on the site, pavement and sidewalk subgrades are to consist of a minimum of 12 inches of granular material, classified as SM or better, or a minimum of 12 inches of cement-modified material. Careful subgrade preparation, including the stripping of existing topsoil and organic layers, and re-compaction and proofrolling, is strongly recommended. All subgrades should be proofrolled with a loaded 20-ton dump truck, and any unsuitable soft or loose areas detected should be removed and replaced with satisfactory compacted fill or stone base course. Some undercutting of unsuitable soils should be expected, in order to produce a pavement subgrade suitable for the pavement design provided below. The pavement subgrades on the site are expected to consist of natural clay materials which are prone to volume changes due to changes in moisture content; and therefore, care must be taken during construction to minimize wetting or drying (causing swelling or shrinking) of the subgrade soils. It is recommended that the stone base course be placed immediately after proofrolling in order to protect the subgrades. Compacted fill placed for pavement support should be placed in accordance with the recommendations contained in Section 5.4 of this report. The pavement subgrades should be inspected carefully to determine if the soils meet the soil classification that is used in our analysis.

9.3 Flexible Pavement Design/Analysis

Parking areas and driveways will be used to support automobiles, and light delivery trucks. A light-duty pavement section may be used in areas that will be restricted to be used solely by automobiles. Parking lot access roads and entrances that may be used by heavier vehicles should be designed as medium-duty, including the expected routes to be used by delivery and trash trucks.

Soil laboratory testing for the on-site soils indicated a CBR value of 2 and a 10.8% swell for the FAT CLAY soils taken at Boring P1. This CBR value is generally considered as "poor" for pavement support. In order to account for other areas of poorer quality soils, the laboratory CBR value was reduced by a factor of 0.67 to yield a design CBR value of 1.3 per AASTO recommendation. This design CBR value was used for our analysis.

Layers	Light-Duty Pavement 50,000 ESAL	Medium-Duty Pavement 400,000 ESAL
Asphalt Surface Course	1.5"	2.0"
Asphalt Base Course	2.5"	3.0"
Stone Base Course	8.0"	10.0"
SM Subbase/soil-cement	12.0"	12.0"

The bituminous concrete surface and base course material should be selected by the civil engineer to provide a stable and relatively impervious pavement section. The stone base course should meet the specifications of MSHA GA Base, and be compacted to at least 95 percent of the maximum dry density per AASHTO T180. The SM or better subbase consists of a firm and unyielding soil subbase compacted to a 95% minimum dry density as per AASHTO T180. Note that a minimum of 12 inches of cement-modified onsite material can substitute the 12 inches of "SM or better" subbase.

9.3.1 Pavements During Construction

The recommended flexible pavement sections for light duty pavement are not designed to accommodate construction traffic. It should be expected that damage will occur due to overloading of the pavement sections if they are subjected to construction traffic. This will be prevalent especially if water is allowed to collect on or in the pavement subgrades, and if only the base course is placed prior to the completion of the construction. Provisions should be made to minimize damage to the pavements during construction including the use of subdrainage, temporary swales or berms, the limitation of construction traffic to certain areas, and/or an increased thickness of stone or base asphalt. An allowance should be reserved for the cost of repairs to the base paving prior to completion of the final surface-course of asphalt.

The pavement design assumes that a continual maintenance program will be implemented during the service life of the project. This should include crack and surface sealing, and patching of deteriorated areas.

9.4 Rigid Pavement Design/Analysis

A rigid concrete pavement should be used in areas of concentrated, repeated, heavy wheel loads such as in front of dumpsters, bus loading areas, and in areas of tight turning radii and braking, where excessive wheel shearing forces could damage a flexible pavement.

We recommend a rigid section of 8 inches thick Reinforced Portland Cement Concrete (RPCC) placed on 8 inches thick compacted Dense Graded Aggregate over a minimum of 12 inches of granular material, classified as SM or better, or a minimum of 12 inches of cement-modified on site clay material. The concrete should be of 4,000 psi, air entrained and reinforced with a minimum of 6x6, W2.9xW2.9, welded wire fabric. Construction and expansion joints should be doweled at 12 inches o.c., with a 7/8 -inches diameter, 18 inches long smooth dowels. Joint spacing should not exceed 20 feet in any horizontal direction.

10.0 STORMWATER MANAGEMENT RECOMMENDATIONS

10.1 Discussion

It is our understanding that micro-bioretenment areas are planned for this project. Infiltration practices are being considered for the micro-bioretenment areas. Initial infiltration feasibility testing based on visual and laboratory classification was performed for this study per Maryland Stormwater Design Manual, 2000. One in-situ infiltration test was performed in the proposed micro-bioretenment areas to evaluate the infiltration characteristics of the on-site soils.

10.2 Stormwater Management Infiltration Recommendations

The Stormwater Management Administration of the Maryland Department of the Environment (MDE) has set particular standards and specifications for the design and construction of stormwater infiltration devices. These regulations include parameters on soil textures, depth of limiting zone, and other considerations, which are described in the publication "Maryland Stormwater Design Manual, 2000."

Appendix D.1 of the MDE manual describes geotechnical testing requirements prior to the final design of a stormwater management facility. The manual requires *initial feasibility testing* to determine the likelihood of using infiltration characteristics for stormwater management. If infiltration appears feasible based on the initial testing, then *concept design testing* is required to approximate actual infiltration rates. Concept design testing consists of in-situ infiltration testing of the proposed bottom of the facility. Initial feasibility testing based on visual and laboratory classification was performed for this study in the proposed stormwater management areas, and indicated that the use of stormwater infiltration may be an acceptable practice at limited horizons below the proposed locations based on soil classification and limiting zones of bedrock and depth to groundwater. The following analyses were performed to confirm these opinions.

10.2.1 Soil Textures

The MDE publication requires USDA Soil Textural Classifications for each type of soil below the infiltration device. These classifications are used to correlate the material with typical minimum infiltration rates. The State indicates that soil textures with a minimum infiltration rate of greater than 0.52 inches per hour are required for infiltration devices, which include loam, sandy loam, loamy sand, and sand.

USDA testing was performed on three representative samples obtained from the borings located within the stormwater management areas. The infiltration tests were conducted at depths below the existing fill soils. The testing indicated that the samples classify as SILTY CLAY LOAM and LOAM. These classifications correlate to minimum infiltration rates of 0.06, and 0.52 inches per hour, respectively. The LOAM soils corresponding to Boring SWM 4 and SWM 5 are considered suitable for infiltration practices. However, the SILTY CLAY LOAM soil encountered at Boring SWM 3 is considered not suitable for infiltration practices.

10.2.2 Depth to Limiting Zone

The MDE publication recommends that a four-foot distance be provided between the bottom of the infiltration system and any limiting zones. Limiting zones are defined as a seasonal high water table or bedrock. Founding of infiltration facilities within existing fill soils is also prohibited, in accordance with the publication. Groundwater was encountered at approximately 5 to 8 feet below the ground surface. The bedrock was not encountered to 30 feet below the ground surface, the maximum depth of the test borings.

10.2.3 In-situ Infiltration Tests Results and Summary

Three in-situ infiltration tests were done at the micro-bioretention areas as per Appendix D.1 of the MDE manual. Details of the in-situ infiltration test results are included in Appendix A. The following table summarizes results of testing and our observations.

Test Boring	Test Boring Depth (ft)	Existing Grade (EL±)	Test Depth (ft)	Ground Water Elev. (EL±)	USDA Classification at Test Depth	USDA Predicted Infiltration (in/hr)	Measured In-Situ Infiltration (in/hr)	Remarks
SWM-3	15	+ 45	5	+ 38	SILTY CLAY LOAM	0.06	0.0	1, 2
SWM-4	15	+ 40	5	+ 35	LOAM	0.52	0.0	1, 2
SWM-5	15	+ 43	5	+ 35	LOAM	0.52	0.0	1, 3
1. Measured infiltration rate below that required by MDE for infiltration practices 2. Groundwater within 4 feet of test depth 3. Groundwater elevation based on caved depth.								

10.2.4 Remarks

Infiltration practices are not recommended due to the low in-situ infiltration rates measured and shallow groundwater table.

11.0 CONSTRUCTION CONSIDERATIONS

Specific recommendations for foundation construction are given below:

11.1 Earthwork

Recommendations contained in Section 5.3 should be used to protect the soil subgrade immediately after demolition to minimize future shrink-swell of the underlying clays. During construction, the work areas should be stripped of existing surface soils provided cement was not used to treat the top 12 inches of the clay soils as a protection of the subgrade. The resulting subgrades should be proofrolled under the observation of our representative. Any soft or unsuitable soils encountered should be removed and replaced with compacted fill. Abandoned underground utilities must be removed and replaced with compacted structural fill. Where excavations made for utility abandonment, demolition, or new utility installation trenches will intersect new footing subgrades, the excavation shall be replaced with lean concrete or compacted structural fill.

11.2 Spread Footings

Care should be exercised during the excavation for all footings to minimize disturbance of the footing and fill subgrades. The natural clay soils at the site are highly susceptible to shrink and swell due to drying and wetting. If subgrades are disturbed, the subgrades should be lowered to undisturbed soils. Footings should be excavated and concreted the same day in order to avoid ponding of surface runoff water in footing excavations and to avoid other disturbances such as freezing, extreme moisture variations (wetting or drying), etc. A mud mat consisting of two inches of lean concrete may be placed to preserve the subgrades after the subgrade is approved by an engineer from our office. Hand cleaning of the disturbed soils left by the backhoe excavation will be required to produce a minimally disturbed subgrade. A flat-bladed excavation bucket will help to minimize the hand work.

11.3 Compacted Structural Fill

Compacted fill should meet the requirements outlined in this report. All compacted structural fill and backfill below pavements, slabs, and as backfill behind foundation walls should be compacted to 95 percent of the maximum dry density per ASTM D698, Standard Proctor. Compacted fill directly beneath pavements shall be compacted to 100% of the same standard. Moisture conditioning, such as wetting or drying, should be expected to be required depending on the time of year construction occurs. However, due to the clay soils on site, it is highly recommended that earthwork be performed in the warmer, drier months between April and November. Soil additives such as lime, cement or kiln dust may be used to expedite compaction in soils above the optimum moisture for compaction. Note that the on-site soils are not expected to be suitable for reuse as compacted fill and off site borrow material will be required.

11.4 Review of Construction Documents

Any deviation to the project design subsequent to the date of this report, such as changes in floor grades, building loads and building location, should be brought to our attention to determine if our recommendations contained herein remain valid.

The information provided in this report may be used to produce project drawings and specifications. We should be allowed to review the project drawings and specifications, as a follow-up to our design recommendations and as a precursor to our providing the geotechnical engineering services during construction.

11.5 Construction Observations and Testing

Regardless of the thoroughness of a geotechnical engineering exploration, there is always a possibility that conditions will vary from those encountered in the test borings, that conditions are not as anticipated

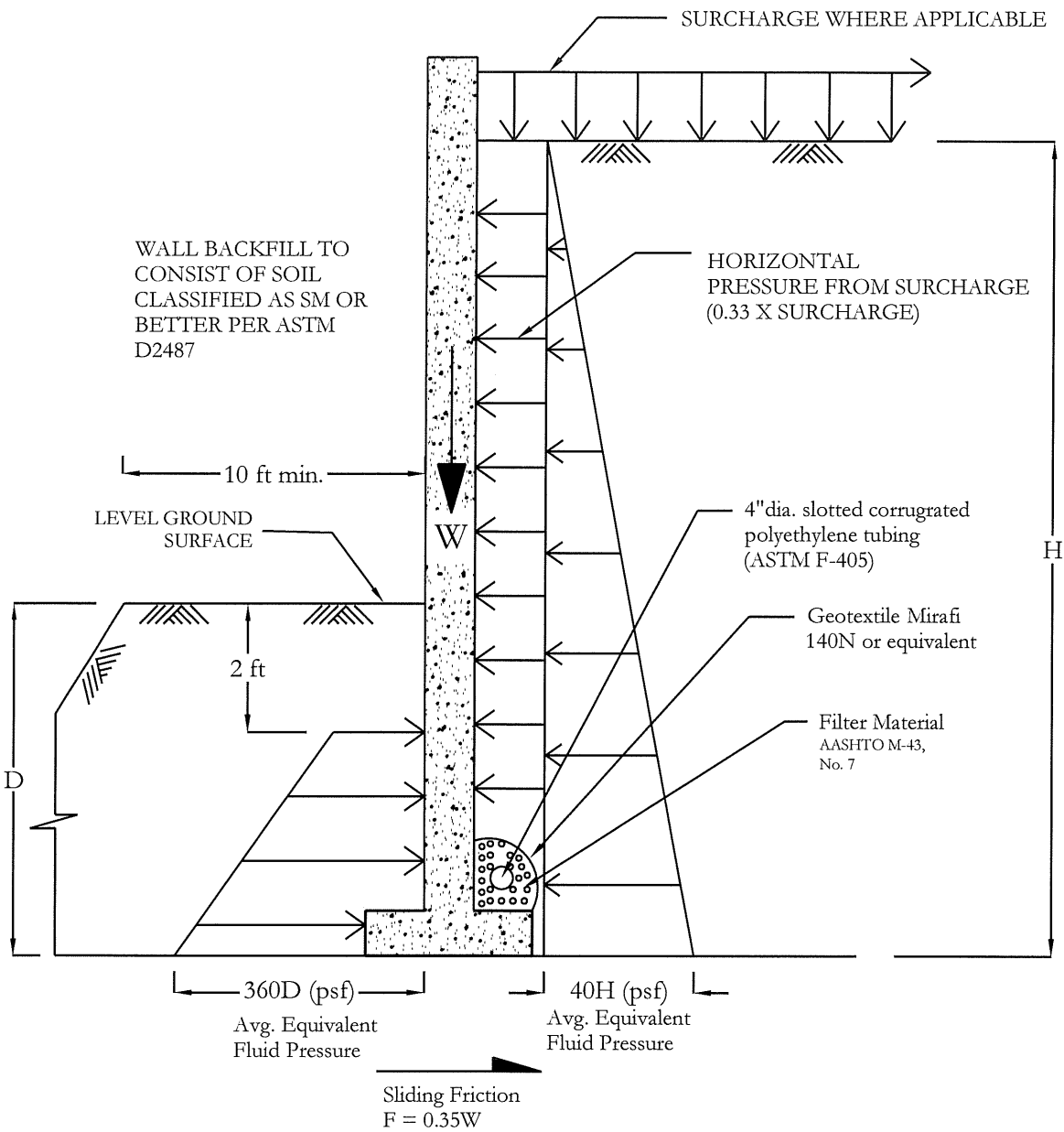
by the designers, or that the construction process has altered the soil conditions. D.W. Kozera, Inc. considers construction observation and testing of the foundations and earthwork an integral part of the geotechnical design, and therefore these services should be provided by the geotechnical engineer of record. As the actual subsurface conditions are exposed and observed by us during construction, modifications to our report recommendations can be made promptly and efficiently as needed. Note that we cannot assume liability or responsibility for the adequacy of our foundation recommendations if we do not observe the foundation construction.

Observations and testing should at minimum include full-time observations of the excavation of footing, fill, and floor subgrades, and field density testing of compacted structural fill. Other services, including materials testing (concrete, reinforcing steel, bituminous concrete, masonry, etc.) can be provided upon request.

12.0 ENVIROMENTAL CONSIDERATIONS

The scope of this work did not include an environmental investigation at the site. Health and Safety issues, if any, should be determined by others.

FIGURES



CANTILEVERED WALLS

LATERAL EARTH PRESSURE DIAGRAM

D.W. KOZERA, INC.
PROFESSIONAL ENGINEERS AND GEOLOGISTS
1408 Bare Hills Rd. Baltimore, MD 21209
PH. 410.823.1060 FAX. 410.823.1062

VICTORY VILLA ELEMENTARY SCHOOL

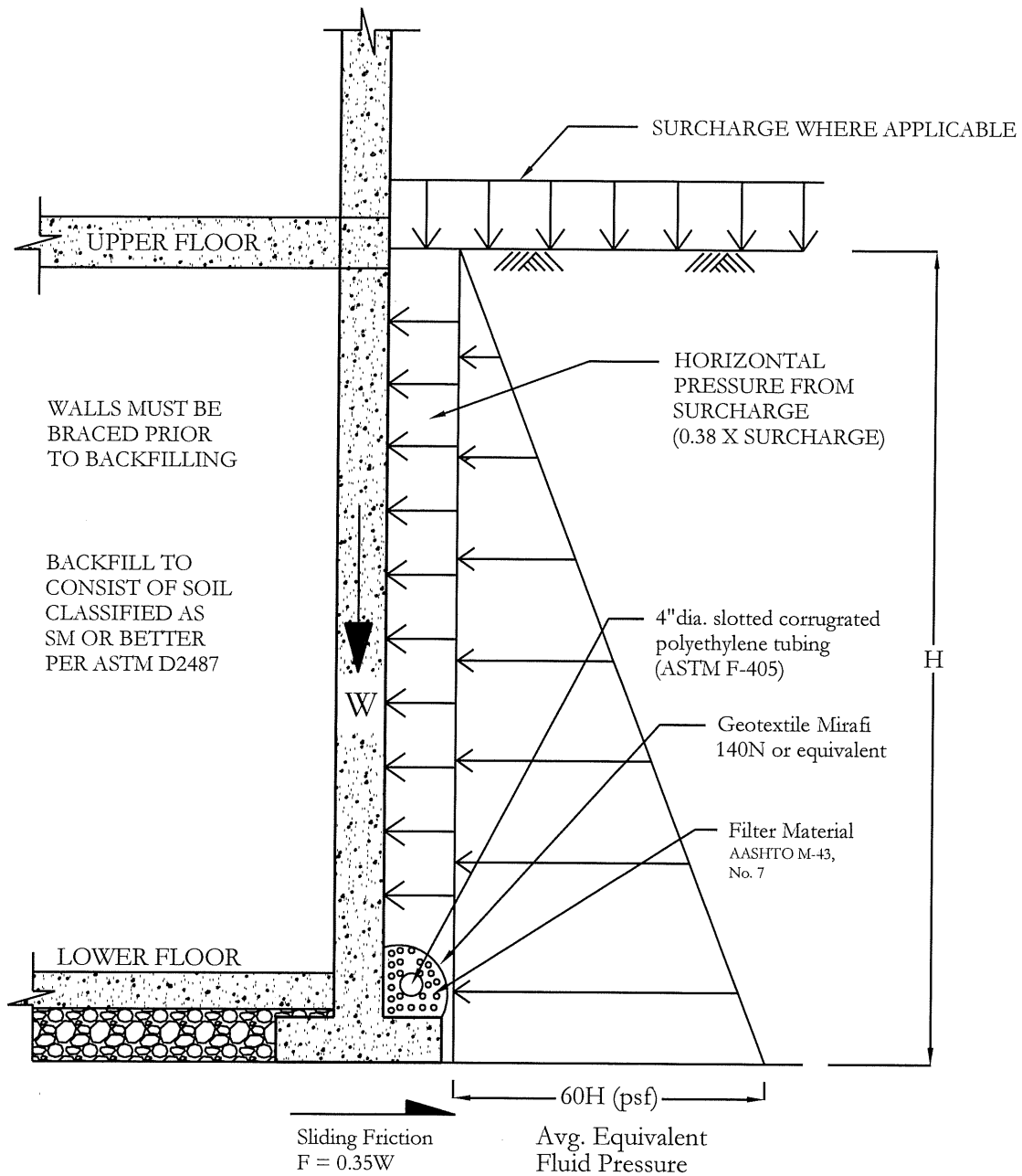
MIDDLE RIVER, MD

Proj #: 15228.D

Date: 04-08-2016

Figure: 8.1 Prep. by: AB

Scale: NTS Rev. by: DK



BRACED WALLS (BUILDING WALLS)

LATERAL EARTH PRESSURE DIAGRAM

D.W. KOZERA, INC.
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 1408 Bare Hills Rd. Baltimore, MD 21209
 PH. 410.823.1060 FAX. 410.823.1062

VICTORY VILLA ELEMENTARY SCHOOL

MIDDLE RIVER, MD

Proj #: 15228.D

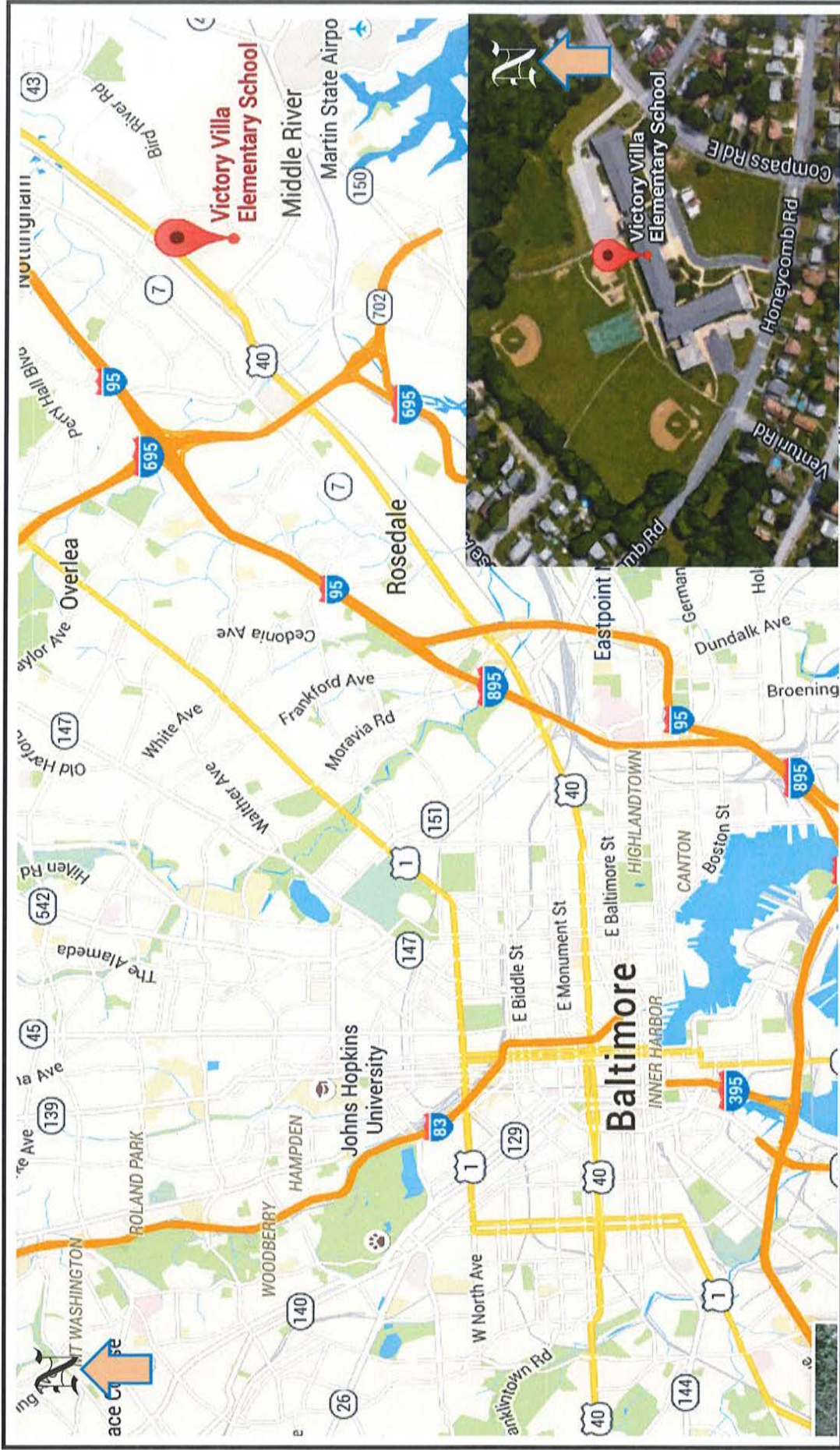
Date: 04-08-2016

Figure: 8.2 Prep. by: AB

Scale: NTS Rev. by: DK

APPENDIX A

Subsurface Investigation Report



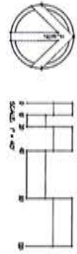
SITE VICINITY MAP

VICTORY VILLA ELEMENTARY SCHOOL
 500 Compass Rd, BALTIMORE, MD

D. W. KOZERA, INC.
 1408 Bare Hills Avenue
 Baltimore, MD 21209

TEL.: 410-823-1060
 FAX: 410-823-1062
 www.dwkozera.com

Figure	1 / 1	DRAWN BY	AB	CHECKED BY:	DK
DATE	Apr-16	DWK NO.	15228.D	SCALE	Not to Scale



BORING LOCATION PLAN

- BUILDING BORINGS (8)
- ⊕ STORMWATER MANAGEMENT BORINGS (4)
- ⊕ INFILTRATION TESTS (3)
- ⊕ PAVEMENT BORINGS (1)

DATA SOURCE

FIELD DATA FROM THE 1998 AND 1999 SOIL BORING LOGS, THE 2000 SOIL BORING LOGS, AND THE 2001 SOIL BORING LOGS. THE DATA WAS OBTAINED FROM THE 1998 AND 1999 SOIL BORING LOGS, THE 2000 SOIL BORING LOGS, AND THE 2001 SOIL BORING LOGS. THE DATA WAS OBTAINED FROM THE 1998 AND 1999 SOIL BORING LOGS, THE 2000 SOIL BORING LOGS, AND THE 2001 SOIL BORING LOGS.

GENERAL NOTES

1. SEE GENERAL NOTES TO THE CONTRACT DOCUMENTS.
2. SEE GENERAL NOTES TO THE CONTRACT DOCUMENTS.
3. PAVEMENT BORING (1) IS LOCATED AT THE INTERSECTION OF MONTCLAIR ROAD AND COMPASS ROAD.
4. SEE GENERAL NOTES TO THE CONTRACT DOCUMENTS.
5. PAVEMENT BORING (1) IS LOCATED AT THE INTERSECTION OF MONTCLAIR ROAD AND COMPASS ROAD.

NO.	DATE	DESCRIPTION
01	03-28-2011	10% SCHEMATIC DESIGN SUBMISSION

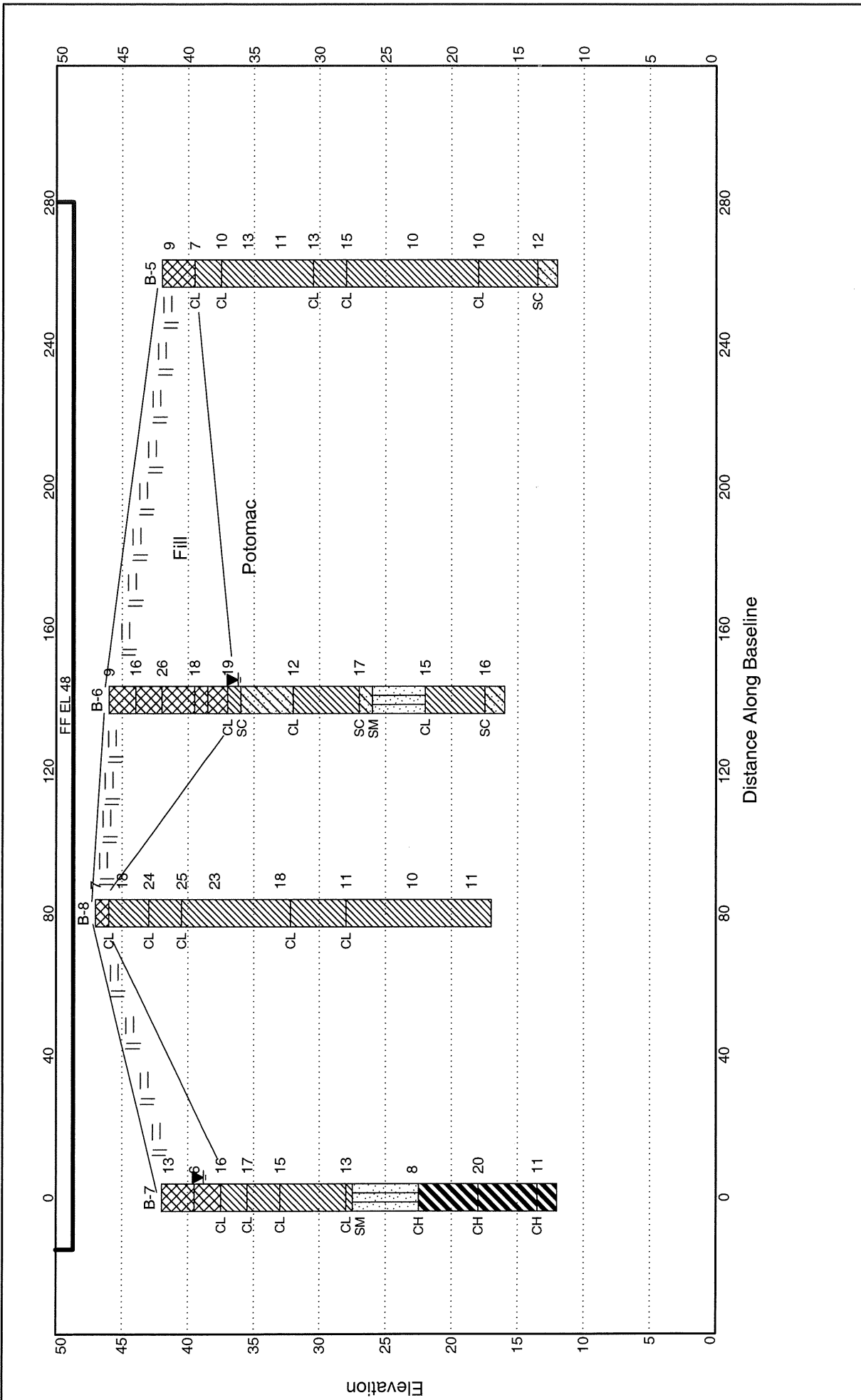
Murphy & Dittenhafer
ARCHITECTS

800 North Charles Street, Baltimore, Maryland 21201
410-528-6800 Voice 410-528-6877 Fax

200 West Market Street, York, Pennsylvania 17401
717-466-8800 Voice 717-466-2000 Fax

**BCPS VICTORY VILLA
ELEMENTARY SCHOOL**
500 COMPASS ROAD BALTIMORE, MD

C1.02
SITE PLAN



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 Baltimore, Maryland
 PROFESSIONAL ENGINEERS & GEOLOGISTS

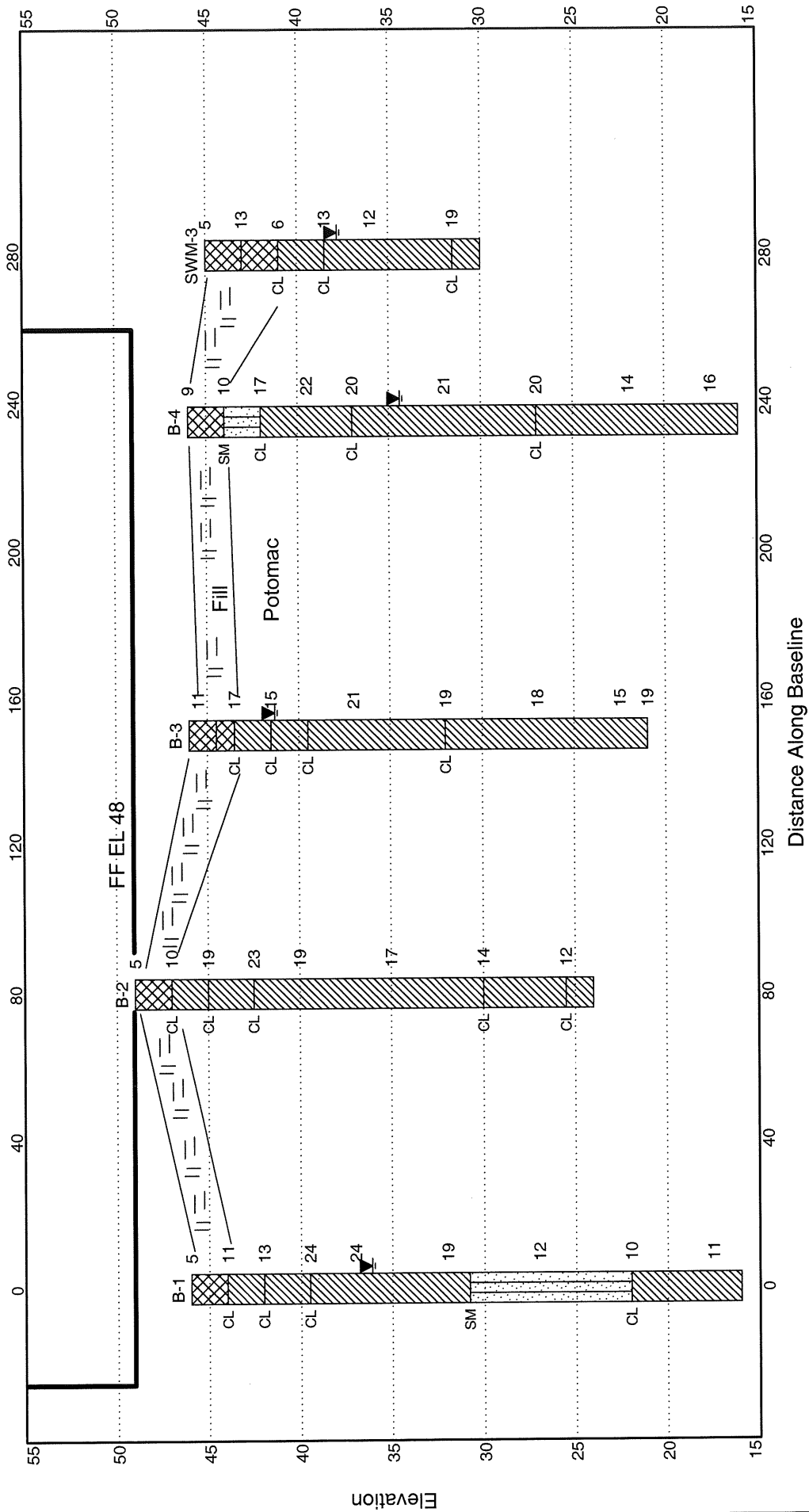
SUBSURFACE PROFILE
 Section A-A'

Victory Villa Elementary School
 500 Compass Road

Contract No.
 15228.D

Date
 Apr 16

Drawing No.
 1



D. W. KOZERA, INC.
 Baltimore, Maryland
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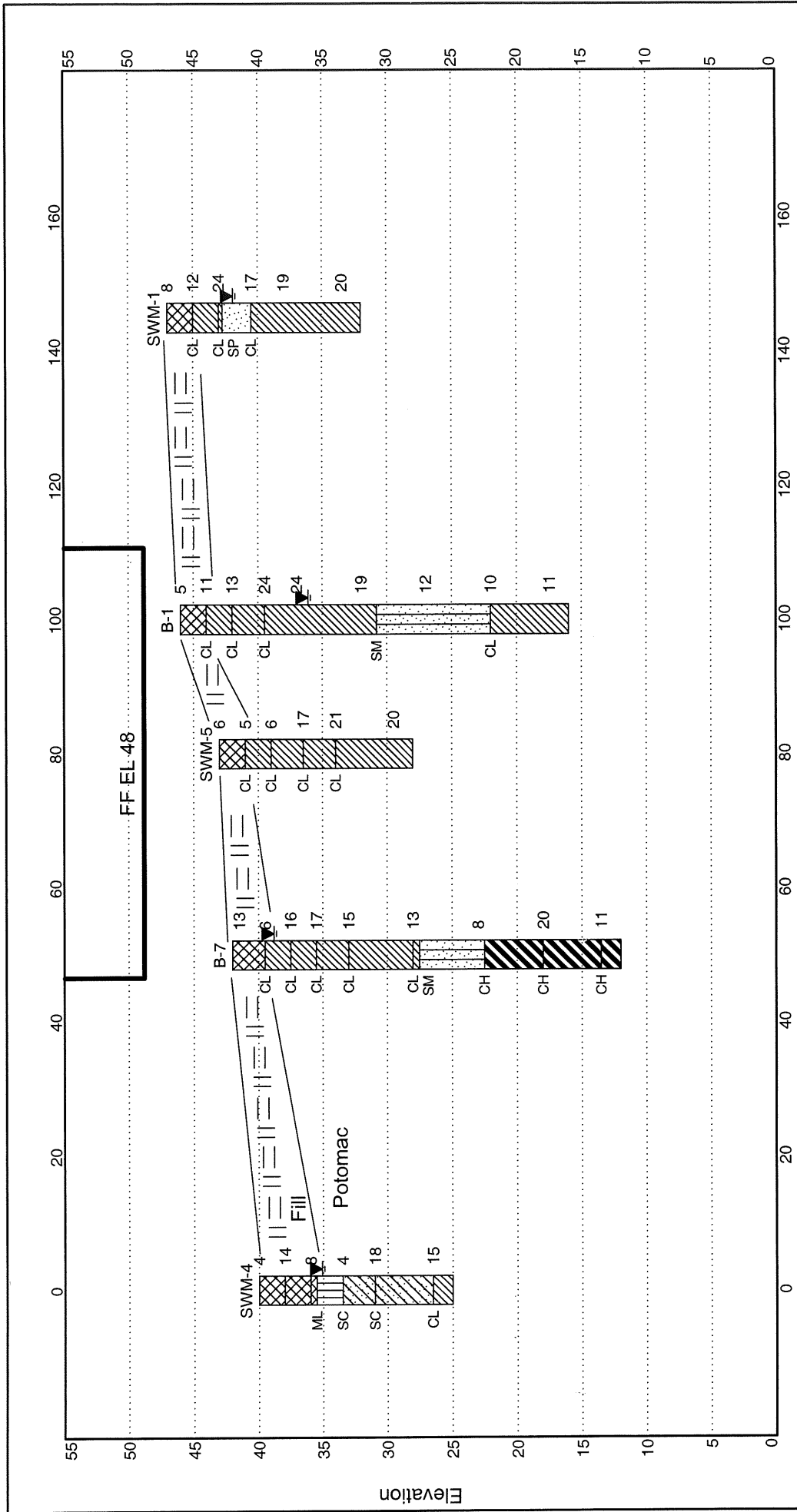
SUBSURFACE PROFILE Section B-B'

Victory Villa Elementary School
 500 Compass Road

Contract No.
 15228.D

Date
 Apr 16

Drawing No.
 1



Distance Along Baseline

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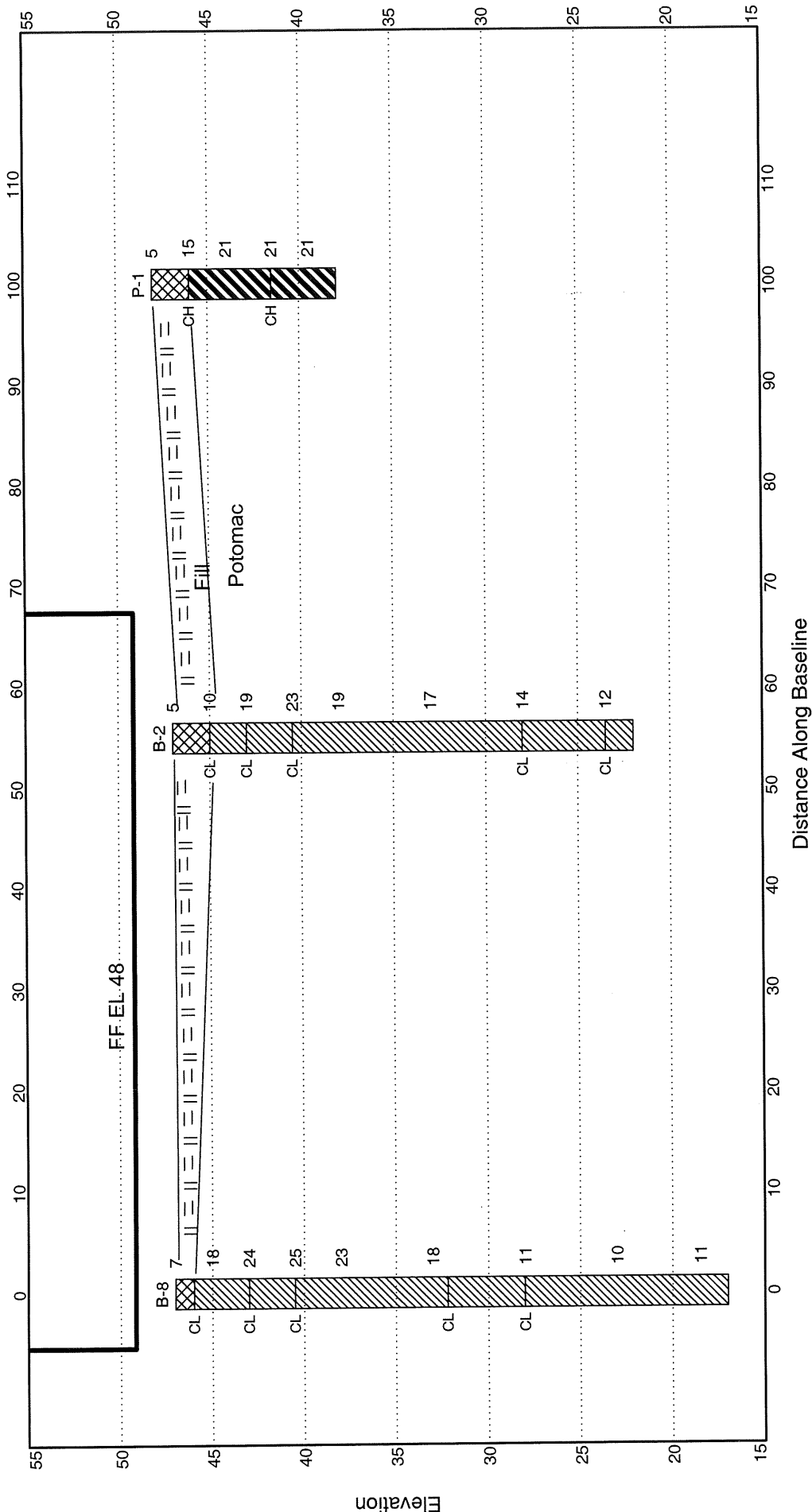
SUBSURFACE PROFILE
 Section C-C'

Victory Villa Elementary School
 500 Compass Road

Contract No.
 15228.D

Date
 Apr 16

Drawing No.
 1



Victory Villa Elementary School
500 Compass Road

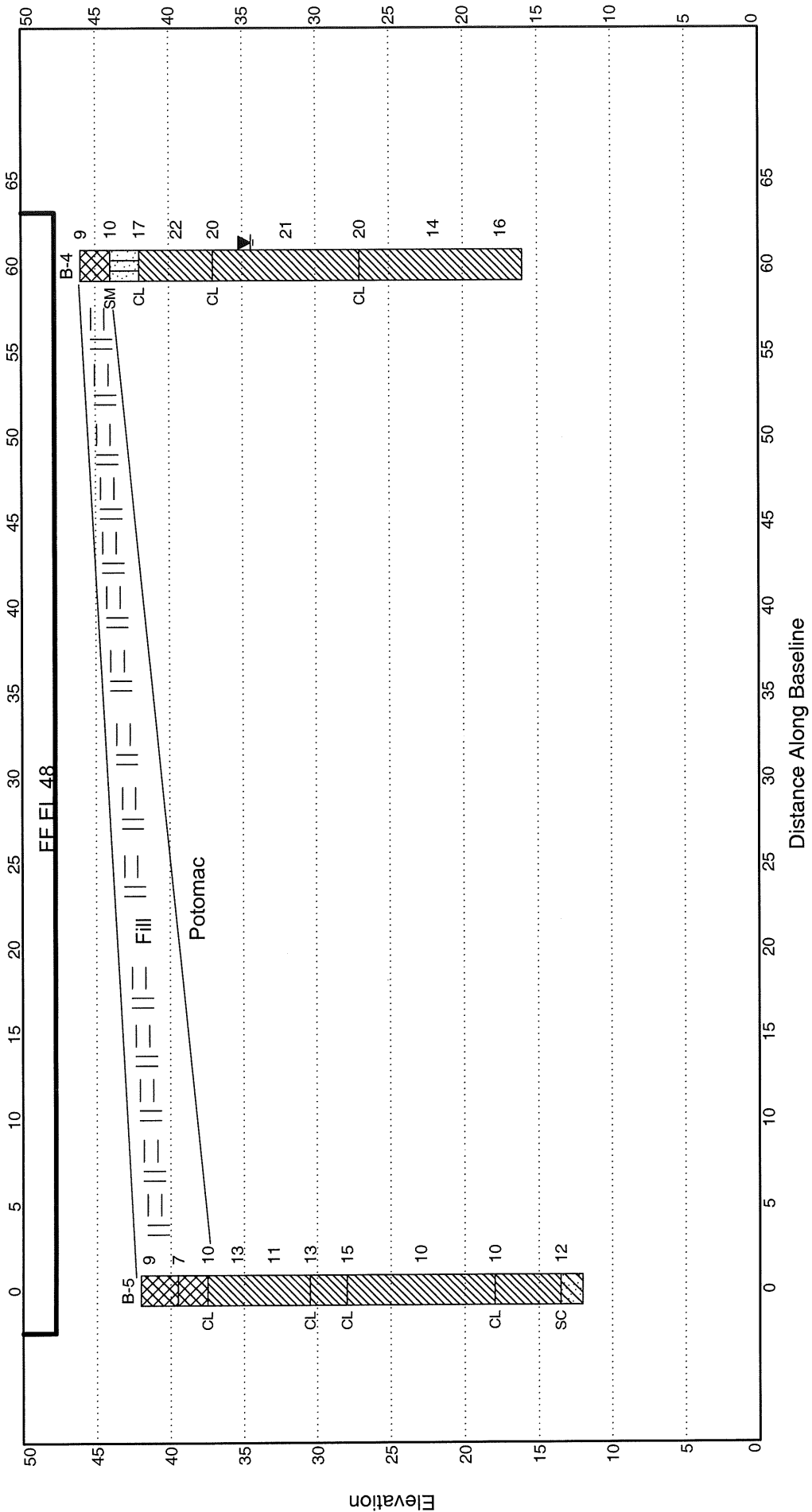
SUBSURFACE PROFILE Section D-D'

D. W. KOZERA, INC.
Baltimore, Maryland
PROFESSIONAL ENGINEERS & GEOLOGISTS

Contract No.
15228.D

Date
Apr 16

Drawing No.
1



Victory Villa Elementary School
500 Compass Road

SUBSURFACE PROFILE Section E-E'

D. W. KOZERA, INC.
Baltimore, Maryland
PROFESSIONAL ENGINEERS & GEOLOGISTS

Contract No. 15228.D	Date Apr 16	Drawing No. 1
-------------------------	----------------	------------------

**Geotechnical Engineering Study, Victory Villa Elementary School Building
500 Compass Rd, Middle River, Maryland
(DWK Contract Number 15228.D)**

GENERAL NOTES FOR TEST BORINGS AND TEST PITS

1. Test Borings

Test borings are advanced by turning an auger with a center opening of 2-1/2 or 3-1/4 inches. Cuttings are brought to the surface by the auger flights. Sampling is performed through the center opening in the hollow stem auger by standard methods. No water was introduced into the borings using this procedure.

1.1. Standard Penetration Tests

Testing is performed by driving a two-inch O.D., 1-3/8 inch I.D. sampling spoon through three, six-inch intervals or as indicated, using a 140-pound hammer falling 30 inches according to ASTM D1586. The number given as the 'N' value is the sum of the blows required to drive the samples for the second and third intervals.

2. Test Pits

Test pits are logged to provide a record for geotechnical evaluation, construction inspection, or other specialized purpose such as building damage investigations, subgrade inspections, etc.

2.1. Test Procedures

PP, when indicated, denotes the results of tests performed with a Pocket Penetrometer. The numbers indicate the unconfined compressive strength of the undisturbed soils in tsf. DCP, when indicated, denotes the results of tests performed with a Dynamic Cone Penetrometer at an initial seating increment of two-inches, and 1-3/4-inch increments thereafter. The penetrometer is driven by a 15-pound hammer falling 20-inches, and the number of hammer blows per increment is recorded.

3. General

The test pits and test boring logs represent subsurface conditions only at the specified location and at the particular time excavated. The passage of time may result in changes in these conditions. Conditions at other locations on the site may differ from conditions occurring at the test pit or test boring location.

The stratification lines represent the approximate boundary line between soil and rock types as observed in the test pit and test boring. The soil profile, foundation dimensions, water level observations, and test results presented on the log have been made with reasonable care and accuracy, but must be considered only an approximate representation of the subsurface conditions to be encountered at that particular location.

The observed water levels are considered a reliable indication of the groundwater table levels at the time indicated. The groundwater table may be completely dependent on the amount of precipitation at the site during a particular period of time. Fluctuations in the water table should be expected with variations in precipitation, surface run-off, evaporation, construction activity, etc.

4. Locations and Grades

The test borings were located in the field by D.W. Kozera, Inc. based on drawings provided to us. The ground surface elevations were estimated from the drawings.



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-1**
Contract No.: 15228.D
Page: 1 of 1

Project: Victory Villa Elementary School
Location: 500 Compass Road
Baltimore, Maryland

Ground Surf. El. (±): 46.0
Date Started : 3-23-16
Date Completed : 3-23-16
Contractor : GeoServices Corp.
Driller : S. Gonzalez
Rig : cme 45, Auto Hammer
Drill Method : 2 1/4" HSA
Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-23	13:05	16.0	None	16.4
Completion	3-23	12:45	---	---	---
Casing Pulled	3-23	12:50	None	28.5	---
	3-24	07:25	9.9	None	11.6

Depth (ft)	Surf. Elev. 46.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0											
45		1	1-2-3	5				Sandy Lean Clay, Lean Clay with Sand, Silty Sand, FILL, gravel, moist, brown	Fill	A	Topsoil = 0.3'
		2	3-4-7	11			CL	LEAN CLAY with sand, trace gravel, moist, brown		B	
5		3	4-6-7	13			CL	SANDY LEAN CLAY, trace sand, moist, brown			
40		4	6-10-14	24				LEAN CLAY, moist, brown			Penetrometer >4.5 tsf
10		5	5-10-14	24	▼		CL				>4.5 tsf
15		6	4-8-11	19	▽						>4.5 tsf
30		7	4-6-6	12			SM	SILTY SAND, wet, light brown wet, light brown @ 19.0'	Potomac		
20		8	4-5-5	10				SANDY LEAN CLAY, wet, gray			4.5 tsf
25		9	3-4-7	11			CL				4.0 tsf
30								Bottom of Test Boring @ 30.0'			

TEST_BORING_LOG_15228.GPJ KOZERA.GDT 4/5/16



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-2**
Contract No.: 15228.D
Page: 1 of 1

Project: Victory Villa Elementary School
Location: 500 Compass Road
Baltimore, Maryland

Ground Surf. El. (±): 47.0
Date Started : 3-21-16
Date Completed : 3-21-16
Contractor : GeoServices Corp.
Driller : S. Gonzalez
Rig : cme 45, Auto Hammer
Drill Method : 2 1/4" HSA
Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-21	12:35	---	---	---
Completion	3-21	12:40	None	23.5	---
Casing Pulled	3-23	07:10	None	None	16.6

Depth (ft)	Surf. Elev. 47.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0		1	1-2-3	5				Sandy Lean Clay, FILL, trace gravel, contains roots, moist, brown	Fill	A	Topsoil = 0.2'
45		2	2-4-6	10			CL	Sandy LEAN CLAY, moist, brown	Potomac	B	Penetrometer 2.8 tsf
5		3	4-8-11	19			CL	LEAN CLAY, trace sand, moist, brown		2.3 tsf	
40		4	5-9-14	23			CL	LEAN CLAY, moist, brown		>4.5 tsf	
10		5	5-8-11	19			CL	LEAN CLAY, moist, brown		>4.5 tsf	
35		6	5-7-10	17			CL	LEAN CLAY, moist, brown		>4.5 tsf	
20		7	5-6-8	14			CL	LEAN CLAY, trace sand, moist, brown		3.0 tsf	
25		8	4-5-7	12			CL	Sandy LEAN CLAY, wet, brown		~4.6 tsf	
25								Bottom of Test Boring @ 25.0'			



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-3**
Contract No.: 15228.D
Page: 1 of 1

Project: **Victory Villa Elementary School**
Location: **500 Compass Road**
Baltimore, Maryland

Ground Surf. El. (±): 46.0
Date Started : 3-21-16
Date Completed : 3-21-16
Contractor : GeoServices Corp.
Driller : S. Gonzalez
Rig : cme 45, Auto Hammer
Drill Method : 2 1/4" HSA
Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-21	11:35	---	---	---
Completion	3-21	11:40	None	23.5	---
Casing Pulled	3-21	11:55	None	None	16.9
	3-23	07:05	4.7	None	7.8

Depth (ft)	Surf. Elev. 46.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0								Poorly Graded Sand, FILL, crushed stone, moist, light brown	Fill	A	Asphalt = 0.3' Penetrometer 3.2 tsf
45		1	5-7-4	11				Lean Clay with sand, FILL, moist, brown			
		2	5-7-10	17			CL	LEAN CLAY with sand, moist, light brown-brown	Potomac	B	>4.5 tsf >4.5 tsf ~4.6 tsf 4.5 tsf 3.8 tsf
5		3	5-6-9	15	▼		CL	Sandy LEAN CLAY, trace gravel, moist, brown			
40								LEAN CLAY, wet, gray			
		5	5-9-12	21			CL	wet, gray-brown @ 9.0'			
35											
15		6	5-8-11	19				LEAN CLAY, trace sand, wet, brown			
30											
20		7	5-8-10	18			CL				
25											
		8	5-6-9	15							
		4	6-8-11	19				Bottom of Test Boring @ 25.0'			



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-4**
Contract No.: **15228.D**
Page: **1 of 1**

Project: **Victory Villa Elementary School**
Location: **500 Compass Road**
Baltimore, Maryland

Ground Surf. El. (±): **46.0**
Date Started : **3-17-16**
Date Completed : **3-17-16**
Contractor : **GeoServices Corp.**
Driller : **S. Gonzalez**
Rig : **cme 45, Auto Hammer**
Drill Method : **2 1/4" HSA**
Inspector : **D. Kozera**

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-17	12:05	---	---	---
Completion	3-17	12:10	None	28.5	---
Casing Pulled	3-17	12:25	None	None	18.9
	3-21	07:15	11.6	None	18.4

Depth (ft)	Surf. Elev. 46.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0											
45		1	WOH-3-6	9				Silty Sand, Lean Clay with Sand, FILL, gravel, moist, dark brown, brown	Fill	A	Topsoil = 0.3'
		2	3-3-7	10			SM	SILTY SAND, moist, red-brown, contains trace roots		B	Penetrometer >4.5 tsf
5		3	5-7-10	17			CL	LEAN CLAY, trace sand, moist, brown			
40		4	5-10-12	22			CL				>4.5 tsf
10		5	5-8-12	20			CL	LEAN CLAY, moist, dark brown			>4.5 tsf
35											
15		6	4-8-13	21			CL				>4.5 tsf
30											
20		7	4-8-12	20			CL	LEAN CLAY, trace sand, wet, dark brown, contains trace lignite			>4.5 tsf
25											
25		8	2-5-9	14			CL				>4.5 tsf
20											
25		9	4-6-10	16							>4.5 tsf
30								Bottom of Test Boring @ 30.0'			

TEST_BORING_LOG_15228.GPJ_KOZERA.GDT_4/5/16



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-5**
Contract No.: 15228.D
Page: 1 of 1

Project: **Victory Villa Elementary School**
Location: **500 Compass Road**
Baltimore, Maryland

Ground Surf. El. (±): 42.0
Date Started : 3-24-16
Date Completed : 3-24-16
Contractor : GeoServices Corp.
Driller : S. Gonzalez
Rig : cme 45, Auto Hammer
Drill Method : 2 1/4" HSA
Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-24	08:40	---	---	---
Completion	3-24	08:45	None	28.5	---
Casing Pulled	3-24	09:00	None	None	23.5
	3-26	13:00	3.0	None	6.5

Depth (ft)	Surf. Elev. 42.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks	
0								Sandy Lean Clay, FILL, cinder, moist, brown	Fill	A	Asphalt = 0.4' Crushed Stone Base = 0.8'	
40		1	5-4-5	9				Sandy Lean Clay, FILL, cinder, moist, brown				Penetrometer 3.2 tsf
5		2	3-3-4	7				LEAN CLAY, trace sand, moist, gray-brown	Potomac	B	3.4 tsf	
35		3	4-4-6	10				moist brown, light brown @ 6.5'				~4.5 tsf
10		4	5-6-7	13			CL	moist, black, gray, brown @ 9.0' contains organic silt layer at bottom of sample				1.9 tsf
30		5	4-5-6	11				LEAN CLAY, with sand, moist, gray, contains lignite lenses				3.3 tsf
15		6	4-6-7	13			CL	LEAN CLAY, moist, gray				3.8 tsf
25		7	4-7-8	15								3.3 tsf
20		8	3-4-6	10			CL					
20		9	3-5-5	10			CL	Sandy LEAN CLAY, moist, gray, contains lignite				2.1 tsf
15		10	4-6-6	12			SC	CLAYEY SAND, wet, gray, contains lignite			.75 tsf	
30								Bottom of Test Boring @ 30.0'				

TEST_BORING_LOG_15228.GPJ_KOZERA.GDT_4/7/16



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-6**
Contract No.: 15228.D
Page: 1 of 1

Project: Victory Villa Elementary School
Location: 500 Compass Road
Baltimore, Maryland

Ground Surf. El. (±): 46.0
Date Started : 3-23-16
Date Completed : 3-23-16
Contractor : GeoServices Corp.
Driller : S. Gonzalez
Rig : cme 45, Auto Hammer
Drill Method : 2 1/4" HSA
Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-23	08:25	---	---	---
Completion	3-23	08:30	None	28.5	---
Casing Pulled	3-23	08:45	19.4	None	19.9
	3-24	07:15	9.8	None	14.6

Depth (ft)	Surf. Elev. 46.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0								Lean Clay with Sand, FILL, moist, brown, contains roots	Fill	A	Topsoil = 0.2'
45		1	1-4-5	9				Sandy Lean Clay, FILL, trace gravel, moist, brown			Penetrometer 3.7 tsf
		2	5-8-8	16				Lean Clay with Sand, FILL, moist, brown, contains vertical sandy lean clay seam			1.5 tsf
5		3	5-13-13	26				Silty Sand, FILL, wet, brown			1.5 tsf
40		4	7-9-9	18				Sandy Lean Clay with gravel, FILL, moist, brown			
		5	6-8-11	19	▼		CL	LEAN CLAY, trace sand, moist, red-brown	Potomac	B	>4.5 tsf
10							SC	CLAYEY SAND, wet, light brown, brown			>4.5 tsf
35								Sandy LEAN CLAY, wet, light brown			4.3 tsf
15		6	4-5-7	12			CL				
30							SC	CLAYEY SAND, wet, light brown			
20		7	4-8-9	17			SM	SILTY SAND, wet, light brown			
25								Sandy LEAN CLAY, wet, gray, contains clayey sand lenses and layers			>4.5 tsf
25		8	5-8-7	15			CL				
20							SC	CLAYEY SAND, wet, brown, contains silty sand layer			
30		9	2-6-10	16				Bottom of Test Boring @ 30.0'			

TEST_BORING_LOG_15228.GPJ_KOZERA.GDT_4/5/16



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-7**
Contract No.: **15228.D**
Page: **1 of 1**

Project: **Victory Villa Elementary School**
Location: **500 Compass Road**
Baltimore, Maryland

Ground Surf. El. (±): **42.0**
Date Started : **3-21-16**
Date Completed : **3-21-16**
Contractor : **GeoServices Corp.**
Driller : **S. Gonzalez**
Rig : **cme 45, Auto Hammer**
Drill Method : **2 1/4" HSA**
Inspector : **D. Kozera**

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-21	08:30	13.6	19.0	---
Completion	3-21	08:45	26.9	28.5	---
Casing Pulled	3-21	09:00	10.1	None	16.9
	3-23	07:15	3.2	None	6.5

Depth (ft)	Surf. Elev. 42.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0								Silty Sand, FILL, crushed stone, cinder, gravel, moist, gray-brown	Fill	A	Asphalt = 0.3' Very poor recovery @ 0.5'
40		1	3-5-8	13				lean clay, FILL, with sand, moist, brown, contains trace roots		B	Penetrometer 0.55 tsf >4.5 tsf
5		2	3-3-3	6	▽			Sandy LEAN CLAY, moist, brown, contains trace roots	Potomac		>4.5 tsf
35		3	3-7-9	16			CL	LEAN CLAY, trace sand, moist, red-brown, contains sandy clay lenses			>4.5 tsf
10		4	5-7-10	17			CL	LEAN CLAY with sand, moist, red-brown, contains sandy silt layer			>4.5 tsf
30		5	4-7-8	15			CL	LEAN CLAY, trace sand, moist, gray, contains lignite layer			3.25 tsf
15		6	4-7-6	13	▽		SM	SILTY SAND, moist, gray			1.4 tsf
25		7	5-3-5	8			CH	contains lignite, wet, gray @ 19.0' FAT CLAY, moist, gray			3.3 tsf
20		8	4-9-11	20			CH	FAT CLAY, trace sand, moist, gray			1.7 tsf
25		9	3-4-7	11			CH	FAT CLAY, moist, gray-brown			
30								Bottom of Test Boring @ 30.0'			

TEST_BORING_LOG_15228.GPJ_KOZERA.GDT_4/5/16



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **B-8**
Contract No.: 15228.D
Page: 1 of 1

Project: Victory Villa Elementary School
Location: 500 Compass Road
Baltimore, Maryland

Ground Surf. El. (±): 47.0
Date Started : 3-23-16
Date Completed : 3-23-16
Contractor : GeoServices Corp.
Driller : S. Gonzalez
Rig : cme 45, Auto Hammer
Drill Method : 2 1/4" HSA
Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-23	10:00	---	---	---
Completion	3-23	10:05	None	28.5	---
Casing Pulled	3-23	10:20	None	None	18.9
	3-24	07:20	None	None	18.7

Depth (ft)	Surf. Elev. 47.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0		1	3-3-4	7				Sandy Lean Clay, FILL, moist, brown, contains roots	Fill	A	Topsoil = 0.4'
45		2	4-8-10	18			CL	LEAN CLAY, with sand, moist, brown		B	Penetrometer 3.6 tsf
5		3	5-11-13	24			CL	LEAN CLAY, moist, brown			2.85 tsf
40		4	5-10-15	25				LEAN CLAY, trace sand, moist, brown			>4.5 tsf
10		5	6-10-13	23			CL				>4.5 tsf
35											>4.5 tsf
15		6	5-8-10	18			CL	LEAN CLAY, with sand, moist, brown, gray, contains silty sand with cemented sand layer	Potomac		1.85 tsf
30											>4.5 tsf
20		7	3-4-7	11				SANDY LEAN CLAY, moist, brown			3.9 tsf
25											>4.5 tsf
25		8	3-4-6	10			CL	moist, gray @ 24.0'			4.2 tsf
20											>4.5 tsf
30		9	3-4-7	11							4.3 tsf
								Bottom of Test Boring @ 30.0'			



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **SWM-1**

Contract No.: 15228.D

Page: 1 of 1

Project: **Victory Villa Elementary School**

Location: **500 Compass Road**

Baltimore, Maryland

Ground Surf. El. (±): 47.0

Date Started : 3-24-16

Date Completed : 3-24-16

Contractor : GeoServices Corp.

Driller : S. Gonzalez

Rig : cme 45, Auto Hammer

Drill Method : 2 1/4" HSA

Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-24	09:50	---	---	---
Completion	3-24	09:55	None	13.5	---
Casing Pulled	3-24	10:05	5.1	None	5.4
	3-26	12:45	2.6	None	5.0

Depth (ft)	Surf. Elev. 47.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0		1	1-3-5	8				Clayey Sand, FILL, trace gravel, moist, brown	Fill	A	Topsoil = 0.2'
45		2	3-5-7	12			CL	LEAN CLAY, with sand, moist, brown	Potomac	B	Penetrometer >4.5 tsf
5		3	6-11-13	24			SP	Sandy LEAN CLAY, moist, brown POORLY GRADED SAND with silt, wet, brown		1.6 tsf	
40		4	4-7-10	17			CL	LEAN CLAY, trace sand, wet, light brown, brown		>4.5 tsf	
10		5	5-8-11	19			CL	wet, red-brown @ 9.0'		>4.5 tsf	
35		6	4-8-12	20			CL	wet, brown @ 13.5'		3.9 tsf	
15								Bottom of Test Boring @ 13.5'			



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **SWM-3**

Contract No.: **15228.D**

Page: **1 of 1**

Project: **Victory Villa Elementary School**

Location: **500 Compass Road**

Baltimore, Maryland

Ground Surf. El. (±): **45.0**

Date Started : **3-17-16**

Date Completed : **3-21-16**

Contractor : **GeoServices Corp.**

Driller : **S. Gonzalez**

Rig : **cme 45, Auto Hammer**

Drill Method : **2 1/4" HSA**

Inspector : **D. Kozera**

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-17	10:50	---	---	---
Completion	3-17	10:55	None	13.5	---
Casing Pulled	3-17	11:00	None	None	9.5
	3-21	07:25	7.2	None	7.7

Depth (ft)	Surf. Elev. 45.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0 - 45											
		1	1-2-3	5				Lean Clay with Sand, FILL, roots, moist, brown	Fill	A	Topsoil = 0.3'
		2	5-6-7	13				Sandy Lean Clay, Silty Sand with Gravel, FILL, coal, moist, brown			2.7 tsf
5 - 40		3	2-3-3	6			CL	LEAN CLAY with sand, contains roots, moist, brown	Potomac	B	>4.5 tsf
		4	1-5-8	13				LEAN CLAY, trace sand, wet, brown			>4.5 tsf
10 - 35		5	1-4-8	12			CL				>4.5 tsf
		6	4-8-11	19			CL	LEAN CLAY, wet, brown			>4.5 tsf
15 - 30								Bottom of Test Boring @ 15.0'			



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **SWM-4**

Contract No.: **15228.D**

Page: **1 of 1**

Project: **Victory Villa Elementary School**

Location: **500 Compass Road**

Baltimore, Maryland

Ground Surf. El. (±): **40.0**

Date Started : **3-17-16**

Date Completed : **3-21-16**

Contractor : **GeoServices Corp.**

Driller : **S. Gonzalez**

Rig : **cme 45, Auto Hammer**

Drill Method : **2 1/4" HSA**

Inspector : **D. Kozera**

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-17	08:55	---	---	---
Completion	3-17	09:00	None	13.5	---
Casing Pulled	3-17	09:05	None	None	9.7
	3-21	07:30	4.9	None	6.4

Depth (ft)	Surf. Elev. 40.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0 - 40											
		1	WOH-2-2	4				Sandy Lean Clay, FILL, trace gravel, moist, brown	Fill	A	Topsoil = 0.2'
		2	2-5-9	14			Sandy Lean Clay, FILL, trace gravel, tile and brick, moist, brown	Pentrometer: 1.4 tsf			
5 - 35		3	3-3-5	8			ML	Sandy Lean Clay, FILL, trace gravel, moist, brown SILT with sand, moist, dark, brown, contains roots	Potomac	B	2.85 tsf
		4	1-2-2	4			SC	CLAYEY SAND, wet, brown			2.2 tsf
10 - 30		5	5-7-11	18			SC	CLAYEY SAND with gravel, wet, gray-brown			
15 - 25		6	6-8-7	15			CL	Sandy LEAN CLAY, wet, gray, contains lignite			2.6 tsf
								Bottom of Test Boring @ 15.0'			



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: **SWM-5**

Contract No.: **15228.D**

Page: **1 of 1**

Project: **Victory Villa Elementary School**

Location: **500 Compass Road**

Baltimore, Maryland

Ground Surf. El. (±): **43.0**

Date Started : **3-17-16**

Date Completed : **3-21-16**

Contractor : **GeoServices Corp.**

Driller : **S. Gonzalez**

Rig : **cme 45, Auto Hammer**

Drill Method : **2 1/4" HSA**

Inspector : **D. Kozera**

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-17	09:40	---	---	---
Completion	3-17	09:45	None	None	8.9
Casing Pulled	3-21	07:20	None	None	8.7

Depth (ft)	Surf. Elev. 43.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0		1	WOH-2-4	6				Sandy Lean Clay, FILL, trace gravel, roots, moist, brown	Fill	A	Topsoil = 0.4' Pentrometer: 2.8 tsf
40		2	3-2-3	5			CL	LEAN CLAY, with sand, trace gravel, contains trace roots, moist, brown	Potomac	B	1.5 tsf
5		3	3-2-4	6			CL	Sandy LEAN CLAY, trace gravel, moist, brown			
35		4	3-7-10	17			CL	LEAN CLAY, trace sand, moist, brown			>4.5 tsf
10		5	4-8-13	21			CL	LEAN CLAY, wet, red-brown			>4.5 tsf
30		6	4-8-12	20			CL				>4.5 tsf
15								Bottom of Test Boring @ 15.0'			



D. W. KOZERA, INC.
Baltimore, Maryland

PROFESSIONAL ENGINEERS & GEOLOGISTS

TEST BORING LOG

Boring No.: P-1
Contract No.: 15228.D
Page: 1 of 1

Project: Victory Villa Elementary School
Location: 500 Compass Road
Baltimore, Maryland

Ground Surf. El. (±): 48.0
Date Started : 3-23-16
Date Completed : 3-23-16
Contractor : GeoServices Corp.
Driller : S. Gonzalez
Rig : cme 45, Auto Hammer
Drill Method : 2 1/4" HSA
Inspector : D. Kozera

GROUNDWATER OBSERVATIONS

	Date	Time	Depth	Casing	Caved
Encountered	3-23	11:20	---	---	---
Completion	3-23	11:25	None	8.5	---
Casing Pulled	3-23	11:30	None	None	6.4
	3-24	07:20	None	None	6.1

Depth (ft)	Surf. Elev. 48.0	Samples	Blow Counts	"N" Value	Water Level	Graphic	USCS	Description	Formation	Stratum	Remarks
0		1	1-2-3	5				Lean Clay with Sand, FILL, trace gravel, moist, brown	Fill	A	Topsoil = 0.3'
45		2	3-6-9	15				FAT CLAY, trace sand, moist, red, brown	Potomac	B	Pentrometer: 1.6 tsf
5		3	4-9-12	21			CH				>4.5 tsf
40		4	3-9-12	21			CH	FAT CLAY, moist, brown			>4.5 tsf
10		5	4-9-12	21							>4.5 tsf
								Bottom of Test Bottom @ 10.0'			

IN SITU INFILTRATION TEST

CONTRACT NO: 15228.D	DATE: 3/22/16
TEST BORING NO: SWM-3	TEST DEVICE: 4" dia PVC Pipe
PROJECT: BCPS Victory Villa	PIPE LENGTH: 5.83 ft.
LOCATION: Baltimore, Maryland	TEST DEPTH: 5 ft.
SURFACE ELEVATION: EL+45	EXCAVATION EQUIPMENT: HSA
DWK REPRESENTATIVE: N. Morrissey	VISUAL SOIL CLASS: Lean clay with sand, moist, brown

TEST DATA

Date of presoak: 3/21/16
Depth of presoak water after 24 hours: 1.98 ft.

Time	Interval (min)	Depth to top of water (ft.) *	Infiltration rate (ft/hr)**	Infiltration Rate (in/hr)
9:50		3.85		
10:50	60	3.85	0	0
11:50	60	3.85	0	0
12:50	60	3.85	0	0
1:50	60	3.85	0	0

* Measured from top of pipe
** Drop in water level (ft)
Interval (hr)

IN SITU INFILTRATION TEST

CONTRACT NO: 15228.D	DATE: 3/22/16
TEST BORING NO: SWM-4	TEST DEVICE: 4" dia PVC Pipe
PROJECT: BCPS Victory Villa	PIPE LENGTH: 6.98 ft.
LOCATION: Baltimore, Maryland	TEST DEPTH: 5 ft.
SURFACE ELEVATION: EL+40	EXCAVATION EQUIPMENT: HSA
DWK REPRESENTATIVE: N. Morrissey	VISUAL SOIL CLASS: Sandy lean clay w/ gravel, brick, tile, moist, brown

TEST DATA

Date of presoak: 3/21/16
 Depth of presoak water after 24 hours: 2.13 ft.

Time	Interval (min)	Depth to top of water (ft.) *	Infiltration rate (ft/hr)**	Infiltration Rate (in/hr)
9:45		4.85		
10:45	60	4.85	0	0
11:45	60	4.85	0	0
12:45	60	4.85	0	0
1:45	60	4.85	0	0

* Measured from top of pipe
 ** Drop in water level (ft)
 Interval (hr)

IN SITU INFILTRATION TEST

CONTRACT NO: 15228.D	DATE: 3/22/16
TEST BORING NO: SWM-5	TEST DEVICE: 4" dia PVC Pipe
PROJECT: BCPS Victory Villa	PIPE LENGTH: 5.95 ft.
LOCATION: Baltimore, Maryland	TEST DEPTH: 5 ft.
	EXCAVATION EQUIPMENT: HSA
SURFACE ELEVATION: +43.0' EL	VISUAL SOIL CLASS: Sandy clay with
DWK REPRESENTATIVE: N. Morrissey	some gravel, moist, brown

TEST DATA

Date of presoak: 3/21/16
 Depth of presoak water after 24 hours: 2.0 ft.

Time	Interval (min)	Depth to top of water (ft.) *	Infiltration rate (ft/hr)**	Infiltration Rate (in/hr)
9:48		3.95		
10:48	60	3.95	0	0
11:48	60	3.95	0	0
12:48	60	3.95	0	0
1:48	60	3.95	0	0

* Measured from top of pipe
 ** $\frac{\text{Drop in water level (ft)}}{\text{Interval (hr)}}$

APPENDIX B

Soil Laboratory Test Results

SUMMARY OF LABORATORY TESTING
VICTORY VILLA ELEMENTARY SCHOOL

PROJECT #: 15228.D	SAMPLED: -	JAY KAY TESTING, INC.
SAMPLES: 9	LOCATION: <i>Baltimore, Maryland</i>	5233 Lehman Road, Suite 110
REPORT: 04/04/16	REMARKS: -	Spring Grove, PA 17362 Phone: (410) 259-5101

BORING	SAMPLE	DEPTH	MC %	OM %	LL	PL	PI	% FINES	USCS
B-1	Jar	2.0-4.0	18.5	-	42	24	18	82.4	CL
B-1	Jar	4.0-5.5	14.8	-	35	19	16	53.4	CL
B-3	Jar	2.5-4.0	21.0	-	42	25	17	88.1	CL
B-3	Jar	4.5-6.0	15.8	-	30	20	10	57.6	CL
B-5	Jar	2.5-4.0	23.7	-	30	19	11	84.9	CL
SWM-3	Jar	4.0-5.5	20.5	-	-	-	-	-	-
SWM-4	Jar	4.0-5.5	13.9	-	-	-	-	-	-
SWM-5	Jar	4.0-5.5	20.4	-	-	-	-	-	-
P-1	Bulk	0-5.0	21.8	15.4	62	30	32	97.7	CH

Jay Kay Testing, Inc. (AASHTO-Accredited)

VICTORY VILLA ELEMENTARY SCHOOL

Boring: P-1
 Sample: Bulk
 Depth: 0-5.0'

Project No.: 15228.D
 Sampled: -
 Location: Baltimore, Maryland

JAY KAY TESTING, INC.
 5233 Lehman Road, Suite 110
 Spring Grove, PA 17362
 Phone: (410) 259-5101

MODIFIED PROCTOR TEST RESULTS

TEST METHOD: ASTM D-1557 (A)

MAXIMUM DRY UNIT WEIGHT

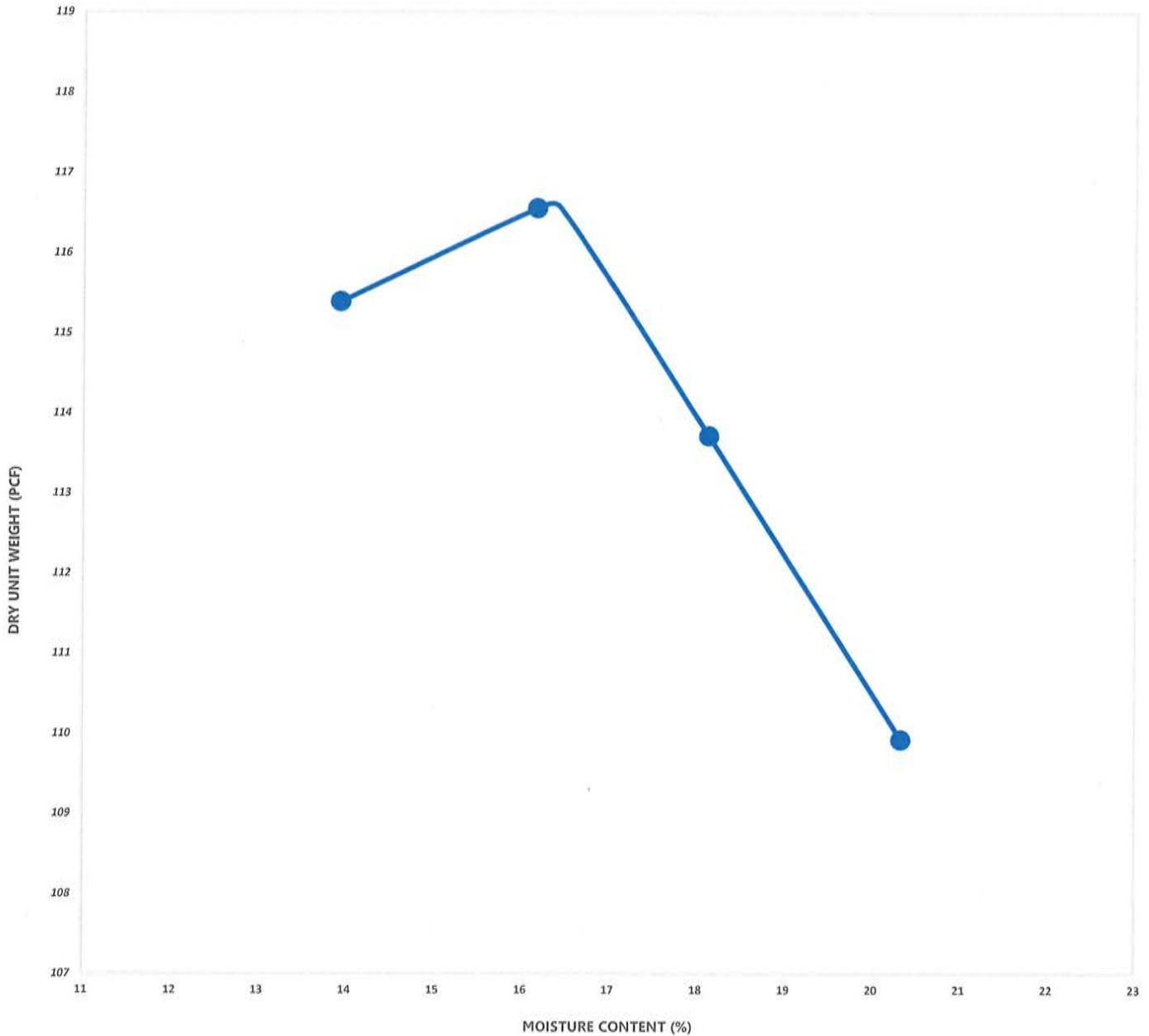
116.6

PCF

OPTIMUM MOISTURE CONTENT

16.4

%



MC	LL	PL	PI	USCS	AASHTO	FINES	VISUAL SOIL DESCRIPTION
21.8	-	-	-	-	-	97.7	Red brown fat clay

VICTORY VILLA ELEMENTARY SCHOOL

Boring: P-1
 Sample: Bulk
 Depth: 0-5.0'

Project No.: 15228.D
 Sampled: -
 Location: Baltimore, Maryland

JAY KAY TESTING, INC.
 5233 Lehman Road, Suite 110
 Spring Grove, PA 17362
 Phone: (410) 259-5101

CALIFORNIA BEARING RATIO TEST RESULTS

CBR AT 0.1"

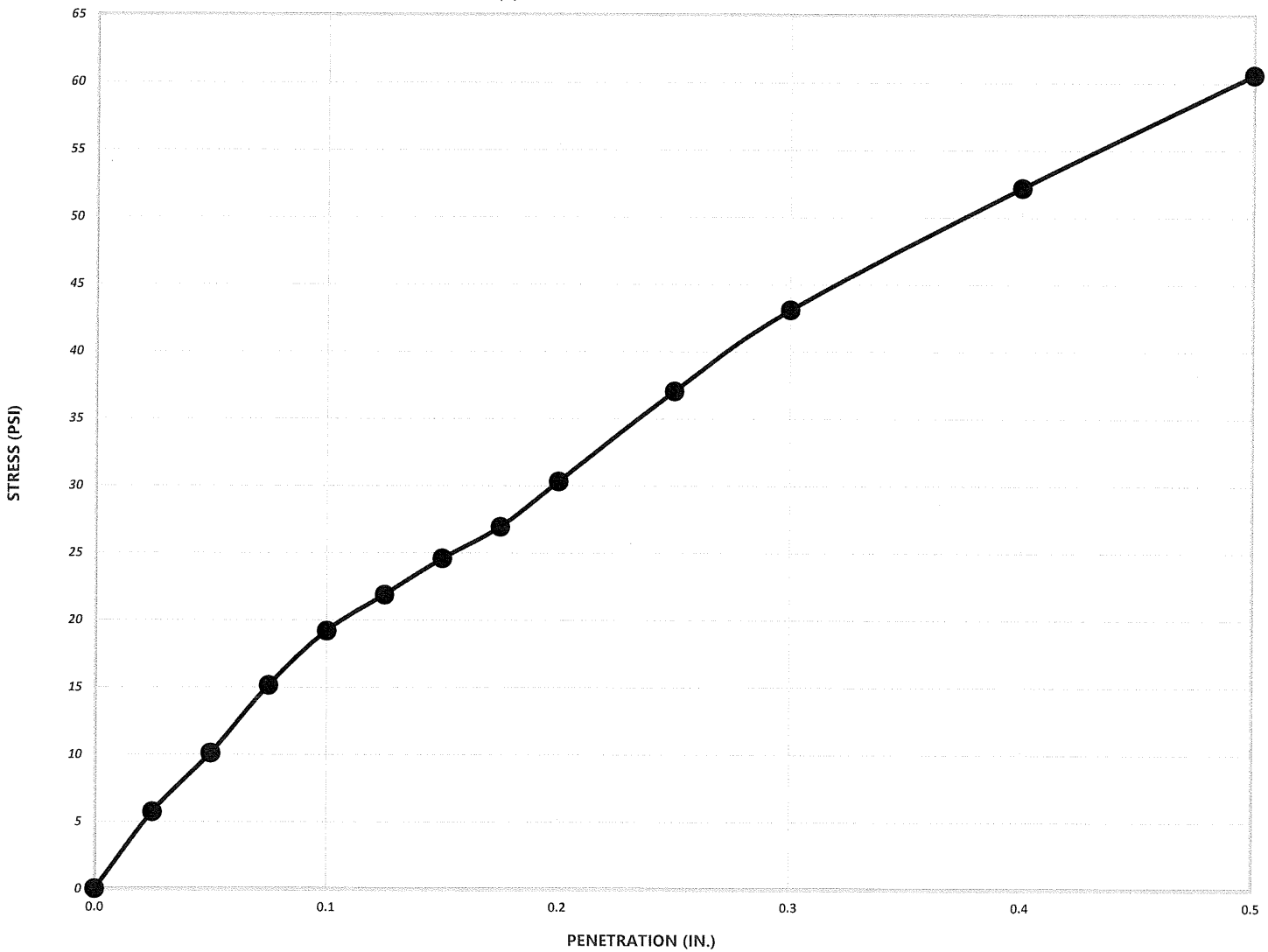
CBR AT 0.2"

1.9

2.0

	Dry Unit Weight	Moisture Content	Compaction	Swell	Surcharge
As Molded	112.6	16.5	96.6	-	100
After Soak	-	-	-	10.76	100
	PCF	%	%	%	PSF

METHOD: ASTM D-1883, COMPACTION: ASTM D-1557 (A)



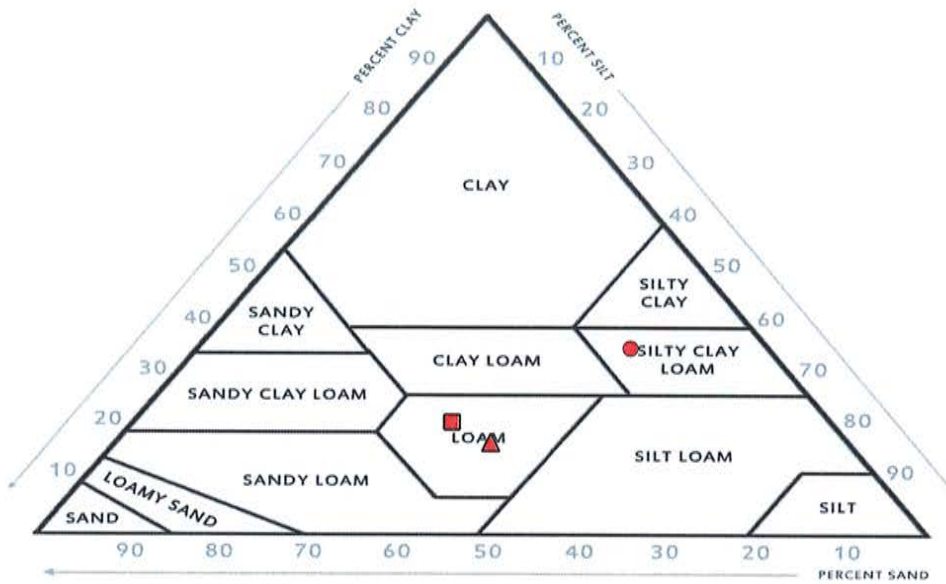
MC	LL	PL	PI	USCS	AASHTO	FINES	VISUAL SOIL DESCRIPTION
21.8	-	-	-	-	-	97.7	Red brown fat clay

SUMMARY OF USDA LABORATORY RESULTS
VICTORY VILLA ELEMENTARY SCHOOL

PROJECT #: 15228.D

SAMPLED: -
 LOCATION: *Baltimore, Maryland*
 REMARKS: -

JAY KAY TESTING, INC.
 5233 Lehman Road, Suite 110
 Spring Grove, PA 17362
 Phone: (410) 259-5101



█	BORING	SAMPLE	DEPTH	% SAND	% SILT	% CLAY	USDA CLASSIFICATION
●	SWM-3	Jar	4.0-5.5	15.4	48.6	36.0	SILTY CLAY LOAM
■	SWM-4	Jar	4.0-5.5	42.4	36.0	21.6	LOAM
▲	SWM-5	Jar	4.0-5.5	40.0	42.3	17.7	LOAM

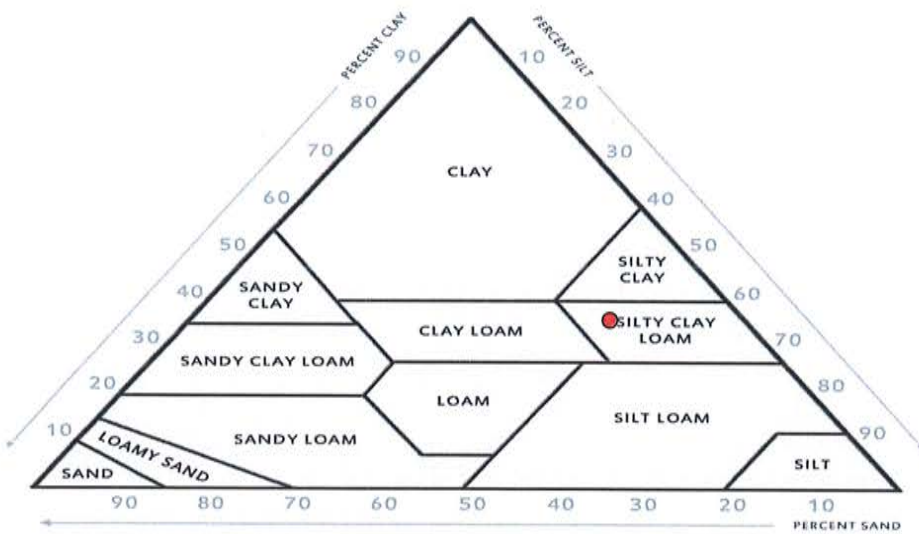
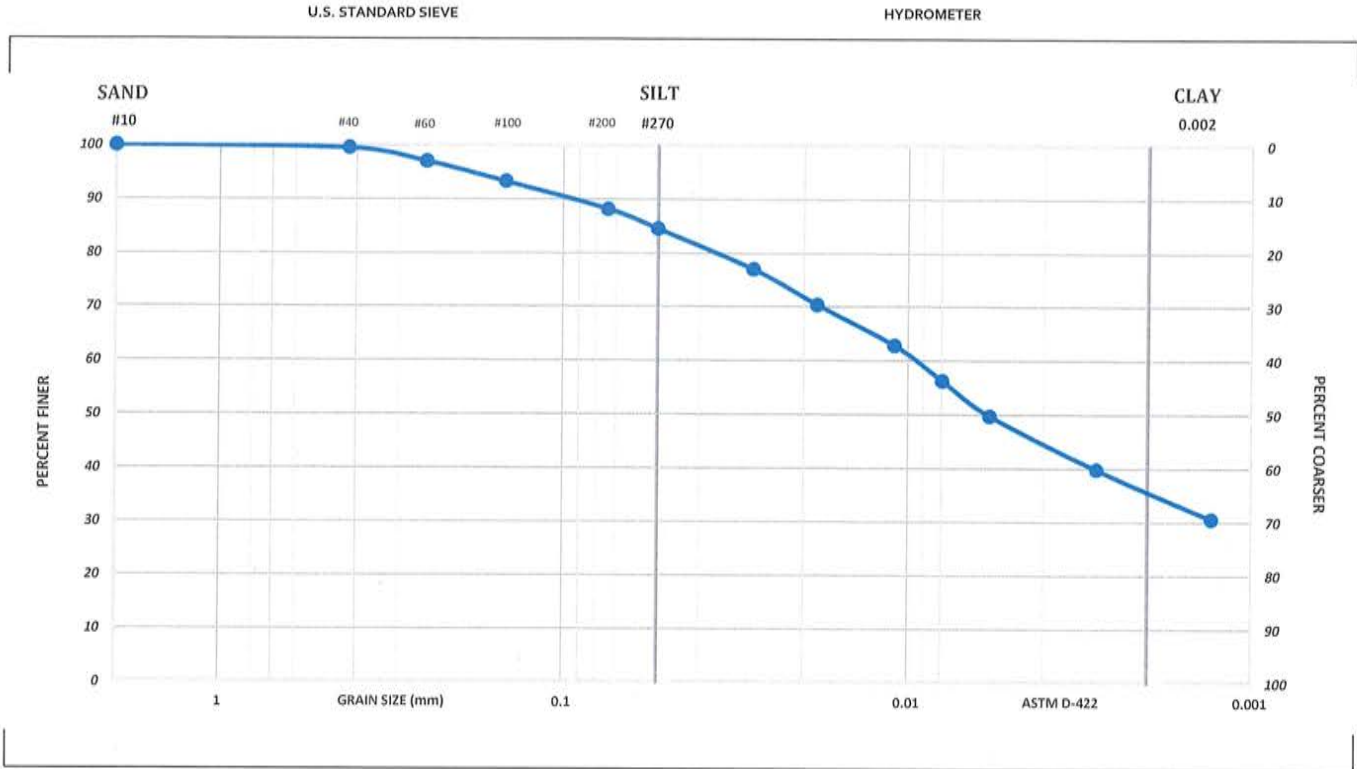
VICTORY VILLA ELEMENTARY SCHOOL

Boring: SWM-3
 Sample: Jar
 Depth: 4.0-5.5'

Project No.: 15228.D
 Sampled: -
 Location: Baltimore, Maryland

JAY KAY TESTING, INC.
 5233 Lehman Road, Suite 110
 Spring Grove, PA 17362
 Phone: (410) 259-5101

USDA RESULTS



PERCENT SAND
15.4 %

PERCENT SILT
48.6 %

PERCENT CLAY
36.0 %

USDA CLASSIFICATION
SILTY CLAY LOAM

MC	LL	PL	PI	USCS	AASHTO
20.5	-	-	-	-	-

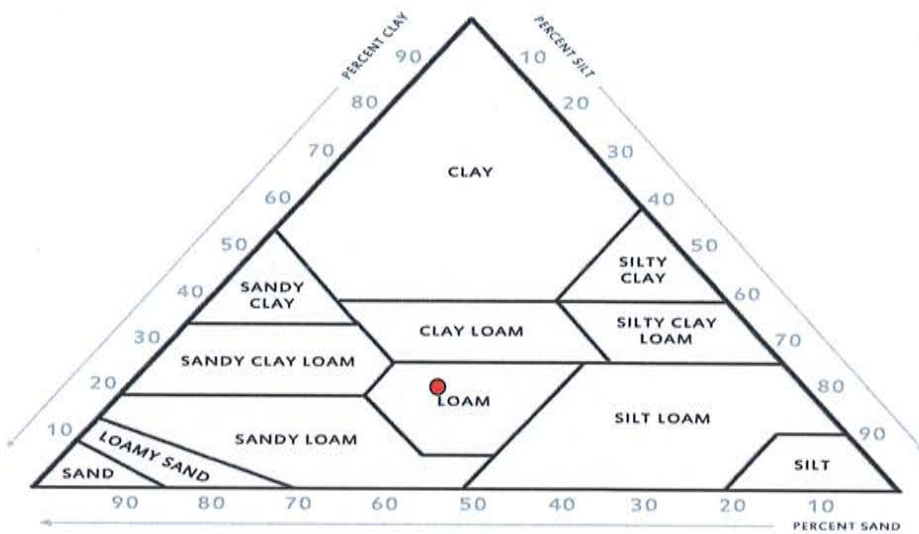
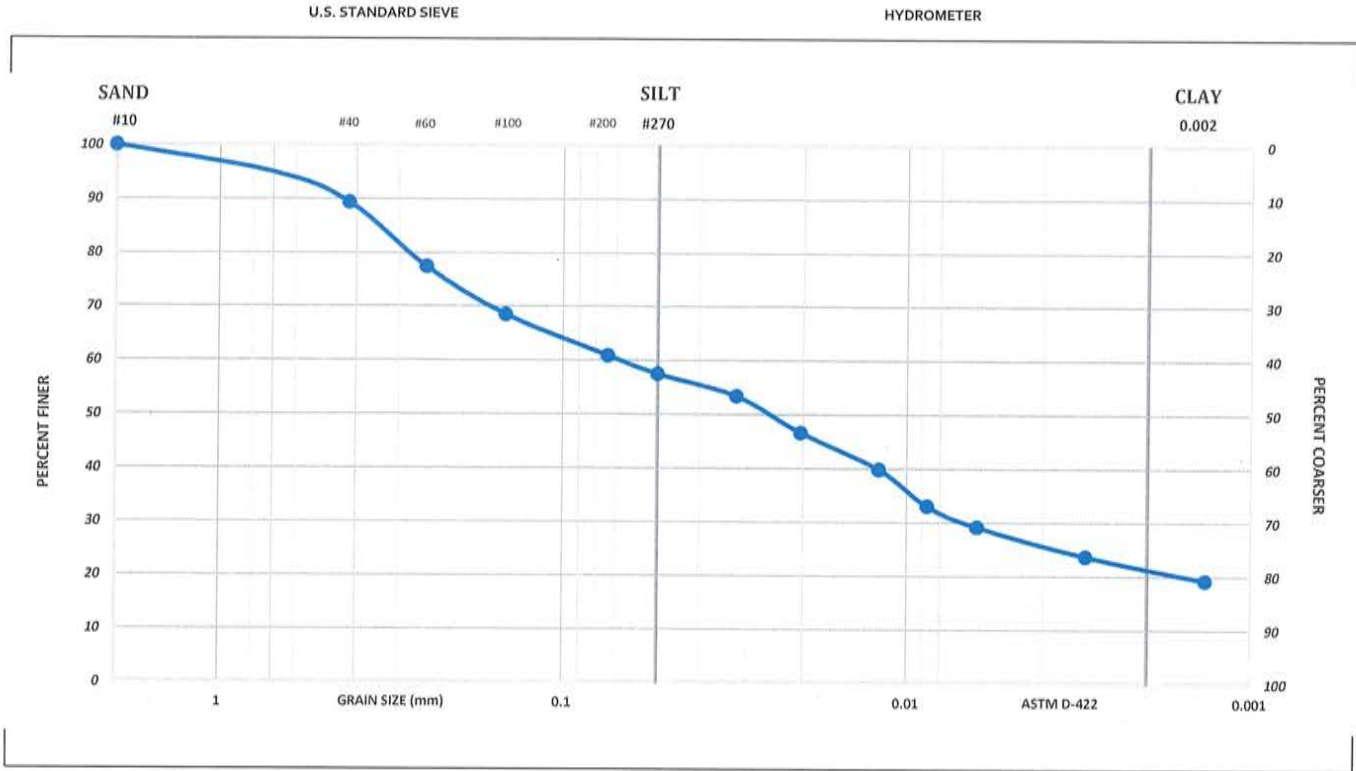
VICTORY VILLA ELEMENTARY SCHOOL

Boring: SWM-4
 Sample: Jar
 Depth: 4.0-5.5'

Project No.: 15228.D
 Sampled: -
 Location: Baltimore, Maryland

JAY KAY TESTING, INC.
 5233 Lehman Road, Suite 110
 Spring Grove, PA 17362
 Phone: (410) 259-5101

USDA RESULTS



PERCENT SAND
42.4 %

PERCENT SILT
36.0 %

PERCENT CLAY
21.6 %

USDA CLASSIFICATION
LOAM

MC	LL	PL	PI	USCS	AASHTO
13.9	-	-	-	-	-

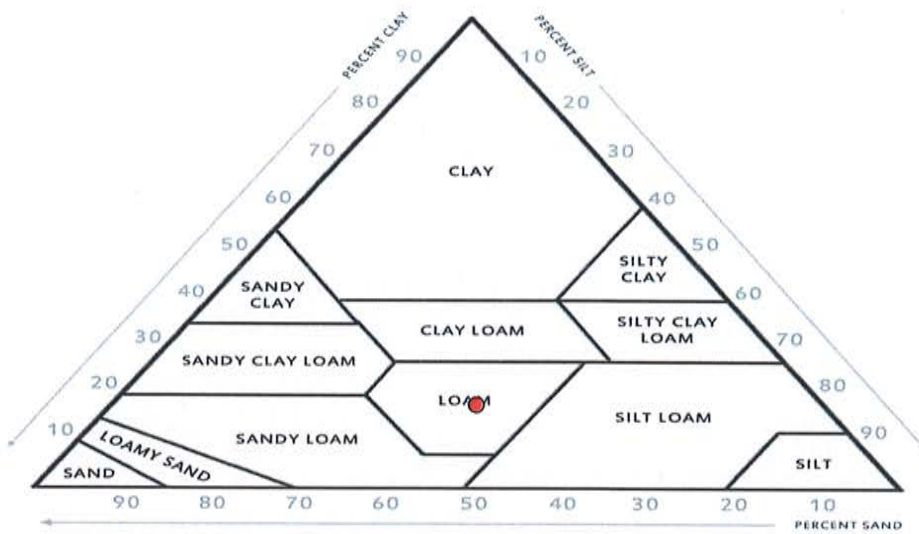
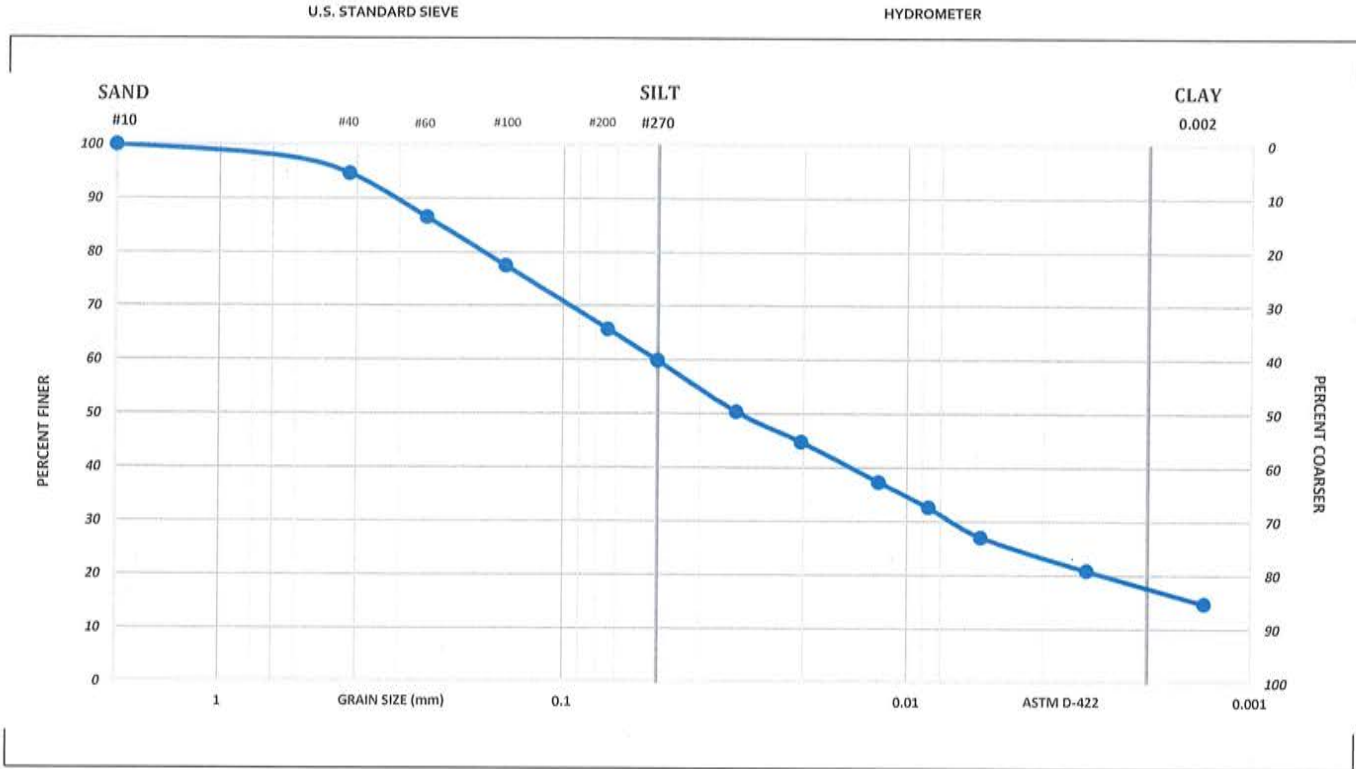
VICTORY VILLA ELEMENTARY SCHOOL

Boring: SWM-5
 Sample: Jar
 Depth: 4.0-5.5'

Project No.: 15228.D
 Sampled: -
 Location: Baltimore, Maryland

JAY KAY TESTING, INC.
 5233 Lehman Road, Suite 110
 Spring Grove, PA 17362
 Phone: (410) 259-5101

USDA RESULTS



PERCENT SAND
40.0 %

PERCENT SILT
42.3 %

PERCENT CLAY
17.7 %

USDA CLASSIFICATION
LOAM

MC	LL	PL	PI	USCS	AASHTO
20.4	-	-	-	-	-

APPENDIX C

Spectral Acceleration Response

USGS Design Maps Summary Report

User-Specified Input

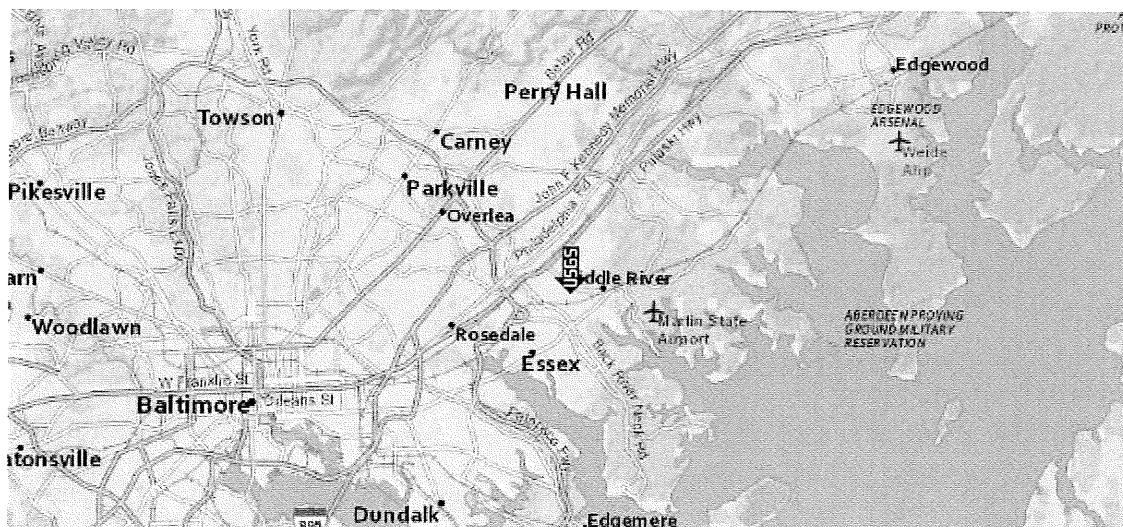
Report Title VICTORY VILLA ELEMENTARY SCHOOL
 Mon March 28, 2016 14:48:43 UTC

Building Code Reference Document 2012 International Building Code
 (which utilizes USGS hazard data available in 2008)

Site Coordinates 39.34152°N, 76.45623°W

Site Soil Classification Site Class D – “Stiff Soil”

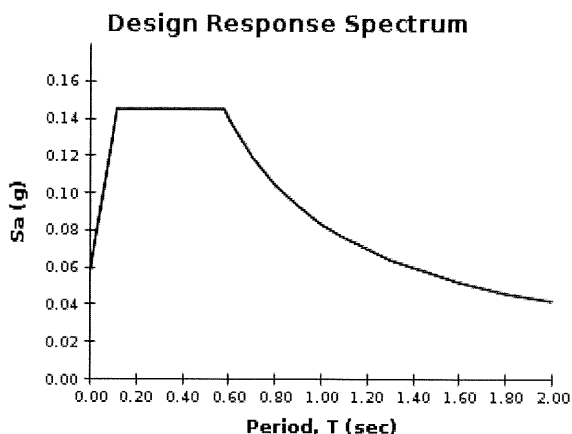
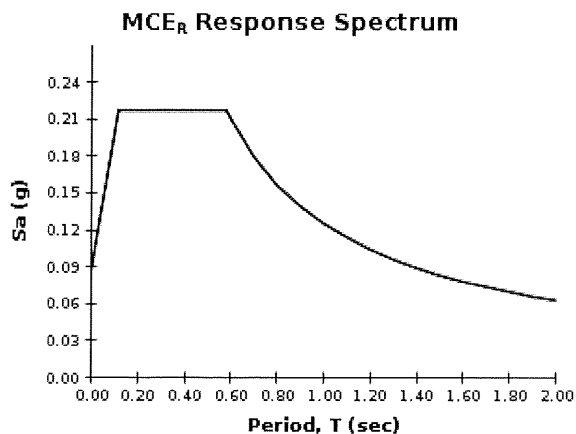
Risk Category IV (e.g. essential facilities)



USGS-Provided Output

$S_S = 0.136 \text{ g}$	$S_{MS} = 0.217 \text{ g}$	$S_{DS} = 0.145 \text{ g}$
$S_1 = 0.052 \text{ g}$	$S_{M1} = 0.125 \text{ g}$	$S_{D1} = 0.083 \text{ g}$

For information on how the S_S and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.



Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.


Design Maps Detailed Report

2012 International Building Code (39.34152°N, 76.45623°W)

Site Class D – “Stiff Soil”, Risk Category IV (e.g. essential facilities)

Section 1613.3.1 — Mapped acceleration parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_5) and 1.3 (to obtain S_1). Maps in the 2012 International Building Code are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 1613.3.3.

From Figure 1613.3.1(1) ^[1]

$S_5 = 0.136 \text{ g}$

From Figure 1613.3.1(2) ^[2]

$S_1 = 0.052 \text{ g}$

Section 1613.3.2 — Site class definitions

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 1613.

2010 ASCE-7 Standard – Table 20.3-1
SITE CLASS DEFINITIONS

Site Class	\bar{v}_s	\bar{N} or \bar{N}_{ch}	\bar{s}_u
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
Any profile with more than 10 ft of soil having the characteristics:			
<ul style="list-style-type: none"> • Plasticity index $PI > 20$, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u < 500$ psf 			
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 1613.3.3 — Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters

TABLE 1613.3.3(1)
VALUES OF SITE COEFFICIENT F_a

Site Class	Mapped Spectral Response Acceleration at Short Period				
	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_s

For Site Class = D and $S_s = 0.136$ g, $F_a = 1.600$

TABLE 1613.3.3(2)
VALUES OF SITE COEFFICIENT F_v

Site Class	Mapped Spectral Response Acceleration at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = D and $S_1 = 0.052$ g, $F_v = 2.400$

Equation (16-37): $S_{MS} = F_a S_s = 1.600 \times 0.136 = 0.217 \text{ g}$

Equation (16-38): $S_{M1} = F_v S_1 = 2.400 \times 0.052 = 0.125 \text{ g}$

Section 1613.3.4 — Design spectral response acceleration parameters

Equation (16-39): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 0.217 = 0.145 \text{ g}$

Equation (16-40): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.125 = 0.083 \text{ g}$

Section 1613.3.5 — Determination of seismic design category

TABLE 1613.3.5(1)

SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD (0.2 second) RESPONSE ACCELERATION

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = IV and $S_{DS} = 0.145 g$, Seismic Design Category = A

TABLE 1613.3.5(2)

SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = IV and $S_{D1} = 0.083 g$, Seismic Design Category = C

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category \equiv "the more severe design category in accordance with Table 1613.3.5(1) or 1613.3.5(2)" = C

Note: See Section 1613.3.5.1 for alternative approaches to calculating Seismic Design Category.

References

1. Figure 1613.3.1(1): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(1\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(1).pdf)
2. Figure 1613.3.1(2): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(2\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(2).pdf)

-----**END**-----

D.W. KOZERA, INC.
PROFESSIONAL ENGINEERS & GEOLOGISTS

November 1, 2016

Murphy & Dittenhafer Architects
805 North Charles Street
Baltimore, Maryland 21201

Attn: Mr. Peter Schwab / Ms. Lauren Myatt
(pjs@murphdittarch.com) / (lmm@murphdittarch.com)

Subject: Addendum No. 1, Geotechnical Engineering Study, Victory Villa Elementary School, 500 Compass Rd, Middle River, Maryland (DWK Contract Number 15228.D)

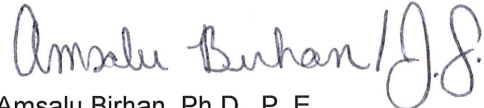
Dear Mr. Schwab:

This addendum, to our geotechnical report dated April 8, 2016, for the new School Building at 500 Compass Road, Middle River, Maryland, outlines the foundation design option of using Rammed Aggregate Piers (RAPs) for foundation support in lieu of the undercut scheme provided in our original report.

We appreciate the opportunity to be of service to you and the project team. Please contact us if you have any questions related to this subsurface investigation report.

Very truly yours,

D.W. KOZERA, INC.

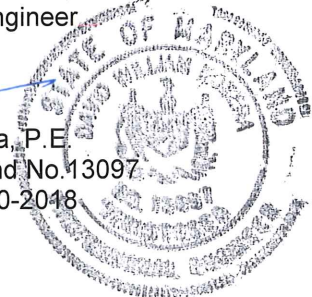


Amsalu Birhan, Ph.D., P. E.
Geotechnical Engineer

I hereby certify that this document was prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 13097, and Expiration Date: 08-20-2018.



David W. Kozera, P.E.
State of Maryland No. 13097
Expiration: 08-20-2018



ec: Site Resources, Inc.
Attn: Mr. Fritz Behlen
(fbehlen@siteresourcesinc.com)
Carroll Engineering, Inc.
Attn: Ms. Kelly Cray, P.E.
(kcray@ceieingeeering.com)

FOUNDATION DESIGN

In order to avoid the undercut of existing fill and replacement with compacted fill, Rammed Aggregate Piers can be utilized. Note that due to the stiff clay at this site, the use of Controlled Modulus Columns (CMC's) is not advisable.

Spread Footings on Rammed Aggregate Piers

One option of ground improvement to increase the stiffness and bearing capacity of the soil beneath a spread footing, in order to decrease the settlements, is use of Rammed Aggregate Piers (RAPs). RAPs vary in design and installation methods, but are generally defined as intermediate depth foundation elements that are constructed by the installation of compacted crushed stone in vertical shafts below spread footing foundations.

RAPs are installed by constructing successive layers of compacted dense graded aggregate in a pre-drilled shaft, typically measuring between 24 and 36 inches in diameter. The aggregate is densified using a patented tamper that delivers a high-energy impact ramming action, or by the use of a solid or hollow vibratory probe. The ramming or vibratory action compacts the aggregate and prestresses the surrounding soils. Additional lifts of graded aggregate are then successively placed, creating a continuous shaft. The high-energy compaction process produces lateral prestraining and prestressing of the adjacent matrix soils that increases the lateral stress in the adjacent soils. The improved soils and the compacted aggregate shaft together increase the strength and stiffness of the supporting soil, allowing for the use of traditional shallow spread footing foundations, while significantly reducing the elastic settlement from the building loads. Note that due to the plastic clays at this site, it is critical to utilize a dense grade aggregate or cement treated aggregate to minimize water infiltration into these clays.

The RAP program is typically designed and installed by a qualified contractor, in conjunction with the information provided by the structural engineer. The contractor should be provided with a copy of the geotechnical engineering report for his use in development of the RAP design. Allowable soil bearing pressure of 5 ksf are expected to be feasible with the use of RAPs. Considerations that could affect the design and installation of the RAPs include: groundwater elevations above the RAP tip elevations; soft or loose soils that may collapse during the excavation of the open shaft; and/or the potential for construction debris to be encountered in the existing fill soils. Based on the groundwater elevation and the caved depths of the test borings, down-hole bottom feed methods of RAP installation may be required at this site. However, due to the stiff clay, some predrilling may be required. It is expected that RAPs installed to a depth of approximately 20 feet below the proposed finished floor elevation will be required.

A minimum of one modulus load test should be specified as part of the installation process to verify the soils strength assumptions used by the RAP designer.

We expect that total foundation settlement of less than one inch, and distortional settlement of 0.002 in/in can be expected when spread footings are placed in accordance with the recommendations provided in this report. In order to preclude punching type bearing capacity failures, wall footings shall have minimum widths of 30 inches, and any column footings shall have minimum widths of 48 inches. A maximum slope of 2H: 1V should be maintained between the bottom edges of adjacent footings where foundation grades are at different levels. As these foundations will be supported on the Rammed Aggregate Piers, the footings can be placed at least 30 inches below final exterior grade for frost protection. It is also recommended that wall footings be provided with adequate reinforcement such that sufficient bending strength is available to span across isolated pockets of soft or loose soils (that may go undetected during construction).