BALTIMORE COUNTY PUBLIC SCHOOLS

Creating a Culture of Deliberate Excellence 6901 N Charles Street, Building "E" Towson, MD 21204

Division of Business Services

Department of Fiscal Services An Affirmative Action Employer Office of Purchasing

SOLICITATION AND SPECIFICATIONS

For

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

Volume 1 of 2 DIVISIONS 0 - 14

PRE-BID:	December 1, 2016 @ 10:00 AM Baltimore County Public Schools Department of Physical Facilities 9610 Pulaski Park Drive, Suite 213 Baltimore, MD 21220
RETURN TO:	BALTIMORE COUNTY PUBLIC SCHOOLS Office of Purchasing RE: MBU-516-17 Attn: Melvin E. Burley, Purchasing Agent 6901 N Charles Street, Building "E" Towson, MD 21204
BID NUMBER:	<u>MBU-516-17</u>
BID ISSUED DATE:	<u>November 17, 2016</u>
DUE DATE:	<u>December 15, 2016</u>
DUE TIME:	NO LATER THAN 2:00 PM (Eastern Time Zone)
PUBLIC OPENING:	December 15, 2016, (10 minutes after due time) Conference Room 6901 N Charles Street, Building "E" Towson, MD 21204

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.

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.

Project Manager: Douglas Mullins - Phone: (443) 809-9239 - FAX: (410) 887-6314 E-mail: <u>pmullins@bcps.org</u>

BALTIMORE COUNTY PUBLIC SCHOOLS

Creating a Culture of Deliberate Excellence 6901 Charles Street, Building "E"

Towson. MD 21204

Division of Business Services

Office of Purchasing

00100 NOTICE TO CONTRACTORS

Department of Fiscal Services

The Board of Education of Baltimore County invites Contractors to bid on the **NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL and the DEMOLITION OF THE EXISTING LANDSDOWNE ELEMENTARY SCHOOL** [commodity code 90927], under solicitation number **MBU-516-17 (PSCP#03.105.17 LPC)**. The cost for this work is projected to fall within Contract Cost Group **H: OVER \$15 MILLION.** Procurement questions can be emailed to **Melvin E. Burley**, Purchasing Agent at mburley2@bcps.org or they may be faxed to his attention at 410-887-7831. Verbal questions will not be taken.

Contractors proposing to bid may order contract documents after 2:00 PM beginning <u>Thursday, November 17,</u> <u>2016</u>, through <u>www.bcps.org</u>.Click on the "Our System" tab at the top right of the aforementioned web address, click on "Offices," click on "Purchasing Office," click on "Bid Board" on the left, and then click on the "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 for this procurement is scheduled for <u>December 1, 2016 at 10:00 AM</u> at the Office of Physical Facilities, 9610 Pulaski Park Drive, Suite 213, Baltimore, MD 21207.

The last day for written questions is December 6, 2016 and the final Addendum will issued by December 8, 2016.

Sealed bids will be received until <u>Thursday December 15, 2016, no later than 2:00 PM</u> in the Office of Purchasing at Baltimore County Public Schools Office of Purchasing, located at 6901 N Charles Street, Building "E", 1st Floor, Towson, MD 21204. A public bid opening will be held 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) Classification "I", BUILDINGS, Category 1, NEW BUILDING CONSTRUCTION
- AND Classification "I", BUILDINGS, Category 7, DEMOLITION, prior to the date of bid opening.

A copy of the pre-qualification certificate of the contractor shall be included with their proposal/bid.

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 29 percent (29%) 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 sub goals established for this project are 7 percent (7%) from African American-owned businesses and 4 percent (4%) from Asian–owned businesses. 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.

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

Purchasing Manager

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VOLUME 2

BALTIMORE COUNTY PUBLIC SCHOOLS - OFFICE OF PURCHASING

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

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PART I: GENERAL TERMS AND CONDITIONS

1 **DEFINITIONS**

1.1 BCPS

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

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 proposal/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 Applicable Definitions

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

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 Bid

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 Base Bid

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 Alternate Bid

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 Unit Price

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 Bidder

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 Award Bidder

An Award Bidder is a person or entity that submits a Proposal/Bid and has been approved by the Board of Education for award.

1.11 Sub-Contractor

A Sub-contractor is a person or entity that submits a proposal or bid to an Award Bidder for materials, equipment, or labor for a portion of the Work.

2 AN INVITATION TO BID

2.1 Invitation

Baltimore County Public Schools invites all interested and qualified Bidders to submit a proposal/bid. These specifications intend to cover the purchase of the 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 Advertising

In accordance with State law and BCPS policies, notices and announcements shall be published a minimum of 14 calendar days in advance of the due date for any proposals/bid having a potential award value of \$25,000 or more.

2.3 Receipt of Bids

BCPS shall receive sealed proposals/bids until date and time indicated in the solicitation or as modified by addenda. Proposals/Bids must be delivered to the <u>BCPS Office of</u> <u>Purchasing located at 6901 Charles Street</u>, <u>Building "E"</u>, <u>Towson. MD 21204</u> 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.

Unless otherwise indicated, sealed proposals/bids will be opened and publicly read at the stated time.

2.4 Brand/Model Reference

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 Misunderstandings & Errors

The Bidder or their authorized representatives are expected to fully inform themselves fully 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, the percentages mark-up(s)/discount(s) indicated, the unit price(s) shall govern or the entire bid may be declared non-responsive.

2.6 Recommendation

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 by mail, telephone, or purchase order of their award(s). When applicable, a BCPS contract document shall also be issued.

2.7 One Price

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 Individual, Group or Aggregate Bidding

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: SPECIFICATIONS -- TECHNICAL SPECIFICATIONS.

2.9 Product Offered

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 Working Drawings

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 BID PREPARATION, PROPOSAL SHEET, AND BID OPENING

3.1 Proposal Submission

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 Returning Bids

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 solicitation.

3.3 Bid Identification and Mailing

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 Certificates and Affidavits

All bidders shall be required to complete the certificates and/or affidavits and/or acknowledgments that are incorporated into the proposal pages of this solicitation. 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 Bid-Posting/Tabulation Sheet Availability

At the public opening of the bid, the bidder's names and their prices will be read and posted.

3.5.2 Proposal Review

A complete evaluation 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 Final Recommendations

Final recommendation(s) shall be prepared for review and approval by the Board of Education of Baltimore County.

3.5.4 Award Availability

The recommended award will be available in the Office of Purchasing after the completed evaluation.

3.5.5 Review of Bid Documents

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 Bidder Obligations

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(s).

3.7 Reporting Omissions, Errors or Discrepancies

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 MULTIAGENCY PROCUREMENT

4.1 Rights Reserved

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 Jurisdictional Contracting

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 BID SECURITY

5.1 Bid Bond

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 Surety Bond Format

If a surety bond is required, it shall be written on AIA Document A3I0 - Bid Bond, unless otherwise provided in the Solicitation 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 Retaining Bid Security

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 proposals/bids may be withdrawn or (c) all proposals/bids have been rejected.

5.4 Bond Approval

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/Payment Bonds

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) 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

Performance Bond shall be required for contracts and/or awards of construction contracts in excess of \$30,000.00 for 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

acceptable on bonds given to the United States Government and approved by the Board of Education of Baltimore County and are authorized to transact business in this State. Performance Bonds shall be made out in the name of the "Board of Education of Baltimore County". They shall be forwarded to the Office of Purchasing, Contracting Assistant at 6901 Charles Street, Building "E", Towson, MD 21204.

5.5.2 Payment Bond

Payment Bond shall be required for contracts and/or awards of construction contracts in excess of \$30,000.00 for 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 <u>"Board of Education of Baltimore County"</u>. They shall be provided to the <u>Office of Purchasing, Contracting Assistant at 6901</u> Charles Street, Building "E", Towson, MD 21204.

5.6 Checks in Lieu of Bonds

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 Manager. 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 or payment.

5.6.1 Check Deposit

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 Check Addressee

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

5.7 Letters of Credit

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.

A letter 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, MD 21204.

5.8 Acceptable Bid Security

5.8.1 Irrevocable Trust Receipt

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 Evidence of Denied Credit

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

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;

- 5.8.3.1 Cash or Certificates of Deposit
- 5.8.3.2 Cash Equivalents

Cash equivalents held with a federally insured financial institution,

5.8.3.3 Assets

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:
 - 5.8.4.1 Notes or accounts receivable and,
 - 5.8.4.2 Foreign securities and,
 - 5.8.4.3 Real property as follows:

5.8.4.3.1 Outside of State

Real property located outside of the State and,

5.8.4.3.2 Principal Residence

Real property that is the principal residence of the surety and,

5.8.4.3.3 Owned Concurrently

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 Real Property Surety

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

5.8.5.1 Certificate of Title

Evidence of title in the form of a certificate of title prepared by an attorney or a title insurance company licensed by the State;

5.8.5.2 Title Evidence

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 Unacceptable Individual Surety

The following are not acceptable as an individual surety

- 5.8.6.1 A Corporation, Partnership, or other Unincorporated Association or Firm
- 5.8.6.2 A member of a Partnership, if that member is a principal obligor
- 5.8.6.3 Stockholders of corporate principals are acceptable as individual sureties, provided their qualifications are independent of the stockholder's financial holdings.
- 5.8.7 Evidence of Title

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 TIE BIDS

6.1 Tie Bids - Award Order of Preference

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-state minority and/or small business enterprise vendor is enterprise vendor.

6.2 Tie Bids - Resolved with Coin Toss

In the event a tie bid still exists, the Manager 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 BID PRICES

7.1 Withdrawing Submission

Any bidder may withdraw his bid submission prior to the bid opening date and time specified. After this, BCPS has a period of 120 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 Rounding of Prices

Unit Prices must be rounded off to no more than two (2) decimal places, unless otherwise specified in Part II, Specifications.

7.3 Cash Discounts

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 Price Reductions

BCPS reserves the right to accept price reductions from the award bidder during the term of this contract.

7.5 Non-Acceptance

BCPS will not accept any proposals with bidder escalator clauses, unbalanced figures, or irregular features.

7.6 Contradictory Terms

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 TAXES AND PERMITS

8.1 Non-Tax Exemption

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 Permit Fees

Award Bidders shall obtain and pay for any permits required and provide a copy to BCPS as well as post a copy on site.

9 BILLING AND PAYMENTS

The Award Bidder(s) agree to honor payment by BCPS VISA card.

9.1 Invoice Submittal

All invoices are to be signed, sealed, notarized, submitted in Duplicate and mailed or sent via e-mail to:

Baltimore County Public Schools Department of Physical Facilities, Engineering and Construction 9610 Pulaski Park Drive, Suite 204 Baltimore, Maryland 21220 ATTN: Douglas Mullins/ Jim Proutt

9.2 Expediting Payment

To expedite payments ALL invoices must contain a valid Baltimore County Public Schools' purchase order number.

9.3 Full Payment

Payment in full will only be made upon completion of contract.

10 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 of competent jurisdiction located in Baltimore County, Maryland.

11 ADDENDA

11.1 Changes to Specifications

All changes to the bid specifications will be made through appropriate addenda issued from the Office of Purchasing.

11.2 Addenda Availability

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 Addenda Copies

Copies of Addenda will be made available for inspection wherever Bid Documents are on file.

11.4 Addenda Issuance

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 Addenda Receipt & Acknowledgement

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 INSURANCE

12.1 Award Bidder's Liability Insurance

12.1.1 Insurance Provider Acceptability

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:

12.1.1.1 Claims

Claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts;

12.1.1.2 Claims for Employees

Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

12.1.1.3 Claims for Non-Employees

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

12.1.1.4 Claims for Insured Damages

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;

12.1.1.5 Claims Other Than to Work

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;

12.1.1.6 Claims Related to Use of Motor Vehicle

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,

12.1.1.7 Claims Related to Dishonesty

Claims for damages because of employee dishonesty by any of the Award Bidder's employees are acceptable.

12.1.2 Required Insurance

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

12.1.2.1 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 Contractors';

(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.

12.1.2.2 Comprehensive Automobile Liability

Liability - \$1,000,000 Personal Injury Protection – Statutory Uninsured Motorists - Statutory

12.1.2.3 Workers' Compensation

Maryland Benefits – Statutory Employer's Liability - \$100,000

12.1.2.4 Prime Contractor Pollution Liability

Each Occurrence Limit: \$1,000,000 General Aggregate Limit: \$1,000,000

Claims Made on Occurrence Forms are acceptable

12.1.3 Certificate of Insurance

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. <u>The Certificate of insurance must name the Board of Education of Baltimore County as an additional insured.</u>

12.2 Liability Insurance - BCPS

BCPS' 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 Property Insurance & BCPS

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 secure 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 Boiler & Machinery Insurance

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 Insured Loss Adjustment

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 Maintaining Copies/Policies

BCPS maintains a copy of all policies, which are available to the Award Bidder for inspection prior to exposure to loss.

12.3.5 Additional Insurance Risks and Costs

If the Award Bidder requests in writing that insurance for risks other than those described in Subparagraph 12.3.1 (above) or other special hazards are included in the property insurance policy, if possible BCPS shall include such insurance. An appropriate Change Order shall charge the cost thereof to the Award Bidder.

12.3.6 Insured Loss and Replacement of Damaged Work

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, an appropriate Change Order shall cover replacement of damaged work.

12.3.7 Loss Settlement

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 were 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 Waiver of Rights

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 Sub-contractors, 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, Sub-contractors 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 Use of Work Area

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 because 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 Evidence of Insurance

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-day (30) 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 Required Coverage

All <u>Required Insurance Coverage</u> 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 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 because of such purchases will be deducted from the monies owed or monies that may become due.

14 TERMINATIONS/SUSPENSIONS FROM CONTRACT

14.1 Termination by BCPS for Cause

14.1.1 Reasons for Termination of Contract

BCPS may terminate the Contract if the Award Bidder:

14.1.1.1 Workers

Persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

14.1.1.2 Subcontractor Payment

Fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Award Bidder and the Subcontractors;

14.1.1.3 Disregard for Law(s)

Persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or

14.1.1.4 Breach of Provision(s)

Otherwise is guilty of substantial breach of a provision Of the Contract Documents such, but not limited to: (I) 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 Termination of Employment and Action taken

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:

14.1.2.1 Taking Possession of Site

Take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Award Bidder

14.1.2.2 Assign Subcontractor

Accept assignment of subcontracts and

14.1.2.3 Complete Work

Finish the Work by whatever reasonable method BCPS may deem expedient.

14.1.3 Non-Retention of Award

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 Halt in Payment

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 Unpaid Balances and Work Completion

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 Contractor Waiver

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 Discontinuance of Work

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 Contractor Obligations

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 Contractor's Agreement

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

14.3 Right to Terminate

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

15 DRUG, TOBACCO, AND ALCOHOL FREE ZONES

15.1 Prohibition

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 Subsequent Offense

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 APPEAL PROCESS

16.1 Appeal Notification

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 Appeal at Purchasing Agent Level

For an appeal of recommendation of award of contract, the Manager, Office of Purchasing, shall review the decision of the Purchasing Agent. 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 Appeal After Board Approval

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 <u>"End-User" Department's Executive Director</u>. This action shall occur no later than seven days from the date of award of contract. The <u>Department's Executive Director</u> reserves the right to meet with the protesting Bidder as a part of the appeal investigation. The Executive Director, will issue a formal written decision, in a timely manner.

16.1.3 Furtherance of Appeal

If a Bidder wishes to pursue the appeal of an award of contract further, administrative procedures have been established for such action. These procedures will be outlined at the time the appeal is made.

16.2 Appeal of Suspension or Termination

16.2.1 Protest

Any Award Bidder objecting to their Suspension or Termination may protest the action to the *"End User"* Department by formally notifying the <u>Executive Director</u>

<u>[or his designee]</u> in writing within fourteen (14) calendar days from the date of the notification. The Award Bidder shall have an opportunity to meet with the <u>Executive Director</u> or his designee, to present his issues.

16.2.2 Use of Administrative Process

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 Continuation of Work Under Appeal

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: Non-Appropriation or Loss of Appropriated funds

NONE

16.5 Cost of Appeal

Any costs incurred in the appeal process will be borne by the bidder(s) in all instances.

17 LITIGATION PROCEDURES

17.1 Questions

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, 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 Interpretation(s)

All questions involving interpretation of the Contract Documents that involve a value of \$10,000 or more, and cannot be resolved between the Award Bidder and BCPS <u>Manager</u> shall be referred to the <u>Departmental Administrator</u> for a review. If the Award Bidder is not satisfied with the decision rendered, the matter may be appealed to the <u>Department's Executive Director</u>.

17.3 Use of Administrative Procedures

If the Award Bidder is unsatisfied with the decision of the <u>Executive Director</u>, 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 DISCRIMINATION

18.1 Non-Discrimination and Affirmative Action

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 BCPS, setting forth the provisions of this nondiscrimination clause.

18.2 Notice to Workers and Worker Representatives

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 Compliance Report

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 Non-Compliance

In the event of 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 Special Provisions

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 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 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 AMERICANS WITH 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 Office of Purchasing at least seventy-two (72) hours in advance of the published bid opening date and time to arrange for such services.

22 NON-HIRING OF EMPLOYEES BY AWARD BIDDER OR BCPS

22.1 BCPS Employees

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 contact, 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 Award Bidder Employees

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 contact, 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 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 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 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 ANNULMENTS AND RESERVATIONS

26.1 Proposal Rejection

BCPS reserves the right to reject any or all proposals and re-advertise for other bids.

26.2 Waiver of Technical Defects

BCPS reserves the right to waive technical defects within submittals.

26.3 Right to Order/Not Order

BCPS reserves the right to order the said equipment, materials, supplies, or services as described within the specifications, and reserves the right not to order any.

26.4 Investigation(s)

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 Annulling Contract

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 Failing to Comply

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 Circumstance(s) Beyond Award Bidder's Control

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 Reserved Rights – Blanket Purchase Order

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 Reserved Rights - Best and Final Offers.

BCPS reserves the right to discussions resulting in Best and Final Offers (BAFO)

26.7.1 Invitation to Ranking Finalist

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 based on 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 Further Discussions

Should BCPS determine that further discussions would be in the best interests of BCPS, the Purchasing Agent shall establish procedures and schedules for conducting discussions and will notify qualified Bidders.

26.7.3 Proposal Revisions

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

Licenses for boilers, equipment, or buildings are the responsibility of BCPS and shall not be part of this Agreement.

26.9 Bid Rejection

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 that is in any way incomplete or irregular.

27 DELIVERY REQUIREMENTS

27.1 Deliveries

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 Supplies and/or Materials

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, must hold all supplies and/or materials. 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 INSPECTIONS

28.1 Inspectors and Inspections

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 Responsibility for Faulty Workmanship

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 that 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 COMPLIANCE WITH SPECIFICATIONS

29.1 Compliance with Intent of Specifications

The bidder shall abide by, 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 Submission of Drawings/Descriptive Data

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 Specification Requirements

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 Mandatory Requirements

Where the requirements of the laws, ordinances, etc., are mandatory, they shall govern.

29.5 Specification Conflicts

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 GUARANTEE AND WARRANTY

30.1 Unconditional Guarantee

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 Failure(s)

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 unworkmanlike 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 Warranty Claims

The Award Bidder must act as the manufacturer's agent for all warranty claims.

31 SUBCONTRACTORS

31.1 Subcontractor Approval

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 Assigning Authority

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 Assigning Money

The Award Bidder shall not, assign any of the moneys payable under the contract, without prior written consent of BCPS.
32 AWARD BIDDER'S RESPONSIBILITY

32.1 Certificate of Registry

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 Damages to BCPS Property

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 Bidder Employee Sign-In/Out

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 Worksite Cleanliness

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 are Award Bidders to use BCPS Garbage or recycling dumpster to dispose of debris.

32.5 On-Site Utilities

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 Utility Service Interruptions

Award Bidders are responsible for coordinating planned interruptions of utility service with BCPS.

32.7 Notification of Pre-Existing Conditions

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 AIA Agreement

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 Materials, Tools and Equipment

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 Presumption(s)

At the time of the opening of bids, each bidder will be presumed to have inspected the site, to read, and to be thoroughly familiar with the Solicitation, Specifications, 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 Employee Background Checks & Notification

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 Performance Evaluation

32.12.1 Board policy

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.

32.12.2 Thresholds Mandating Evaluation

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.

32.12.3 Method of Evaluating Performance - Large Projects

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 Reports

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 SAFETY AND CODE REQUIREMENTS

All materials and labor shall comply with the following requirements:

33.1 Federal, State and Local Law Compliance

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 Non-Discrimination

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 Equipment / Machinery - Safety Regulation Compliance

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 MOSH meeting the CFR-1910 MOSH Standard.

33.4 Material Safety Data Sheets (MSDS)

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

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 American Society of Testing and Materials ASTM AWS American Welding Society American Water Works Association AWWA Building Officials and Code Administrators BOCA COBA **Council of American Building Officials** CPSC **Consumer Product Safety Commission** CS **Commercial Standard** FΜ Factory Mutual Institute of Boiler and Radiator Manufacturers IBR 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 Asbestos Free Materials

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 materials that are tightly bound (e.g. floor tile, 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 Lead Free Materials

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 BCPS.

33.8 Relevant Codes

All Baltimore County codes and regulations including the latest edition of <u>the International</u> <u>Building Code</u> are relevant.

33.9 Relevant Law

Public Law 91-596 dated December 29, 1970, entitled Occupational and Health Act of 1970.

33.10 The Americans with Disabilities Act (ADA)

Award Bidder shall insure that all modifications address the provisions of the ADA

34 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 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 INDEMNIFICATION

35.1 BCPS & BCBE Held Harmless

To the fullest extent permitted by law, the Award Bidder shall indemnify and hold harmless the Baltimore County Public Schools (BCPS) and the Baltimore County Board of Education (BCBE) 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 Obligation Limitation

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 Prohibition Against Extending Obligations

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 (I) 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 BCPS Not Responsible

Baltimore County Public Schools shall not be responsible for errors or omissions made by the printer or advertising house, which prepared the Solicitation/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 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 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 LIABILITY FOR LOSS OF DATA

In the event 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 SUSPENSION OF WORK

39.1 Authority to Suspend, Delay or Interrupt Work

BCPS may unilaterally order the Award Bidder in writing to suspend, delay, or interrupt all or any part of the work for such period as may be appropriate for the convenience of the BCPS. Such suspensions, delays, or interruptions should be for less than sixty-days (60) unless there are extenuating circumstances.

39.2 Adjustment to Completion Time

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 Re-Mobilization Compensation

BCPS will compensate the Award Bidder only for the cost(s) to re-mobilize to the Facilities and 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 DELAYS, EXTENSIONS OF TIME

40.1 Timely, Continuous and Diligent Performance

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 Commencement Date Guarantee

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 HAZARDOUS MATERIALS

41.1 Requirements, Warrants and Representations

The Award Bidder's work and other services pursuant to or in connection with this Agreement may include 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 during the Technical Proposal shall be the exclusive responsibility of the Award Bidder.

41.2 Notification if Aware or Suspect Hazardous Material

Should the Award Bidder become aware of or suspect the presence of Hazardous Materials, other than already disclosed by BCPS within the Technical Proposal, 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 and/or when the affected area has been rendered harmless. Except as set forth in the Technical Proposal, 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 BIDDER SUBMITTALS

BIDDERS MUST SUBMIT THE FOLLOWING:

42.1 Insurance Certificate

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 <u>within 10 days of being notified of being the</u> <u>apparent award bidder</u>. The Insurance Certificate must name the "<u>Board of Education</u> <u>of Baltimore County</u>" as the "additional insured".

42.2 Worker's Compensation and Employer Liability

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 <u>within 10 days of being notified of being the apparent award bidder:</u>

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-day (30) prior written notice to the Board of Education of Baltimore County.

42.3 Certificate of Registry

Award Bidders shall be required under Article 56, Section 270(4) of the 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 10 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]

42.4 Evidence of an Ability to Provide Required Services

Award Bidders, who cannot provide evidence of having the personnel and equipment to provide the required services in a satisfactory, 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.

42.5 Objection(s)

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, (I) 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 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 paragraph 43.2.

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

43.1 Substitutions Prior to Advertisement(s)

Substitutions will be considered prior to the initial advertisement for bids and after receipt of bids.

43.2 Proposed Substitutions

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 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 OWNER'S RIGHT TO STOP THE WORK

45.1 Stop Work Order

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 Suspension of Work – Unforeseen Conditions

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 due to such suspension. In any event, where the Award Bidder reasonably determines that a suspension is required in such circumstances, the Award Bidder must promptly notify in writing BCPS and Architect of such determination.

46 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 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 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 CONFLICT OF INTEREST, LOBBYING, AND ETHICS REVIEW PANEL

48.1 Compliance with Ethics Policies

In accordance with paragraph 15-811 through 15-815 of the State Government Article of the Annotated Code of Maryland, the Board of Education of Baltimore County has promulgated Ethics Policies that 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 Conflict(s) of Interest

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 Questions / Interpretations

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 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 <u>will not be rescheduled</u>

<u>unless an addendum is issued.</u> 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 proposal/bid is "DUE", or prior to the due time, that **bid will be due** <u>at the same time the next day</u> that the Baltimore **County Schools "offices" are open.** The bid opening shall not be impacted if Baltimore County Schools "schools" are closed.

49.3 Late Opening – Early Closing

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 <u>at the same time the next day</u> 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 schools" close early, due to inclement weather, the Bid Due Date and Time of Opening will be conducted AS schools" close early, due to inclement weather, the Bid Due Date and Time of Opening will be conducted AS SCHEDULED.

50 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 FOREIGN LANGUAGE TRANSLATOR REQUIREMENT

51.1 On-Site Interpreter

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 to Provide and Interpreter

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 EMPLOYMENT OF CHILD SEX OFFENDERS

52.1 Knowingly Employing A Sex Offender

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 Knowingly Assigning A Sex Offender

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 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 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 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/proposal documents contain any of the 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 CRIMINAL BACKGROUND CHECKS

56.1 Unsupervised Direct Access to Children

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 No Contact with Children

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- OFFICE OF PURCHASING

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

PART II: SPECIFICATIONS - - GENERAL REQUIREMENTS

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PART II: SPECIFICATIONS--GENERAL REQUIREMENTS

(If there is a discrepancy between specifications of Part I: General Terms and Conditions <u>and</u> Part II: Specifications--General Requirements: <u>Part II Specifications shall prevail</u>)

1 GENERAL SCOPE & SERVICES

1.1 **Project Summary**

The specifications that follow are being offered to qualify and select a contractor to Demolish and Build New Lansdowne Elementary School for Baltimore County Public Schools (BCPS). The scope of work consists of, but is not limited to, demolition of the existing school and the construction of a new school and other associated work.

1.2 Award Bidder Responsibility

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 Funding Contingency

The purchase of these services is 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 Confirming Existing Conditions

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 Bidder Obligations

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 Proposal Submission

All proposals shall be submitted on the proposal form(s) provided by BCPS. All blank spaces shall be filled in, in ink and properly signed.

1.7 Withdrawal and Price Hold

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 (120) calendar days of bid opening without an increase in bid price or change in time of Project completion.

1.8 Work Approval and Corrections

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 Compliance with Codes

The Award Bidder shall comply with all applicable Baltimore County building, fire, plumbing, electrical and sediment control requirements. 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 Inspections

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 Failure to Execute Contract

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 Bidder's Withdrawal of Proposal/Bid

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 re-bid 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 Omissions, Errors, Conflicts or Discrepancies

Any omissions, errors, conflicts, or discrepancies in this document shall be called to the attention of BCPS immediately.

1.14 Cost Group

The Baltimore County Department of Public Works' cost group for this project is **B - \$100,000 TO \$500,000**

2 INCORPORATION OF SOLICITATION, TECHNICAL SPECIFICATIONS & DRAWINGS

The conditions contained in this solicitation, drawings and attachments, by their issuance, become a part of the contract requirements; by order of the Board of Education of Baltimore County

2.1 AIA Contract Documents

AIA Contract Documents are attached and are hereby made a part of the contract document.

2.2 Bid Document Order of Precedence

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

- 2.2.1 Technical Specifications, Divisions 00 through 16;
- 2.2.2 Drawings;
- 2.2.3 Part II: Specifications - General Requirements;
- 2.2.4 Part I: Terms and Conditions.

3 QUALIFICATION(S) OF BIDDER

3.1 Bidder Pre-Qualifications

All bidders shall be pre-qualified by Baltimore County Department of Public Works (BCDPW) Classification "I", BUILDINGS, Category 2, RENOVATIONS prior to the date of bid opening.

3.2 Asbestos / Lead Abatement Sub-Contractors

The asbestos/lead sub-contractor utilized on this project must be pre-qualified by BCDPW Category "I", Buildings, Classification Number 8, ("Asbestos Removal/Encapsulation") and Classification Number 9 (Lead Paint Abatement), prior to the date of bid opening. Award Bidder shall not perform any asbestos/lead abatement using its own forces, unless such Award Bidder is pre-qualified by BCDPW Category "I", Buildings, Classification Number 8, ("Asbestos Removal/Encapsulation") and Classification Number 9 (Lead Paint Abatement), prior to the date of bid opening.

3.3 Window Sub-Contractors

NOT USED

3.4 Contracting Team

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.

3.5 **Pre-Qualification Certificate(s)**

Copies of the bidders Certificate of Prequalification, as issued by the BCDPW, shall be included in the proposal submitted to BCPS by the specified bid due date and time.

3.6 Baltimore County's Department of Public Works

The website address/contact information for the Baltimore County Department of Public Works (BCDPW) is as follows:

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.

3.7 MBE Participation Assistance

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) <u>http://mbe.mdot.state.md.us/directory/</u>.

3.8 Place of Business

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.

3.9 References

Bidders shall also provide at least three (3) names of contact persons and phone numbers; references of similar size and scope contracts during the past eighteen (18) months--on the "REFERENCES" form provided.

3.10 Review of Prior BCPS History

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 proposal/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.

3.11 Investigation(s)

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.**

3.12 Failure to Complete a Contract

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.

3.13 Bid/Proposal Rejection

BCPS expressly reserves the right to reject the bid/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.

3.14 Bidder Rejection

Consideration will be given to any previous performance with BCPS as to the quality and the acceptability of bidder's services. A bidder may be rejected as non-responsible if that bidder has not satisfactorily completed any contract for BCPS. Unsatisfactory performance shall include, but not be limited to any one or more of the following:

3.14.1 Failure to Submit Required Documents

On a previous and/or current bid/project, the Bidder failed to provide all submittals as scheduled.

3.14.2 Failure to Start On Scheduled Date

On a previous and/or current bid/project, the Bidder failed 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.

3.14.3 Failure to Provide Supervision

On a previous and/or current bid/project, the Bidder failed 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.

3.14.4 Failure to Provide Trained Employees

On a previous and/or current bid/project the Bidder failed 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.

3.14.5 Failure to Provide an Adequate Number of Employees

On a previous and/or current bid/project, the Bidder failed to provide an appropriate number of individuals on site to perform the work required continuously throughout the contract.

3.14.6 Failure to Complete All Work

On a previous and/or current bid/project, the Bidder failed to complete all work as defined in the Bid Documents or to meet and/or exceed the specifications without having to be instructed to make corrections repeatedly.

3.14.7 Failure to Complete Work On time

On a previous and/or current bid/project, the Bidder failed 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.)

3.14.8 Failure to Use Assistance/Sub–Contractor or Schedule Work;

On a previous and/or current bid/project, the Bidder failed to utilize subcontractors that results in work not meeting and/or exceeding the specifications and/or no able to schedule their work to expedite the completion of the project. Note: The use of sub-contractors, without prior written consent [from BCPS] is reason for termination of the contract immediately for cause.

3.14.9 Failure to Protect BCPS Interests

On a previous and/or current bid/project, the Bidder failed to properly protect BCPS' property, employees, students, and/or the public.

3.14.10 Failure to Exercise a Contract

On a previous and/or current bid/project, the Bidder failed to enter into a contractual agreement upon recommendation of award.

3.14.11 Failure to Complete a Project

On a previous and/or current bid/project, the Bidder failed to complete a project without having to execute a change order (other than one that changed the scope of work).

3.14.12 Other Criteria

Review and/or failure on other criteria as determined to be of importance to BCPS for proper project execution.

3.15 Bidder Disqualification

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 INSPECTION(S) OF SITE

To aid Bidders with formulation of pricing associated with this solicitation all Bidders are invited to visually inspect the project site. Site visits shall be coordinated as follows:

4.1 Site Visit

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 has observed and assessed the complete 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 Bidder Obligation

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 Coordinating Site Visit

To aid Bidders with formulation of pricing associated with this solicitation, all Bidders are invited to visually inspect project site. Site visits shall be coordinated as follows:

4.3.1 Scheduling Site Visit

A site visit can also be coordinated through the Project Manager, Mr. Douglas Mullins [443-809-9239].

4.3.2 Sign-In

On the day of appointment, you must sign in at main office and provide a picture ID [driver's license, etc.]. The Building Service leader will provide an escort.

4.3.3 Site Information

LANSDOWNE ELEMENTARY SCHOOL 2301 Alma Road Baltimore, MD 21227

4.3.4 Directions:

5 BONDING AND CERTIFICATES OF INSURANCE

5.1 Bid Bond

5.1.1 Submission and Percentage

Each bid must be accompanied by a Bid Bond on an AIA Document A-310 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 <u>five percent (5%)</u> 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 Return of Bid Bonds

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 Surety Statement

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 <u>ELEVATOR</u> <u>REPLACEMENT FOR WOODLAWN HIGH SCHOOL</u>, 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 Bond Cost

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

5.2 Performance and Payment Bonds

5.2.1 Return of Agreement

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:

5.2.1.1 Performance Bond

A Performance Bond in the amount of one hundred percent (100%) of this Contract Price covering faithful performance of the Contract.

5.2.1.2 Payment Bond

A 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.

5.2.1.3 Powers Of Attorney

Powers Of Attorney, properly executed, shall accompany bonds.

5.2.2 Failure to Execute and Deliver Signed Contract

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 Name on Bonds

Performance bonds and payment bonds shall be made out in the name of the "<u>Board of Education of Baltimore County</u>, Attn: Contracting Assistant, 6901 Charles Street, Building "E", 1ST Floor, Towson, MD 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 N Charles Street, Building "E", 1st Floor Towson, MD 21204

5.2.4 Bond Cost

The cost of these bonds shall be included in the bid amount.

5.2.5 Warranty Period

It is imperative that the Bidder advise the bonding company that the Contract calls for a two (2) year contractor warranty period by the installing Bidder.

5.3 Certificates of Insurance

5.3.1 Name on Certificates and Changes in Insurance

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

5.3.1.1 Address/Location to Forward Certificate to

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

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

5.3.1.2 Named Insured

The Insurance Certificate must name the "Board of Education of Baltimore County" as the "additional insured"

5.3.1.3 Cancellation Notice

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 <u>thirty (30) days</u> in advance of the cancellation date notice to the certified holder."

NOTE: ALL other wording shall be deleted.

5.3.2 Failure to Execute and Deliver Contract and Certificate of Insurance

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 Insurance Cost

Cost of Insurance shall be included in the bid amount.

5.3.4 Insurance Coverage

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 CERTIFIED MINORITY BUSINESS ENTERPRISES

Minority Businesses Encouraged 6.1

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

6.1.1 Goal(s)

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 10 percent of the total contract value is with certified Minority Business Enterprises There are NO SUB GOALS established for this project, 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 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 sub goals, if any, established for the contract, provided that the certified MBE prime contractor is:

6.1.2.1 Self-Performing

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

6.1.2.2 Certification COMAR 21.11.03.12-1

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.

6.2 Submission

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

6.2.1 Attachment A and Attachment B – With Proposal/Bid

"Attachment A: CERTIFIED MINORITY BUSINESS ENTERPRISE -UTILIZATION AND FAIR SOLICITATION AFFIDAVIT" and "Attachment B: MINORITY BUSINESS ENTERPRISE PARTICIPATION SCHEDULE" shall be submitted with the sealed proposals/bid at the place, date and time specified in the solicitation document(s).

6.2.2 Alternate

As an alternative, and at the discretion of the school system, Attachment A could be submitted <u>with</u> 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, <u>in a</u> <u>separate sealed envelope</u>. The sealed price envelopes from each bidder or offeror who submits either 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 <u>will not be opened or considered</u>.

6.3 Recognition of Commitment

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.

6.3.1 Review of Efforts

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 <u>prior to and up to 10 days</u> 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.

6.3.2 Determining Good Faith Effort

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.

6.4 MBE Participation

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:

6.4.1 Requesting a "Waiver"

They are therefore requesting a waiver, and

6.4.2 Documenting a "Good Faith Effort"

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.

6.5 Attachment B Submission

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 <u>completed and accurate</u> 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.

6.6 Revised Attachment B Submission

Attachment B should be completed and submitted with all calculations utilizing the <u>base bid</u> <u>or offer only</u>. 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.

6.7 Request for Waiver

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.

6.8 Contract Documentation

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:

6.8.1 Attachment D

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.

6.8.2 Notification

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.

6.8.3 Time Parameters for Notification

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.

6.8.4 Review of Documentation

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.

6.9 MBE Contract Performance

6.9.1 Performance in Accords with Representations

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.

6.9.2 Failure Without Consent

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.

6.9.2.1 Operational Structure

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.

6.9.2.2 Best Effort(s) Agreement

The contractor agrees to use his/her best efforts to carry out these requirements consistent with the efficient and effective performance of the contract.

6.9.2.3 Ensuring maximum Opportunity

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.

6.9.2.4 Monthly Reporting

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.

6.9.2.5 Sub-Contractor Reporting

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.

6.9.2.6 Procedures Review

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.

6.9.2.7 Record Confirming Compliance

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.

6.9.2.8 Records Retention

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.

6.9.2.9 Final Report

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.

6.9.2.10 MBE Becoming Unavailable

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.

6.9.2.11 Minority Business Participant

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.

6.9.2.12 Additional MBE Participation

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.

6.9.2.13 Requisition for Payment

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.

6.9.2.14 Written Summary at Completion

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.

6.9.2.15 Good Faith Effort

This contract requires the contractor to make good faith efforts to comply with the Minority Business Enterprise ("MBE") Program and contract provisions. The Baltimore County Public Schools ("BCPS") and the Contractor acknowledge and agree that BCPS will incur damages, including but not limited to loss of goodwill, detrimental impact on economic development, and diversion of internal staff resources, if the Contractor does not make good faith efforts to comply with the requirement of the MBE Program and MBE contract provisions. The parties further acknowledge and agree that the damages which BCPS might reasonably be anticipated to accrue as a result of such lack of compliance are difficult to ascertain with precision.

6.9.2.16 Failure to Make Good Faith Effort

Therefore, upon and determination by BCPS that the Contractor failed to make good faith efforts to comply with one or more of the specified MBE Program requirements or contract provisions, the Contractor agrees to pay liquidated damages to BCPS at the rates set forth below. The Contractor expressly agrees that BCPS may withhold payment on any invoices as a set-off against liquidated damages owed. The Contractor further agrees that for each specified violation, the agreed upon liquidated damages are reasonably proximate to the loss that BCPS is anticipated to incur as a result of such violation

6.9.2.16.1 Failure to Submit Payment Reports

Failure to submit each monthly payment report in full compliance with COMAR 21.11.03.13B (3): \$35 per day until the monthly report is submitted as required.

6.9.2.16.2 Requirement for Payment Reports

Failure to include in its agreements with MBE subcontractors a provision requiring submission of payment reports in full compliance with COMAR 21.11.03.13B (4): \$95 per day per MBE subcontractor.

6.9.2.16.3 Non-Compliant Termination

Failure to comply with COMAR 21.11.03.12 in terminating, canceling, or changing the scope of work/value of a contract with an MBE subcontractor and/or amendment of the MBE participation schedule: the difference between the dollar value of the MBE participation commitment on the MBE participation schedule of the specific MBE firm and the dollar value of the work performed by that MBE firm for the contract.

6.9.2.16.4 Failure to Pay Promptly

Failure to promptly pay all undisputed amounts to an MBE subcontractor in full compliance with the prompt payment provisions of the contract: \$100 per day until the undisputed amount due to the MBE subcontractor is paid. [DO NOT INCLUDE IN CONTRACTS THAT ARE SUBJECT TO SECTION 15-226 OF THE STATE FINANCE AND PROCUREMENT ARTICLE - CONSTRUCTION CONTRACTS - PROMPT PAYMENT OF SUBCONTRACTORS].

6.9.2.17 BCPS Reserved Right

Notwithstanding the use of liquidated damages, BCPS reserves the right to terminate the contract and exercise all other rights and remedies provided in the contract or by law.

6.10 Prohibition

Except as otherwise provided by law, a contractor may not identify a certified minority business enterprise in a bid or proposal and:

6.10.1 Failure to Receive Authorization

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;

6.10.2 Failure to Notify

Fail to notify the certified minority business enterprise before execution of the contract of its inclusion of the bid or proposal;

6.10.3 Failure to Use

Fail to use the certified minority business enterprise in the performance of the contract; or

6.10.4 Pay for Name Only

Pay the certified minority business enterprise solely for the use of its name in the bid or proposal.

7 ADDENDA AND/OR EXPLANATION OF BID DOCUMENTS

7.1 Changes

All changes to the bid specifications will be made through the appropriate addenda. Any and all such interpretations and any supplemental instructions will be available to all bidders who pick up a copy of the bid. Addenda will be issued at least five (5) business days prior to the date fixed for the opening of bids, unless the addendum issued extends the due date of the bid.

7.2 Verification of Receipt of Agenda

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 BID ALTERNATES

8.1 Alternate Pricing

Bidders shall Include prices for all bid Alternates as herein.

8.2 Bidder-Originated Alternates

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 Receipt of Notice of Acceptance

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 METHOD OF BIDDING AND AWARD

9.1 Lump Sum

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 <u>in any order at the sole discretion</u> <u>of BCPS</u>.

9.2 Base Bid

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 Alternate(s)

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

9.4 Ability to Perform Work

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 Reserved Right

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 PROPOSAL/BID OPENING

10.1 Names and Prices

At the proposal/bid opening the bidders' names and their prices will be read and posted.

10.2 Announcement of Award

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 Proposal/Bid Review

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 INQUIRIES DURING BIDDING

11.1 When and How

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 be responded to in a timely fashion. The bid number must be referenced on all correspondence.

All written inquiries must be forwarded to or copied to the Purchasing Agent [Melvin E. Burley].

11.2 Inquiries Regarding the Solicitation/Bid Document

ALL inquiries regarding the "SOLICITATION" and/or information contained in this bid shall be **<u>IN WRITING</u>** to Melvin E. Burley, C.P.M., CPPO, CPPB. Inquiries shall be either faxed to (410) 887-7831 or e-mail to <u>mburley2@bcps.org</u> and <u>not called</u> into the office or left in the form of a telephone message.

11.3 Inquiries Regarding the Specifications/Requirements

Any inquiries regarding the "SPECIFICATIONS" in this solicitation/bid may be forwarded <u>IN</u> <u>WRITING</u> to Douglas Mullins, BCPS Office Physical Facilities, Engineering and Construction. Inquiries shall be either faxed to (410) 809-9090 or e-mailed to <u>pmullins@bcps.org</u> and <u>not called</u> into the office or left in the form of a telephone message.

All written inquiries must be forwarded to or copied to the Purchasing Agent [Melvin E. Burley].

11.4 Inquiries Regarding MBE Participation

Any inquiries regarding the "MBE PARTICIPATION" shall be directed to Melanie Webster at <u>mwebster@bcps.org</u> and/or to FAXED: (410) 887-4334.

All written inquiries must be forwarded to or copied to the Purchasing Agent [Melvin E. Burley].

12 PROPOSAL/BID SUBMISSION

12.1 Return Proposals/Bids to:

BALTIMORE COUNTY PUBLIC SCHOOLS OFFICE OF PURCHASING RE: MBU-500-17 ATTN: Melvin E. Burley, Purchasing Agent 6901 N Charles Street, Building "E" Towson, MD 21204

12.1.1 Marking Proposal/Bid

Bids must have the Bid Due Date and Time, Bidder's Name, 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 Bid Delivery

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 Documentation to Return with Proposal/Bid

The following shall be submitted in a sealed envelope at the location, date, and time specified in the solicitation document:

12.2.1 Price Proposal(s)/Certifications, Affidavits & Representations

Section 00400: Form of Proposal, Price Proposal and Certifications, Affidavits & Representations; pages 1 of 20 to 20 of 20. Complete, sign and return with bid. [Also included in "form of proposal" – insert pages]

- 12.2.1.1 Price Proposal / Bidder Agreement page
- 12.2.1.2 Cost Base Bid, Alternate & Unit Prices [where applicable]
- 12.2.1.3 Alternates
- 12.2.1.4 Unit Prices
- 12.2.1.5 Warranty of Lump Sum

12.2.2 Acknowledgement of Addenda

Section 00400: Form of Proposal, Section 3; page 10 of 20. 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. [Also included in "form of proposal" pages]

12.2.3 Proposal Sheet

Section 00400: Form of Proposal, Section 4; page 11 of 20. Complete, sign and return with bid. [Also included in "form of proposal" pages]

12.2.4 State of Maryland Anti-Bribery Affidavit

Section 00400: Form of Proposal, Section 5; page 12 of 20. 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. [Also included in "form of proposal" pages]

12.2.5 State of Maryland Tax Certification

Section 00400: Form of Proposal, Section 6; page 13 of 20. 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. [Also included in "form of proposal" pages]

12.2.6 Certification Regarding U.S. Government Debarment, Suspension, Ineligibility, and Voluntary Exclusion

Section 00400: Form of Proposal, Section 7; page 14 of 20. 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. [Also included in "form of proposal" pages]

12.2.7 References

Section 00400: Form of Proposal, Section 8; page 15 of 20. Complete, sign and return with bid. [Also included in "form of proposal" pages]

12.2.8 Board of Directors - Diversity Affidavit

Section 00400: Form of Proposal, Section 9; page 16 of 20. Complete, sign and return with bid. [Also included in "form of proposal" pages]

12.2.9 Attachment A: Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit pages 1 & 2

Section 00400: Form of Proposal; page 17 &18 of 20 Complete, sign and return with bid. [Also included in "form of proposal" pages]

12.2.10 Attachment B: MBE Participation Schedule

Section 00400: Form of Proposal; 19 of 20 The Attachment B shall be completed, signed and returned with bid. [Also included in "form of proposal" pages]

12.2.11 No Bid Sheet

Section 00400: Form of Proposal, Section 10; page 20 of 20. This page should be returned if you are not participating in the bid. [Also included in "form of proposal" pages]

12.2.12 Pre-Qualifications Certificate

A copy of the bidder's pre-qualification certificate shall be included with their proposal.

12.2.13 Bond(s)

Bid Bond, provide as specified.

12.2.14 All Other Documentation

All other information and/or forms and/or affidavits specified in this Solicitation and/or Addenda issued.

12.3 Copies to Submit

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 Improper or Incomplete Proposals/Bids

Proposal submitted improperly and/or incomplete may be deemed non responsive.

12.5 Late Proposals / Bids

Proposals received after the published due date/due time will be rejected as non-responsive.

13 BIDDER INFORMATION – - REQUIRED

13.1 Vendor Self -Service

ALL Bidders are advised that the BCPS has a "Vendor Self-Service" (VSS) system. To register with BCPS follow the instructions below:

- 13.1.1 Type the following into your browser: <u>http://www.bcps.org/offices/purchasing/</u>
- 13.1.2 In the middle of the Office of Purchasing web-page, 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 Required Information

By entering the required information into the VSS site, you are taking the first step towards 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.

13.3 Bid Board

Go to our website at <u>www.bcps.org</u> and **Click** onto" Offices"; **Click** onto "Purchasing Office"; **Click** onto "Bid Board"; **Click** onto "Invitation to Bid".

14 PERFORMANCE APPRAISAL

14.1 Project Evaluation

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 Web-Based

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 <u>www.ratingsource.com</u>. 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 Projects Not Evaluated

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 Participation Instructions

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 002000 - 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;
 - 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 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. Work shall be completed in accordance with the construction phasing specified completion dates. Major cleaning (Section 01740) is required by August 1, 2018 and shall be coordinated with the scheduled arrival of school furnishings and the school's Chief Custodian.

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 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 Occupied Areas During School Session:
 - 9.1.1 Any work which must occur in the existing occupied building must be scheduled and coordinated in advance with the BCPS Project Manager. 48 hour notice is required.
 - 9.1.2 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.
 - 9.1.3 FIRE DRILLS: During the year the school is required to stage several fire drills. These drills are scheduled events which date and time will be conveyed to the general contractor in advance by the Owner's construction project manager.
 - 9.1.11 LOCKDOWNS: During the school year there may be a lockdown of the facility due to a security issue which will be determined by BCPS Security Department. During a lockdown event the following will occur:
 - A. The general contractor's representative will be alerted to the event or situation and will be responsible to manage the construction area to ensure the safety of his sub-contractors and employees and to avoid any impact to the school's operation. All employees must remain in the building, not exiting or entering the building and MUST secure any and all doors for which the contractors use to enter or exit the building."

- B. If an employee of the contracting companies happen to be doing work in an area occupied by students, they would remain in the LOCKDOWN areas with the students until an all clear signal is announced.
- 9.2 INTERRUPTIONS OF EXISTING BUILDING SYSTEMS
 - 9.2.1 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 CONTRACTOR CONSTRUCTION SCHEDULE

- 9.3.1 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.
- 9.3.2 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:
 - 9.3.2.1 The Contractor will be notified that they have fourteen (14) calendar days to expedite their work to get back on schedule.
 - 9.3.2.2 BCPS will not make any further payments until the Contractor is back on schedule.
- 9.3.3 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.

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 1 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 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 <u>without</u> 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 <u>after notice of award and receipt of contract</u>. Prices will be provided to the Interagency Committee on School Construction of the State of Maryland. <u>These</u> <u>prices will not affect the award of the project or the Notice to Proceed (NTP)</u>. Information to be provided in a letter to the BCPS Project Manager.
 - 1. Teacher's Wardrobe
 - 2. Low Bookshelves, Mobile
 - 3. Metal Shelving
 - 4. Range
 - 5. Hood
 - 6. Under counter Refrigerator
 - 7. Refrigerator
 - 8. Dishwasher
 - 9. Food Transport Cart
 - 10. Shelving, Mobile
 - 11. Shelving
 - 12. Dunnage Rack, Mobile
 - 13. Shelving, Mobile
 - 14. Pot and Pan Shelving, Mobile
 - 15. Worktable
 - 16. Convection Oven
 - 17. Heated Transport Cabinet, Mobile
 - 18. Pan Rack Cart, Mobile
 - 19. Pass-Thru refrigerator, Mobile
 - 20. Pass-Thru warming cabinet, Mobile
 - 21. Ice Cream Cabinet, Mobile
 - 22. Milk Cooler, Mobile
 - 23. Cashier Stand
 - 24. Cash Register
 - 25. Condiment Counter, Mobile
 - 26. Utility Cart, Mobile
 - 27. Bulk Milk Cooler, Mobile
 - 28. Media Shelving, Mobile
 - 29. Display and Poster Cases
 - 30. Health Room Cubicle Curtains
 - 31. Platform Curtains and Tracks
 - 32. Safety Pads
 - 33. Horizontal Louver Blinds
 - 34. Window Shade Systems
- 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 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.
- 15.2 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.

19.0 HAZARDOUS MATERIAL ABATEMENT WORK

- 19.1 Hazardous material abatement work related to the Lansdowne Elementary School project is included in this Contract. The General Contractor will in all respects be totally responsible for the hazardous material abatement work by his Subcontractor and shall coordinate this work with the other disciplines. This work is subject to inspection and approval of the BCPS authorized representative. The Contractor is required to contact BCPS at 443-809-6301 to review the procedures for containing hazardous materials prior to the start of any work in or interfacing with the existing facility.
- 19.2 The Bidder shall handle and dispose of hazardous materials in accordance with all Federal, State, and Local regulatory requirements, guidelines, and standards, as well as in accordance with these specifications. Polychlorinated Biphenyls PCBs, fluorescent light bulbs, lead-based paints and lead-containing surfaces/materials, and asbestos-containing materials shall be handled in accordance with the Specifications For Hazardous Materials Abatement. Mercury containing switches shall be identified by the Contractor and properly handled and disposed as hazardous waste. All other hazardous materials shall be handled in accordance with applicable regulatory and industry standards. Hazardous materials may consist of waste products generated by the renovation scope of work. The Bidder is responsible for determining all wastes and byproducts and arranging proper handling and disposal procedures. All handling and disposal costs are the responsibility of the Bidder.
- 19.3 Abatement shall only take place during weekends and holidays; Christmas, Spring, and Summer Breaks. Additionally, abatement may only take place at times that the school is unoccupied by students and the general public. For weekend work, abatement set-up can generally be scheduled beginning at 4:00 PM on Fridays. During other holidays and breaks, abatement set-up work may begin once the school is vacant of students and the public. To facilitate scheduling abatement around the school's activity schedule, the Contractor is responsible for giving at least two weeks advanced notice to the BCPS project representative and the school.

20.0 HAZARDOUS MATERIALS FAMILIARITY TRAINING

20.1 The Bidder is responsible for HazMat Familiarity Training for all contractor and subcontractor personnel. Refer to the Specifications For Hazardous Materials Abatement for further description of HazMat Familiarity Training.

21.0 HAZARDOUS MATERIAL ABATEMENT MONITORING

- 21.1 BCPS will hire and pay the Industrial Hygienist, for all air monitoring, testing and project monitoring. The selection of the Industrial Hygienist will be done by BCPS and the selected firm will be utilized for the duration of the project. The Industrial Hygienist must be on site to provide project oversight the entire time the abatement contractor is working. The award bidder shall be solely responsible for scheduling of the Industrial Hygienist with all Abatement work.
- 21.2 All payments to the industrial hygienist will be the responsibility of BCPS except costs as indicated below in 21.3.
- 21.3 Payment for any and all Industrial Hygienist costs associated with re-cleaning of areas that fail final clearances are the responsibility of the contractor.
- 21.4 In the event of unsuitable air tests, BCPS, Office of Environmental Services (David Glassman) cell phone (443)-829-8623 and the BCPS Project Manager must be notified immediately.

22.0 AIR AND WATER BALANCING

22.1 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.

23.0 CONSTRUCTION PHASE MATERIALS TESTING

- 23.1 The Owner shall engage 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 shall coordinate construction activities with the testing company hired by the Owner.
- 23.2 Refer to paragraph 21.0 for Hazardous Materials Abatement Monitoring
- 23.3 Contractor shall be responsible for all other various inspections and required testing including but not limited to commissioning, testing and balancing, etc.
- 23.4 Copies of testing and inspection reports will be provided to the Contractor by the testing agency as per prior agreed time and schedule by the Contractor and testing 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.

24.0 SEDIMENT CONTROL

24.1 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.

25.0 WELDING, CUTTING AND HEATING OPERATIONS

- 25.1 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.
- 25.2 BCPS may at any time during the project request the contractor(s) to provide documentation indicating compliance with the stated regulations and standards.

26.0 BUY AMERICAN STEEL ACT

- 26.1 Consistent with the provisions of the Maryland State Finance and Procurement Article of the <u>Annotated Code of Maryland</u>, Sections 17 - 301 through 17 - 306, inclusive, known as the "Buy American Steel Act."
- 26.2 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.
- 26.3 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.
- 26.4 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.
- 26.5 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.
- 26.6 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."

27.0 WARRANTY

- 27.1 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 <u>TWO (2) YEAR</u> 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.
- 27.2 All warranty work shall be accomplished to the satisfaction of the owner within <u>SEVENTY</u> <u>TWO (72) HOURS</u> of notification of the work to be done.

28.0 CONSTRUCTION SIGN

28.1 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

28.2 There shall be <u>no</u> 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

Lansdowne Elementary School **New Construction** PSCP #03.105.17 Bid Number- MBU-516-17



APPENDIX E CONSTRUCTION SIGN FOR STATE FUNDED 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 *the* Lansdowne Elementary School

E-1A

29.0 SCHOOL CALENDARS

- 29.1 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. Eid al-Adha
 - j. Rosh Hashanah
 - k. Yom Kippur
 - I. Thanksgiving
 - m. Christmas Eve
 - n. Christmas Day
 - o. New Year's Eve
 - p. Election Day(s) WORK SHALL NOT BE SCHEDULED ON THESE DAYS
- 29.2 The current school calendars for the 2015 2016 and 2016 2017 academic years are found on the following pages. Please note these calendars are subject to change by the Board of Education.
- 29.3 Ending or extension date of the school term may occur depending on the number of emergency closing days required during the school calendar year.
- 29.4 For updated information, please visit: <u>https://www.bcps.org/calendars</u>

2015-2016 School Year

Approved: 06/10/14

Friday	14	Administrative & Supervisory Personnel Meeting
Monday	17	Teachers on Duty
Tuesday- Wednesday	18- 19	System-wide Professional Development Activities
Wednesday	19	School based Para-educators and Ten (10) Month Clericals on Duty
Wednesday	24	Opening Day for Students

September

August

Monday	7	Labor Day – Schools and Offices Closed
Monday	14	Rosh Hashanah – Schools and Offices Closed

Wednesday	23	Yom Kippur – Schools and Offices Closed
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October		
Monday	12	Columbus Day*
Friday	16	System-wide Professional Development Day/MSEA Convention – Schools Closed for Students – Teachers on Duty
Friday	30	First Marking Period Ends – Schools Close 3 Hours Early for Elementary and Middle School Students – Grade Reporting and Data Analysis ^{**} – Teachers on Duty – High Schools in Session Full Day

November

Wednesday	11	Veterans Day*
Thursday	12	Distributions of Report Cards – Preschool-3 and Pre-K Conference Day – No Preschool-3 or Pre-K A.M. or P.M. Sessions – Teachers on Duty
Friday	13	Elementary Conference Day – Schools Closed for Elementary Students – Teachers on Duty – Middle Schools and High Schools in Session Full Day
Monday- Friday	16- 20	American Education Week
Thursday- Friday	26- 27	Thanksgiving Holiday – Schools and Offices Closed

December

Friday	11	Half-Day System-wide Professional Development – All Schools Close 3 Hours Early – Teachers on Duty
Tuesday	15	Bill of Rights Day*
Wednesday	23	Christmas Holiday/Winter Break Begins at the End of School Day

January

Monday	4	Schools Reopen
Friday	15	Dr. Martin Luther King, Jr.'s, Birthday *
Friday	15	Second Marking Period Ends – All Schools Close 3 Hours Early – Grade Reporting and Data Analysis ^{**} – Teachers on Duty
Monday	18	Dr. Martin Luther King, Jr.'s, Birthday Observed – Schools and Offices Closed
Tuesday	19	Schools Closed for Students – System-wide Professional Development – Teachers on Duty (Full Day Preparation for Teachers with Semester Courses)
February		
Thursday	4	Distribution of Report Cards

Monday	15	Presidents' Day – Schools and Offices Closed
Monday	22	Washington's Birthday*
March		
Friday	4	Half-Day System-wide Professional Development for Elementary and Middle Schools – Schools Close 3 hours early for Elementary and Middle School Students – Teachers on Duty – High Schools in Session Full Day
Thursday	24	Easter Holiday/Spring Break Begins at the End of School Day
Friday	25	Maryland Day*
April		
Monday	4	Schools Reopen
Thursday	7	Third Marking Period Ends
Friday	8	Schools Close 3 Hours Early for Elementary and Middle School Students – Grade Reporting and Data Analysis** – Teachers on Duty – High Schools in Session Full Day
Thursday	21	Distribution of Report Cards
May		
Monday	16	Pre-K and Kindergarten Conference Day – No Preschool-3, Pre-K, or Kindergarten Sessions
Friday	27	Last Day for Seniors
Monday	30	Memorial Day Observed – Schools and Offices Closed
Tuesday	31	Commencement Exercises Begin
June		
Wednesday- Thursday	1-9	Commencement Exercises
Tuesday	14	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
Wednesday	15	Assessment Day**** – Schools Close 3 Hours Early for Elementary and Middle School Students – High Schools in Session Full Day – Grade Reporting and Data Analysis** – Teachers on Duty
Thursday	16	Assessment Day**** – Schools Close 3 Hours Early for Elementary and Middle School Students – High Schools in Session Full Day – Grade Reporting and Data Analysis** – Teachers on Duty
Thursday	16	Flag Day*
Friday	24	Summer School Teachers on Duty (Teachers choose June 24 or July 1)

Lansdowne Elementary School New Construction PSCP #03.105.17 Bid Number- MBU-516-17

July		
Friday	1	Summer School Teachers on Duty (Teachers choose June 24 or July 1)
Monday	4	Independence Day – Schools and Offices Closed
Tuesday	5	Summer School Begins
Friday	2	9 Summer School Ends
		2016-2017 School Year
. .		Approved: 11/13/15
August	10	Administrative & Supervisory December Meeting
Fliday	12	Administrative & Supervisory Personner Meeting
Thursday	17	Preschers on Duty
Madaaadaa	10	Systemwide Professional Development Activities
weanesday	24	Opening Day for Students
September		
Monday	5	Labor Day – Schools and Offices Closed
Sunday	11	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
Thursday	27	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
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	System-wide Professional Development Day, 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 Friday	25 31	Maryland Day* 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
April		
Friday	7	Easter Holiday/Spring Break begins at the end of the day
Tuesday	18	Schools Reopen
Thursday	20	Distribution of Report Cards
Мау		
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 School Schools Close 3 Hours Early for Students – Grade Reporting and Data Analysis** – Teachers on Duty; High Schools in Session Full Day

Lansdowne Elementary School New Construction PSCP #03.105.17 Bid Number- MBU-516-17

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

July

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

END OF SECTION 002000

PAGE

BALTIMORE COUNTY PUBLIC SCHOOLS- OFFICE OF PURCHASING

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

SECTION 00400: FORM OF PROPOSAL

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SECTION

SECTION 00400 - FORM OF PROPOSAL

1 PRICE PROPOSAL / BIDDER AGREEMENT

DATE:	
PROJECT TITLE:	<u>NEW SCHOOL CONSTRUCTION –</u> LANDSDOWNE ELEMENTARY SCHOOL & DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL
BCPS BID NUMBER:	<u>MBU-516-17</u>
BID SUBMITTED BY:	
REGISTERED MARYLAND CO	NTRACTOR NO:
SUBMITTED TO:	Baltimore County Public Schools Office of Purchasing 6901 N Charles Street, Building "E", 1 ST 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)

2 COST

2.1 Base Bid

The TOTAL BASE BID for Contract Documents, consisting of the cost of hazardous material abatement, demolition, and new construction, including the related architectural, structural, mechanical, electrical, and other requirements incidental to the project, should be listed below.

All bidders shall **INCLUDE** an allowance in their BASE BID 1 PRICE of **\$12,000.00 for** Cafeteria Signage.

2.1.1 TOTAL BASE BID

Lump Sum Item for all work specified on plans and/or specifications consisting of the cost of demolition, and new construction, including the related architectural, structural, electrical, and other requirements incidental to the project, should be listed below.

PART A LUMP SUM ITEM: \$_		(IN DOLLARS)
---------------------------	--	--------------

PART A LUMP SUM ITEM:	(IN WRITING)
	· · · · · ·

Part B consisting of the total cost of the Unit Price Items (see page 6 of 20)

PART B UNIT PRICE ITEMS: \$	۶۲	(IN DOLLARS)
PART B UNIT PRICE ITEMS:		(IN WRITING)

Total for Base Bid: Sum of PART A and PART B

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)

2.2 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 1.0 General Scope & Services. 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.

Alternate No. 1 ADD:

Provide concrete benches at outdoor learning area as specified and detailed on drawings.

\$	(In Dollars)
	(In Writing)
(Signature of Bidder)	(Date)
Alternate No. 2 ADD: Provide fabric wrapped acoustical panels at gymnasium as spe on drawings.	cified and details
\$	_(In Dollars)
	(In Writing)
(Signature of Bidder)	(Date)
Alternate No. 3 ADD: Provide PV panels at green roof terrace and electronic dashboa solar panels as specified and detailed on drawings.	ard connected to
\$	(In Dollars)
	(In Writing)

	Solicitation Nu (Signature of Bidder)	mber MBU-5 ² (Date)
Alternate No. 4 ADD: Provide rain barrel with setting block	د and downspout diverter at drawings	green roof
\$	drawings.	(In Dollars
		(In Writing
Alternate No. 5 ADD:	(Signature of Bidder)	(Date
Provide rooftop equipment screens	as specified and detailed or	n drawings.
\$		_(In Dollars
		(In Writing
	(Signature of Bidder)	(Date
Alternate No. 6 ADD: Provide digital and masonry site sig	n as specified and detailed	on drawings.
\$		(In Dollars
		(In Writing
	(Signature of Bidder)	(Date
Alternate No. 7 ADD:		
Provide concrete sidewalk from pay specified and detailed on drawings	ed play to dead end at Zion	Road as
\$		(In Dollars
		(In Writing
	(Signature of Bidder)	(Date
Alternate No. 8 ADD:	/	``
Provide HDPE storm drain pipe as	specified and detailed on dr	awings.
\$		_(In Dollars
		(In Writing
	(Signature of Bidder)	(Date

Alternate No. 9 ADD:

Provide masonry piers with PVC coated chain link fencing infill at Kindergarten play area as specified and detailed on drawings.

\$		_(In Dollars)
		_(In Writing)
(Si	gnature of Bidder)	(Date)
Alternate No. 10 ADD: Provide quartz tile as specified and detailed	on drawings.	
\$		_(In Dollars)
		_(In Writing)

(Signature of Bidder)

2.3 Unit Price Schedule

Bidders shall determine and provide Unit Pricing in the spaces below based on the quantity listed for each allowance. <u>The Bidder's base bid shall include the allowance total for this Bid Package being bid.</u> Unit Prices include all costs associated with the work. Bidder shall insert Unit Price and Item Bid Price at each allowance identified with the Bidder's Bid Package number. Do not leave blank. The Bidder's Unit Prices established on the Bid Form will be used for adding work or establishing a credit for work not performed. Any unused allowance will be credited to the Owner via change order. Unit Prices are considered not to exceed unit prices and shall be used where applicable to adjust the cost of work of this Contract. ALL Unit Prices shall be complete in-place prices and include all costs for overhead, profit, all applicable Federal, State, Municipal or local taxes, bonds, labor, fringes, materials, equipment, insurance, and any other incidentals related to the completion of work and shall remain firm for the period of the contract. Unit Prices listed are applicable to added or delete items for the Unit Prices identified below as directed by the Owner. The Owner reserves the right to negotiate Unit Prices depending upon the quantities to which the Unit Prices become applicable. Unit Prices do not include any allowances required as referenced in specification section.

UNIT PRICE ITEMS TO BE INCLUDED IN BASE BID LUMP SUM PROPOSAL

No.	Unit Price Item	Unit	Quantity	Unit Price	Total Price
1	Furnish and install new curb	Linear Feet	300		
	and gutter				
2	Furnish and install new	Square Feet	2,000		
	concrete sidewalk				
3	Furnish and install Soil	Square Yard	5,000		
	cement, 5% by weight, 12				
	inches deep				
<u>4</u>	Provide a concrete moisture	Square Feet	97,000		
	mitigation system for all				
	concrete slab on grade and				
	concrete slab on deck				

Total for PART B: Sum of total prices No. 1 + 2 + 3 + 4 above:

Total for PART B: Sum of total prices No. 1 + 2 + 3 + 4 above:

<u>\$</u>(In Writing)

(Signature of Bidder)

(Date)

Creating A Culture of Deliberate Excellence An Affirmative Action Employer

2.4 Unit Prices

Unit prices are for both extra Work and credits. This list of unit 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.	Riprap Class 1 -	\$50.00 per Ton
2.	Earth Excavation Onsite (machine)	\$3.00 per cubic yard
3.	Earth Excavation Offsite (machine)	\$16.00 per cubic yard
4.	Earth Excavation Onsite (hand)	\$90.00 per cubic yard
5.	Earth Excavation Offsite (hand)	\$100.00 per cubic yard
6.	Trench Excavation Onsite	\$9.00 per cubic yard
7.	Trench Excavation Offsite	\$20.00 per cubic yard
8.	Contaminated Soil (excavate, legally dispose)	\$245.00 per cubic yard
9.	MSHA #2 or #57 stone at trench areas	\$37.40 per cubic yard
10.	CR-6 or CR-1 at trench areas	\$41.80 per cubic yard
11.	MSHA #2 or #57 stone in open areas	\$45.00 per cubic yard
12.	CR-6 or CR-1 in open areas	\$54.00 per cubic yard
13.	Imported Screened Topsoil	\$30.00 per cubic yard
14.	Sodding	\$4.25 per square yard
15.	Permanent Seeding and Mulch	\$0.70 per square yard
16.	Temporary Seeding and Straw	\$0.35 per square yard
17.	Mirafi 500x (furnish and install)	\$1.30 per square yard
18.	Stabilization Fabric (furnish and install)	\$1.60 per square yard
19.	Stabilization Fabric and Filter Cloth (furnish and install)	\$32.00 per square yard
20.	MSHA #2 Stone	\$20.90 per ton
21.	Super Silt Fence (furnish, install, maintain, remove)	\$12.00 per linear foot
22.	Silt Fence (furnish, install, maintain, remove)	\$4.50 per linear foot
23.	Leafgro (furnish and install)	\$30.00 per cubic yard
24.	Soil Cement (furnish and install)	\$8.75 per square yard
25.	Hydrated Lime (furnish and install)	\$8.25 per square yard
26.	Erosion Control Matting (furnish and install)	\$2.00 per square yard
27.	A-2 Type dike and incidentals (install and remove)	\$5.45 per linear foot
28.	I rench Rock (remove, haul, legally dispose)	\$150.00 per cubic yard
29.	Open Rock (remove, haul, legally dispose)	\$75.00 per cubic yard
30.	Existing sidewalk and spoil (remove, legally dispose, repla	ace)
04	Evisting Outh and Outton (new out langth, dispass, and	\$8.50 per square foot
31.	Existing Curb and Gutter (saw cut, legally dispose, replace	e) ¢22.00 nor linear fact
22	CD 6 #2 stops or #57 stops (import sompost)	\$23.00 per linear loot
ა∠. ეე	CR-6 #2 stone of #57 stone (import, compact)	\$23.00 per ion
აა. ე⊿	Saw-cut and remove damaged paving	\$40.00 per square yard
34. 25	Concrete Curb and guiler	\$14.18 per inear loot
აე. ან		\$0.60 per square foot
30. 27	6" CML woll	\$10.34 per square foot
37. 20		\$10.77 per square foot
30. 20		\$11.20 per square foot
39. 40	Tooth single doorframe (furnish and install)	\$800.00 per square 1001
40. 11	Tooth double doorframe (furnish and install)	
41. 12	Recentacle	\$536.00 per opening
42. 12	Fire Alarm Strobe	\$380.00 per location
40.		ψ_{000} , ψ_{00} ψ_{00}

44. Fire Alarm Horn or Speaker/Strobe Unit

- 45. Data Outlet
- 46. Exit Sign
- 47. Light Switch
- 48. Telephone Drop
- 49. Video Drop
- 50. Speaker
- 51. Fire Alarm Pull Station
- 52. Concrete Sidewalk
- 53. Light Duty Bituminous Paving
- 54. Heavy Duty Bituminous Paving
- 55. Aggregate Piers
- 56. Imported fill material
- 57. Removal of unsuitable material
- 58. Reinforced concrete footing
- 59. Moisture Mitigation System

Solicitation Number MBU-516-17 \$464.00 per location \$255.00 per location \$418.00 each \$275.00 each \$236.00 each \$120.00 each \$943.00 each \$389.00 each \$7.00 per square foot \$29.00 per square yard \$42.00 per square vard \$52.00 per linear foot \$37.00 per cubic yard \$26.00 per cubic yard \$475.00 per cubic yard \$4.00 per square foot

2.5 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 Section 00200 of the Instructions to Bidders. The Owner may retain the sums as stated in "Liquidated Damages for Failure to Complete on Time," of Section 00200 instruction to Bidders.

2.6 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 Enterprises Utilization and Fair Solicitation Affidavit" and "Attachment B: MBE Participation Schedule" may result in the bid being determined non-responsive.

2.7 Bid Bond

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

2.8 Pre-Qualifications Certificate

Bidders must include a copy of their Pre-Qualifications Certificate as issued by the BCDPW

2.9 Addenda

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

2.10 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)

2.11 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)

Ву_____

(Official title)

(Business Address)

Contractor's Maryland Registration Number)

(Phone)

BALTIMORE COUNTY PUBLIC SCHOOLS

DIVISION OF BUSINESS SERVICES 6901 CHARLES STREET, BUILDING E TOWSON, MARYLAND 21204 DEPARTMENT OF FISCAL SERVICES

OFFICE OF PURCHASING TELEPHONE: (410) 887-4334 FAX: (410) 887-7831

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL & DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

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 Received _____

Addendum #2 - Date Received _____

Addendum #3 - Date Received _____

Addendum #4 - Date Received _____

Signature

Title

Vendor Name

_TIMORE COUNTY PUBLIC SCHO DIVISION OF BUSINESS SERVICES

DEPARTMENT OF FISCAL SERVICES

6901 CHARLES STREET, BUILDING E **TOWSON, MARYLAND 21204**

PROPOSAL SHEET

4

OFFICE OF PURCHASING TELEPHONE: (410) 887-4334 FAX: (410) 887-7831

Yes ____

Yes

No

No

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

- certify that to the best of my/our knowledge, that neither this firm, nor any of its officers, directors to partners nor any I/We 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).
- certify that this bid is made without any previous understanding, agreement, or connection with any person, firm or I/We 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.
- certify that all material and equipment bid by this firm, to be supplied to the Baltimore County Public Schools meets I/We 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.
- certify that all materials delivered to, and/or used or brought on to BCPS property is accompanied by a I/We manufacturer's certification verifying/confirming item(s) to be "asbestos free."
- certify that this firm adheres to or follows non-discriminatory practices with respect to the employment or promotion I/We of personnel without regard to color, creed, race, sex, or national origin.
- propose to furnish, package, mark, and deliver to the Baltimore County Public Schools, the supplies, materials or I/We equipment as required in the accompanying specifications at the unit prices indicated.
- certify that this firm is aware of and adheres to Section 11-722(c) of the Criminal Procedure Article, of the I/We Annotated Code of Marvland

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

Please indicate which group qualifies the business as a Minority Business Enterprise; (circle all that apply) (African American) (Asian) (Women) (Hispanic) (American Indian) (Alaskan Native) (Physical or Mental Disabled Individual)

Is your company a small business with less than fifty-employees (50), that generates annual revenue less than seven (7) million dollars?

Is your business located within Baltimore County, Maryland?

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 Part I: Terms and Conditions and Part II: Specifications-General Requirements, forming a part of the agreement and agree to furnish all permits, inspections, labor, equipment, and materials to complete work as specified for the price indicated, in the manner provided within these specifications, and especially on subsequent pages of this Proposal Sheet, for the Baltimore County Public Schools.

COMPANY		FEDERAL ID#			
ADDRESS (street)			(city, state)		(zip code)
TYPED NAME/TIT	LE				
SIGNATURE					
TELEPHONE		FAX		DATE	
E- MAIL					
RETURN BID TO	Office of Purchasing 6901 Charles Street, Building E Towson, MD 21204 Include Solicitation Number	E			
e of Deliberate Excell	ence			P	age 11 of 20

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BALTIMORE COUNTY PUBLIC SCHOOLS

DIVISION OF BUSINESS SERVICES 6901 CHARLES STREET, BUILDING E TOWSON, MARYLAND 21204

DEPARTMENT OF FISCAL SERVICES

OFFICE OF PURCHASING TELEPHONE: (410) 887-4334 FAX: (410) 887-7831

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSWDOWNE ELEMENTARY SCHOOL

I HEREBY CERTIFY that

1. I am the ______and the duly authorized representative of the firm of

whose 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 <u>Annotated code of Maryland</u> 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 <u>Annotated Code of Maryland</u>. 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 <u>Annotated Code of Maryland</u>, 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

Creating A Culture of Deliberate Excellence An Affirmative Action Employer Date

6 STATE OF MARYLAND TAX CERTIFICATION

BALTIMORE COUNTY PUBLIC SCHOOLS

DIVISION OF BUSINESS SERVICES 6901 CHARLES STREET, BUILDING E TOWSON, MARYLAND 21204 DEPARTMENT OF FISCAL SERVICES

OFFICE OF PURCHASING TELEPHONE: (410) 887-4334 FAX: (410) 887-7831

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

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 <u>Annotated Code of Maryland</u>. 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.

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

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

BALTIMORE COUNTY PUBLIC SCHOOL

DIVISION OF BUSINESS SERVICES 6901 CHARLES STREET, BUILDING E TOWSON, MARYLAND 21204 DEPARTMENT OF FISCAL SERVICES

OFFICE OF PURCHASING TELEPHONE: (410) 887-4334 FAX: (410) 887-7831

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

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.

8 **REFERENCES**

BALTIMORE COUNTY PUBLIC SCHOOLS

DIVISION OF BUSINESS SERVICES 6901 CHARLES STREET, BUILDING E TOWSON, MARYLAND 21204 DEPARTMENT OF FISCAL SERVICES

OFFICE OF PURCHASING TELEPHONE: (410) 887-4334 FAX: (410) 887-7831

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

YOU MUST COMPLETE AND RETURN THIS FORM WITH YOUR BID

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. Make additional copies of this page if necessary.

PROJECT #1		Date Project Completed		
Organization's/Company's Name	for Public Project [indicate p	roject/contract number]		
Brief Project Description and Bid/S	Solicitation Number			
Representative's Name F) Representative's Phone #	() Representative's Fax #	Email Address	
PROJECT #2		Date Project Completed	l	
Organization's/Company's Name	for Public Project [indicate p	roject/contract number]		
Brief Project Description and Bid/S	Solicitation Number			
(Representative's Name F) Representative's Phone #	() Representative's Fax #	Email Address	
PROJECT #3		Date Project Completed	i	
Organization's/Company's Name	for Public Project [indicate p	roject/contract number]		
Brief Project Description and Bid/S	Solicitation Number			
Representative's Name F Creating A Culture of Deliberate Excel An Affirmative Action Employer) Representative's Phone # lence	() Representative's Fax #	Email Address Page 15 of 20	
9 BOARD OF DIRECTORS - DIVERSITY AFFIDAVIT

BALTIMORE COUNTY PUBLIC SCHOOLS

DIVISION OF BUSINESS SERVICES 6901 CHARLES STREET, BUILDING E TOWSON, MARYLAND 21204

DEPARTMENT OF FISCAL SERVICES

OFFICE OF PURCHASING TELEPHONE: (410) 887-4334 FAX: (410) 887-7831

NEW SCHOOL CONSTRUCTION – LANSDOWNE ELEMENTARY SCHOOL DEMOLITION OF LANSDOWNE ELEMENTARY SCHOOL

This documentation is required by the statutory regulation, Bids/proposals, §5-112, Annotated Code of Maryland. Education enacted July 1, 2000. All bidders interested in submitting proposals on school construction projects shall provide information that identifies the diversity of its Board of Directors. Said diversity shall be identified by completion of this form. Failure to provide said documentation may be cause for rejection of the bidder's proposal as non-responsive.

Name of Corporation/Business

BCPS Bid No.

List of Board of Directors

|--|

(1) African Americans; (2) Alaskan Native; (3) American Indian/Native Americans; (4) Asians;
(5) Hispanics; (6) Physically or Mentally Disabled individuals; (7) Women; or (8) A non-profit entity organized to promote the interests of physically or mentally disabled individuals; (9) Caucasian. [Note: It is understood that an Individual may qualify for more than one designation.] Multiple designations shall be so noted on the form.] Internal Distribution: Internal Distribution: Copy with the Bidder's Proposal; Copy to BCPS-MBE Officer

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.

*	*	*	*	*	*	*	*	*	*	*	*	*
						Par	t I.					

I acknowledge the:

- Overall certified MBE subcontract participation goal of <u>29%</u> and
- The subgoals, if applicable, of:
 - <u>**7%</u>** for certified African American-owned businesses and</u>
 - $\underline{4\%}$ 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

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.
- 3 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)

4 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

Address

Affiant Signature

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 Public Schools	6. Base Bid Amount:
PSC No	\$
7a. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number	Minority Group Type
Minority Firm Fax Number	(Asian) (Hispanic) (Asian) (Hispanic)
MDOT Certification Number	
Work to be Performed and Subcontract Dollar Amount	Percent of Total Contract
7b. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number	Minority Group Type
Minority Firm Fax Number	
MDOT Certification Number	☐ (American Indian) ☐ (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 Group Type
Minority Firm Fax Number	(Air(can American))
MDOT Certification Number	(American Indian) (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:	11. Reviewed and Accepted by Board of Education MBE Liaison
Name:	Name:
- T24	Title:
	Date:
Date:	
Total MBE Participation:	% \$
Total Atrican-American MBE Participation:	~~ \$ % \$
Total Other Participation:	% \$

June 2008

Creating a Culture of Deliberate Excellence An Affirmative Action Employer

B-1 SECTION 0040: FORM OF PROPOSAL - Page 19 of 20

BALTIMORE (DIVISION OF BUSINESS SERVICES 6901 CHARLES STREET, BUILDING E TOWSON, MARYLAND 21204	DEPARTMENT OF FISCAL SERVICES DEPARTMENT OF FISCAL SERVICES
NEW SCHOOL CONS DEMOLITION	TRUCTION – LANSDOWNE ELEMENTARY SCHOOL N OF LANSDOWNE ELEMENTARY SCHOOL
PLEA	ASE CHECK THE APPROPRIATE ITEM/S
1. We wish to submit a NO B	ID at this time. The reason for submitting a NO BID is:
*Failure to complete the above and from the Baltimore County Public Sch	d return this form to the Purchasing Office may result in your <u>removal</u> ool approved vendor list for this bid.
2. Please include our name to GOODS/SERVICES:	RECEIVE FUTURE BIDS/PROPOSALS for the FOLLOWING
4. Please COMPLETE the following: Is your company a certified Minority Busin Please indicate which group qualifies the African American Asian Women Hisp	ness Enterprise with State of Maryland?YesNo MDOT# business as a Minority Business Enterprise. anic American Indian Physically or Mentally disabled individual
Is your company a small business with les (10) million dollars?YesNo	ss than fifty (50) employees which generates annual revenue less than ten
Is your business located within Baltimore	County, Maryland?YesNo
COMPANY	
AUTHORIZED SIGNATURE	
TYPED NAME/TITLE	
ADDRESS	
CITY/STATE/ZIP	
PHONE	FAX
EMAIL Return to:	Baltimore County Public Schools Purchasing Officer 6901 Charles Street, Building E Towson, MD 21204

END OF SECTION 00400: FORM OF PROPOSAL

SECTION 004300 - 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 004300

MIA® 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.

1

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Signed and sealed this day of ,

(Principal) (Seal) (Witness) (Title) (Surety) (Seal) (Witness) (Title)

Init.

1

SECTION 004500 - MINORITY BUSINESS ENTERPRISE PROCEDURES

PART 1 - GENERAL

- 1.1 RELATED PRODUCTS
 - A. The Baltimore County Public School System's <u>Minority Business Enterprise Procedures</u> for State Funded Public School Construction Projects is located in <u>Part II Specifications</u> <u>– General Requirements, Paragraph 6</u>.
 - 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 004500

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 <u>Rules</u>, <u>Regulations</u>, and <u>Procedures for the Administration of the School Construction</u> <u>Program</u> 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 <u>Rules, Regulations, and Procedures were replaced by regulations</u>. 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 <u>Rules</u>. <u>Regulations</u>. and <u>Procedures for the</u> <u>Administration of the School Construction Program</u>. 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:

- 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 coowners 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

- 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 Article14-301 (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 Americanowned businesses and _____ percent from Asian American-owned businesses."
 - 2) "The subgoal established for this project is ____ percent from African Americanowned 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.
 - 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:

- 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 lowbidder 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:
 - 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;
 - 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.
 - 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.
 - 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.

- 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. <u>Subcontract agreements documenting the work performed by all MBE participants</u> 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 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.
- 1. 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.

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 _____%. and
- 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	6. Base Bid Amount
PSC No.	\$
7a. Minority Firm Name	Minority Firm Address
Minority Firm Telephone Number	Minority Group Type
Minority Firm Fax Number	(african American) (Women) (Asian) (Hispanic)
MDOT Certification Number	③ (American Indian) ③ (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 Group Type
Minority Firm Fax Number	(atrican American) (women) (atrican American American) (women) (atrican American
MDOT Certification Number	(American Indian) (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 Group Type
Minority Firm Fax Number	(african American) (women) (Momen) (women) (Women) (women) <td< td=""></td<>
MDOT Certification Number	③ (American Indian) ③ (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	11. Reviewed and Accepted by Board of Education MBE Liaison
Title	Name
Data	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 for the	with the	e bid or offer submitted in response to Baltimore County Public Schools project, PSC # I state the following:
	(nan	ne)
1)	Bidder, categor	/Offeror identified opportunities to subcontract in these specific work ries:
2)	Attache instruct	ed to this form are copies of written solicitations (with bidding tions) used to solicit certified MBEs for these subcontract opportunities.
3)	Bidder MBEs:	Offeror made the following attempts to contact personally the solicited
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 Coun	ty Public Schools		
NAME OF PRIME CONTRACTOR:				
NAME OF MBE SUBCONTRACTO	R:			
MDOT Certification Number				
1. Work/Services to be performed by	V MBE Subcontractor:			
2. Subcontract Amount: \$				
3. Bonds - Amount and type require	ed of Subcontractor if any:			
4. MBE Anticipated or Actual Com	mencement Date:		Completion Date:	
5. This MBE subcontract represents	the following percentage of the	ne total contract cost	t:	
6. This is an African American Firm	n: Yes	No		
7. This is an Asian American Owne	d Firm: Yes	No		
8. This is a Woman, American Indi (Circle One)	an, Hispanic or Disabled Firm:	Yes	No	
The undersigned subcontractor and a	ima contractor will actor into	a contract for the	out/comico indicated -t-	**

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:

Attachment E

MINORITY SUBCONTRACTOR UNAVAILABILITY CERTIFICATE

rtified that the firm of			
	(Name of Minority fir	m)	
(Number)	(Street)		
(City)	(State)	(Zip)	
portunity to bid on the		school project in	
y by(N	ame of Prime Contractor's Firm)	£5	
inable to prepare a bid for this project for	(Minority Firm), is either unavailable for the s project for the following reason(s):		
Minority Firm's MBE Representative	Title		Date
Certification #	Tele	phone #	
	rtified that the firm of (Number) (City) oportunity to bid on the y by (Number) (Number) (Number) (City) oportunity to bid on the y by (Number) (Number)	rtified that the firm of	rtified that the firm of

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:	<u>2</u>	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)

(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:

-, and I am the duly authorized representative of

Summary WIDE Farticipation Schedule from Attachment D									
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					9 A				
b. Sub Goal Asian American									
c. Other * in Sub Goal group a/b above									
TOTALS					6)				

Summary MBE Participation Schedule from Attachment B

* 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 *Min<u>ority</u> <u>Subcontractor Unavailability Certificate</u> 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	(Company Representative Name)	Date		
Sworn and sul	bscribed 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 = AAHispanic American = HNative American = NAsian American = AWomen = W African American/Women = AAW Hispanic American/Women = HW Native American/Women = NW Asian American/Women = AW

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

Instructions for Completion of IAC/PSCP Form 306.4 Page 3

THIS FORM TO BE COMPLETED BY PRIME CONTRACTOR ONLY

- 1. <u>LEA</u> Enter full name of LEA.
- 2. Facility Name Enter full name of school/facility.
- Scope of Work Enter type of work being performed (i.e. New, Renovation, Roof, HVAC, ASP Flooring, QZAB Media Center, etc.).
- 4. <u>Date</u> Date of Requisition.
- 5. <u>PSC NO</u> Enter full PSC Number as assigned by PSCP.
- 6. <u>**REQ NO**</u> Enter the number of the corresponding Requisition for Payment.
- 7. <u>Name of MBE Sub-Contractor</u> Enter full name of MBE Sub-Contractor.
- 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. <u>TOTAL MBE Contract Amount</u> 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. <u>Amount to be Paid This Requisition</u> Enter the amount to be paid to the MBE Sub-Contractor for work applicable to this requisition.
- 11. <u>TOTAL Paid to Date</u> 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. <u>MBE has Received FINAL Payment</u> 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. <u>If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE</u> 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. <u>Authorized Contractor Signature/Date</u> The authorized individual employed by the Prime Contractor who filled this form out should date and sign here.
- **16.** <u>Contractor Federal Tax ID #</u> Enter the Federal Tax ID Number of the Prime Contractor.
- 17. <u>Contractor MBE Classification #</u> Enter the MDOT MBE Classification Number if the Prime Contractor is a MDOT certified MBE Company.
- **18.** <u>Name of LEA MBE Liaison</u> 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.
- 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 005000 - 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 005000

▲IA® 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 words, indicate day, month and year)

in the 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.

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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
- **DISPUTE RESOLUTION** 6
- 7 **TERMINATION OR SUSPENSION**
- 8 **MISCELLANEOUS PROVISIONS**
- 9 **ENUMERATION OF CONTRACT DOCUMENTS**
- 10 **INSURANCE AND BONDS**

THE CONTRACT DOCUMENTS ARTICLE 1

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.

THE WORK OF THIS CONTRACT ARTICLE 2

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

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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.

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§ 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.
- Add that portion of the Contract Sum properly allocable to materials and equipment delivered and .2 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:

- Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to .1 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.

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(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.

MISCELLANEOUS PROVISIONS ARTICLE 8

§ 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

ENUMERATION OF CONTRACT DOCUMENTS ARTICLE 9

§ 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)
6 9.1.6 The Addenda, if any:

Init.

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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.

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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 005100 - 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 005100

IAC/PSCP FORM 306.4

PAGE 1 OF 31

DATE: ____ PROJECT TITLE:

LOCATION:

LEA:

PSC NO:

LOCATION	٧:			REQ NO:		
			COMF	PLETED		
C.S.I.	CATEGORY	TOTAL	TO %	DATE		PAYMENT
		0031	70	φ	REQUISITIONS	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 SUPRESSION	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
l	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

STAND		NONTHLY CONT	RACTOR'S				IAC/PSCP FORM 306.4		
REQUI	SITION	N FOR PAYMENT	•				PAGE 2 OF 31		
LEA:	<u>0</u>				DATE:	01/00/00			
PROJECT	TITLE:	0			PSC NO:	0			
LOCATIO	N:	0			REQ NO:	0.00			
	I certify and will are rece	the above estimates and be, made to suppliers a eived, and in accordance	that timely payments have nd subcontractors on this pro with our contracts.	been (except initial su oject, as requisitioned	ubmission), payments				
		Name of Con	tractor Firm		Authorized	Signature			
			NOTARIZATION						
	County			, to v	vit:				
	I hereby	certify that on this	day of	in the year of					
	before r	ne, a Notary Public for s	aid County, personally appea	ared	,				
	and ma	de oath in due form of la	w that he/she is						
	of		, and on behalf c	f said firm stated that	the				
	matters	and facts set forth in the	e foregoing verification are tru	ue to the best of his/h	er knowledge,				
	information	information and belief. He/she acknowledged that he/she executed the same purposes herein							
	containe	ed and that they had full	authority to execute same.						
		As witness my hand a	nd official seal:						
					NOTARY	PUBLIC			
				Му со	mmission expires _		-		
	Reviewe	ed and agreed justified to	o the best of my knowledge:						
					(15:5				
	Remark	Architect Sigr	ature/Date	Sigr	ature of LEA Repre	esentative/Date			
		-							
<u> </u>									

STANDARD MONTHLY CONTRACTOR'S

IAC/PSCP FORM 306.4

REQUISITION FOR			PAGE 3 OF 31	
LEA:	0	DATE:	01/00/00	
FACILITY NAME:	0	PSC NO:	0	
SCOPE OF WORK:		REQ NO:	0.00	

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

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

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. <u>LEA</u> 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. <u>Date</u> Date of Requisition.
- 5. <u>PSC NO</u> Enter full PSC Number as assigned by PSCP.
- 6. <u>REQ NO</u> 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. <u>TOTAL Paid to Date</u> Enter the TOTAL amount paid to date to the MBE Sub-Contractor this amount should NOT
- **12. <u>MBE has Received FINAL Payment</u> 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. <u>Name of Contractor Firm</u> Enter full name of Prime Contractor.
- 15. <u>Authorized Contractor Signature/Date</u> 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

IAC/PSCP F	ORM	306.4
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PAGE 5 OF 31

LEA: 0		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

		TOTAL	COMPLETED			CURRENT
C.S.I.	CATEGORY	COOT	10			PAYMENT
		COST	%	\$	REQUISITIONS	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

IAC/PSCP FORM 306.4

PAGE 6 OF 31

LEA:	0		DATE:	01/00/00
PROJECT	TITLE:	0	PSC NO:	0

	1		COM			
		TOTAL	COM		BBIOD	CURRENT
C.S.I.	CATEGORY	TOTAL	10	DATE	PRIOR	PAYMENT
		COST	%	\$	REQUISITIONS	DUE
						DOE
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 25 00	Contract Medification Procedures					0.00
01 20 00	Pourment Presedures					0.00
01 29 00	Administrative Requirements					0.00
01 30 00	Administrative Requirements					0.00
01 31 00	Project Management & Coordination					0.00
01 32 00						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 74 00	Starting & Adjusting					0.00
01 75 00	Protecting Installed Construction					0.00
01 77 00						0.00
017700						0.00
01 78 00	Demonstration 9 Training					0.00
01 /9 00	Demonsu duon & Hammy					0.00
01 80 00	Penormance Requirements					0.00
01 81 00	Facility Performance Requirements					0.00
01 82 00	Facility Substructure Performance Requirements					0.00
01 83 00	Facility Snell Performance Requirements			ļ		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		1			0.00

IAC/PSCP FORM 306.4

PAGE 7 OF 31

01/00/00 LEA: <u>0</u>_____DATE: 0 PROJECT TITLE: 0 PSC NO:

1							
					PRIOR	CURRENT	
C.S.I.	CATEGORY	COST	0/	¢	REQUISITIONS	PAYMENT	
		0001	70	φ	REGUISITIONS	DUE	
01.87.00	Equipment & Euroishings Performance Requirements					0.00	
01 88 00	Other Eacility Construction Performance Requirements					0.00	
01 80 00	Site Construction Performance Requirements	-				0.00	
01 89 00	Life Cycle Activities					0.00	
01 90 00						0.00	
01 91 00	Eacility Operation					0.00	
01 92 00						0.00	
01 93 00						0.00	
01 94 00						0.00	
-		0.00		0.00	0.00	0.00	
02.00.00		0.00		0.00	0.00	0.00	
02 00 00	Maintenance of Existing Conditions					0.00	
02 01 00	Common Work Results for Existing Conditions					0.00	
02 05 00	Schedules for Existing Conditions					0.00	
02 00 00	Commissioning of Existing Conditions					0.00	
02 08 00		-				0.00	
02 20 00	Surveye	-				0.00	
02 21 00	Existing Conditions Assessment	-				0.00	
02 22 00	Environmental Assessment	-				0.00	
02 24 00	Existing Material Assessment					0.00	
02 25 00	Hazardous Material Assessment					0.00	
02 26 00	Subsurface Investigation					0.00	
02 30 00	Coophysical Investigations					0.00	
02 31 00						0.00	
02 32 00	Demolition & Structure Moving	-				0.00	
02 40 00	Demolition & Structure Moving					0.00	
02 41 00	Bemoval & Saluciate Moving					0.00	
02 42 00	Structure Moving					0.00	
02 43 00	Site Remodiation					0.00	
02 50 00	Physical Decontamination					0.00	
02 51 00						0.00	
02 52 00						0.00	
02 53 00	Riological Decontamination					0.00	
02 54 00	Pomodiation Soil Stabilization					0.00	
02 55 00						0.00	
02 56 00	Site Containment					0.00	
02 57 00	Show Control					0.00	
02 58 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 02 00	Underground Storage Tank Removal	+				0.00	
02 00 00	L and fill Construction & Storage	+				0.00	
02 00 00	Water Remediation					0.00	
02 70 00	Groundwater Treatment					0.00	
027100	Water Decontamination					0.00	
02 12 00	Facility Remediation	+				0.00	
02 00 00	Transportation & Disposal of Hazardous Material	+				0.00	
02 01 00	Ashestos Remediation					0.00	
02 82 00	Lead Remediation					0.00	
02 84 00	Polychlorinated Binhanyl Remediation					0.00	
02 04 00						0.00	
02 05 00	Hazardous Waste Drum Handling					0.00	
02 00 00	Othor					0.00	
		0.00		0.00	0.00	0.00	
		0.00		0.00	0.00	0.00	

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LEA: 0		DATE:	01/00/00
PROJECT TITLE	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

		TOTAL	CON	IPLETED	PRIOR REQUISITION	CURRENT PAYMENT
C.S.I.	CATEGORY		IC	DATE		
		COST	%	\$	S	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	Eabric & Grid Reinforcing					0.00
03 23 00	Stressed Tendon Reinforcing					0.00
03 24 00	Eibrous Reinforcing					0.00
03 24 00	Composite Reinforcing					0.00
02 33 00	Composite Reinfording			-		0.00
03 30 00	Structural Concrete			-		0.00
03 31 00				-		0.00
03 33 00	Low Density Concrete					0.00
03 34 00						0.00
03 35 00	Concrete Finishing					0.00
03 37 00	Specially Placed Concrete					0.00
03 38 00	Post-reinsioned Concrete					0.00
03 39 00	Concrete Curing					0.00
03 40 00	Precasi 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 Specialities					0.00
03 49 00	Glass-Fiber-Reinforced Concrete					0.00
03 50 00	Cast Decks & Underlayment					0.00
03 51 00						0.00
03 52 00						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

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LEA: <u>0</u>		DATE:	01/00/00
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LOCATION:

		ΤΟΤΑΙ	COM		PRIOR	CURRENT
C.S.I.	CATEGORY	COST	%	\$	REQUISITION S	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

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CSI	CATEGORY	TOTAL	COMPLETED TO DATE		PRIOR	
0.0.1.	UNIL CONT	COST	%	\$	S	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

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PROJECT TITLE:	0	PSC NO:	0
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		τοται	TO DATE		PRIOR	CURRENT
C.S.I.	CATEGORY	COST	%	\$	REQUISITION	PAYMENT
			70	Ψ	S	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		t			0.00
06 66 00	Custom Ornamental Simulated Woodwork		t			0.00
06 70 00	Structural Composites		1			0.00
06 71 00	Structural Composite Shapes & Plates		t			0.00
06 72 00	Composite Structural Assemblies		t			0.00
06 73 00	Composite Decking		İ			0.00
06 74 00	Composite Gratings		Ì			0.00
06 80 00	Composite Fabrications		Ì			0.00
06 81 00	Composite Railing		1			0.00
06 83 00	Composite Paneling		İ			0.00
	Other					0.00
	TOTAL WOOD, PLASTICS, & COMPOSITES	0.00		0.00	0.00	0.00

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LEA: 0		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
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		TOTAL	COMPLETED		PRIOR	CURRENT	
C.S.I.	CATEGORY	COST			REQUISITION	PAYMENT	
		0051	%	\$	S	DUE	
07 00 00	THERMAL & MOISTURE PROTECTION						
07 00 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	
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01/00/00

<u>0</u>_____DATE: 0 PROJECT TITLE: 0 PSC NO:

LOCATION: 0.00

C.S.I. CATEGORY TOTAL COST TOTAL TOTAL COST TOTAL TOTAL TOTAL S PRIOR REDUISTING S CURRENT REDUISTING S 07 80 00 Fire stopping 0	r			COM			
C.S.I. CATEGORY DOME COST IDUME COST REQUISITION 8 PAVMENT DUE 07 9100 Fire adopting I I I I 0.00 07 9000 Sinola Seals I I I 0.00 07 9000 Sinola Seals I I I 0.00 07 9000 Joint Productions I I 0.00 0.00 07 9000 Joint Productions Seals I I 0.00 0.00 07 9000 Expansion Control I I 0.00 0.00 0.00 07 900 Operation & Mainsmance of Operings I I I 0.00 0.00 08 00 Operation & Mainsmance of Operings I I I I 0.00 08 010 Operation & Firms I </td <td></td> <td></td> <td>τοται</td> <td></td> <td></td> <td>PRIOR</td> <td>CURRENT</td>			τοται			PRIOR	CURRENT
UNS1 70 S S DUE 07 14 00 Fire stopping 0.00 0.00 0.00 0.00 07 16 00 Sincke Saals 0.00 0.00 0.00 0.00 07 16 00 Sincke Constment Barriers 0.00 0.00 0.00 0.00 0.00 0.00 07 16 00 Prestressations 0.00 <td< td=""><td>C.S.I.</td><td>CATEGORY</td><td>COST</td><td></td><td></td><td>REQUISITION</td><td>PAYMENT</td></td<>	C.S.I.	CATEGORY	COST			REQUISITION	PAYMENT
07 44 00 Fire stapping 0 0 0.00 07 66 00 Smoke Senas 0 0 0.00 07 67 00 Smoke Containment Barriers 0 0 0.00 07 67 00 Smoke Senas 0 0 0.00 07 67 00 Smoke Senas 0 0 0.00			CUST	%	\$	S	DUE
07 97 00 Smoke Seals 0 0 0 07 97 00 Smoke Containment Barriers 0 0 0 07 91 00 Pretored.Joint Seals 0	07 84 00	Fire stopping					0.00
07 97 00 Sinska Contannent Barriers 0	07 86 00	Smoke Seals					0.00
107 0000 Limit Protection 0000 071 00 Preformed Lant Sals 0000 071 00 Preformed Lant Sals 0000 076 00 Figuration Control 0000 076 00 Figuration Control 0000 08 00 00 OPENINGS 0000 08 00 00 OPENINGS 0000 08 00 00 OPENINGS 0000 08 00 00 OPENINGS 0000 08 00 00 OPENINGS 0000 08 00 00 OPENINGS 0000 08 00 00 OPENINGS 0000 08 00 00 Schedules tor Openings 0000 08 00 00 Schedules tor Openings 0000 08 01 00 Doors & Franes 0000 00 00 00 OPENINGS 0000 00 00 00 Doors & Franes 0000 00 00 00 Doors & Franes 0000 00 00 00 OPENINGS 0000 00 00 00 Scheid boors & Franes 0000 00 00 00 Scheid fourciton Doors	07 87 00	Smoke Containment Barriers					0.00
0.737 100 Testomest Joint Sasis 0.00 078 400 Joint Sasiants 0.00 0.000 Order 0.00 0.00 0.000 OPENINGS 0.00 0.00 0.000 OPENINGS 0.00 0.00 0.000 Common Work Results for Openings 0.00 0.00 0.000 Common Work Results for Openings 0.00 0.00 0.000 Commissioning of Openings 0.00 0.00 0.000 Commissioning of Openings 0.00 0.00 0.100 Metal Doros & Frames 0.00 0.00 0.100 Metal Doros & Frames 0.00 0.00 0.100 Metal Doros & Frames 0.00 0.00 0.100 Oros and 0.00 0.00 0.00 0.100 Oros and 0.00 <td>07 90 00</td> <td>loint Protection</td> <td></td> <td></td> <td></td> <td></td> <td>0.00</td>	07 90 00	loint Protection					0.00
0.97 800 Join Sealants 0.00 07 0 TOTAL THERMAL & MOISTURE PROTECTION 0.00 0.00 08 00 OPENNOS 0.00 0.00 08 00 OPENNOS 0.00 0.00 08 010 Opension Store Openings 0.00 0.00 08 010 Doors & Frames 0.00 0.00 08 100 Doors & Frames 0.00 0.00 08 100 Doors & Frames 0.00 0.00 08 100 Meal Frames 0.00 0.00 08 100 Openings 0.00 0.00 0.00 08 100 Meal Frames 0.00 0.00 0.00 08 100 Composite Doors 0.00 0.00 0.00 0.00 08 100 Composite Doors	07 01 00	Preformed Joint Seals					0.00
0 8 00 Definition Control 0.00 Of R6 00 Expansion Control 0.00 O 76 00 Expansion Control 0.00 O 77 AL THERMAL & MOISTURE PROTECTION 0.00 0.00 86 00 OPENINGS 0.00 86 01 00 Openings 0.00 86 03 00 Common Work Results for Openings 0.00 86 03 00 Commissioning of Openings 0.00 86 04 00 Openings 0.00 98 100 00 84 Frames 0.00 98 100 00 76 84 Frames 0.00 98 100 00 76 84 Frames 0.00 98 100 00 76 84 Frames 0.00 98 100 00 76 84 Frames 0.00 98 100 00 76 84 Frames 0.00 98 100 00 76 84 Frames 0.00 98 100 00 78 44 Frames 0.00 98 100 00 78 47 Frames 0.00	07 91 00	loint Sealants					0.00
00 Hor Conter 0.00	07 92 00	Expansion Control					0.00
Otional THERMAL & MOISTURE PROTECTION 0.00 0.00 0.00 0.00 06 000 OPENINGS 0 0.00 0.00 0.00 06 000 OPENINGS 0 0.00 0.00 0.00 08 05 00 Common Work Results for Openings 0 0.00 0.00 08 05 00 Commissioning of Openings 0 0.00 0.00 08 100 Doots & Frames 0 0.00 0.00 08 1100 Metal Doors & Frames 0 0.00 0.00 08 1100 Metal Doors & Frames 0 0.00 0.00 08 1100 Metal Doors & Frames 0 0.00 0.00 08 1100 Metal Doors & Frames 0 0.00	07 95 00						0.00
B 0000 OPENINS 0.00 0.00 0.00 0.00 66 010 Operation & Maintenance of Openings 0.00 66 010 Operation & Maintenance of Openings 0.00 0.00 86 06 00 Operation & Maintenance of Openings 0.00 0.00 86 06 00 Openings 0.00 0.00 86 00 Doors & Frames 0.00 0.00 86 100 Doors & Frames 0.00	-		0.00		0.00	0.00	0.00
000000000000000000000000000000000000	08 00 00	OPENINGS	0.00		0.00	0.00	0.00
03 010 Unional Work Results for Openings 0.00 03 06 00 Commissioning of Openings 0.00 03 00 Dors & Frames 0.00 03 00 Dors & Frames 0.00 03 100 Metal Frames 0.00 03 110 Metal Frames 0.00 03 120 Metal Frames 0.00 03 130 Metal Frames 0.00 03 140 Metal Frames 0.00 03 130 Metal Frames 0.00 03 140 Metal Frames 0.00 03 130 Metal Frames 0.00 03 140 Metal Frames 0.00 03 150 Plastic doors 0.00 03 150 Composite Doors 0.00 03 160 Composite Doors & Frames 0.00 03 100 Special Function Doors 0.00 03 100 Fraineo	08 00 00	Operation & Maintenance of Openings					0.00
36 150 Uninduit voit Akassia un optimings 0.00 36 60 Commissioning of Openings 0.00 36 600 Commissioning of Openings 0.00 36 100 Doors & Frames 0.000 86 100 Doors & Frames 0.000 08 1100 Metal Pones & Frames 0.000 08 1200 Metal Pones & Frames 0.000 08 1300 Moors & Frames 0.000 08 1400 Wood Doors 0.000 08 1500 Plastic doors 0.000 08 1600 Doors & Frames 0.000 08 100 Composite Doors 0.000 08 100 Coses Doors & Frames 0.000 08 100 Access Doors & Grilles 0.000 08 200 Siding Glass Doors 0.000 08 300 Special Function Doors 0.000 08 300 Folding Doors & Grilles	08 01 00	Common Work Booults for Openings					0.00
08.06.00 Scheelungsschrigt of Openings 0.000 08.06.00 Coronnissioning of Openings 0.000 08.100 Metal Dors & Frames 0.000 08.110 Metal Dors & Frames 0.000 08.110 Metal Dors & Frames 0.000 08.110 Metal Dors & Frames 0.000 08.120 Metal Dors & Frames 0.000 08.130 Metal Dors & Frames 0.000 08.140 Wood Doors 0.000 08.150 Metal Doors & Frames 0.000 08.160 Composite Doors & Frames 0.000 08.100 Special Doors & Frames 0.000 08.200 Special Poors & Frames 0.000 08.300 Coling Doors & Griles 0.000 08.300 Coling Doors & Griles 0.000 08.300 Special Function Doors 0.000 08.300 Paecial Function Doors 0.000 08.300 Paecial Function Doors 0.000 08.300 Paecial Function Doors 0.000 08.300 P	08 05 00						0.00
08.00 Contrast Prames 0.00 08.100 Doors & Frames 0.00 08.100 Doors & Frames 0.00 08.100 Metal Porrs & Frames 0.00 08.100 Metal Doors & Frames 0.00 08.100 Metal Doors & Frames 0.00 08.100 Concest & Frames 0.00 08.100 Concest Doors 0.00 08.100 Concest Doors 0.00 08.100 Concest Doors & Frames 0.00 08.200 Silding Glass Doors 0.00 08.200 Silding Glass Doors 0.00 08.300 Folding Doors & Grilles 0.00 08.300 Folding Doors & Grilles 0.000 08.300 Panel Doors 0.00 08.300 Panel Doors 0.000 08.400 Entrances & Storefronts, & Curtain Walls 0.000	08 06 00	Schedules for Openings					0.00
08 100 Dors & Frames 0 0.00 08 1100 Metal Frames 0.00 08 120 Metal Frames 0.00 08 120 Metal Porns & Frames 0.00 08 140 Wood Doors 0.00 08 1500 Plastic doors 0.00 08 1500 Plastic doors 0.00 08 1600 Composite Doors & Frames 0.00 08 1700 Integrated Door S Frames 0.00 08 300 Special Doors & Frames 0.00 08 300 Special Doors & Frames 0.00 08 300 Special Doors & Frames 0.00 08 300 Special Doors & Grilles 0.00 08 300 Special Function Doors 0.00 08 300 Panel Doors 0.00 08 300 Panel Doors 0.00 08 300 Panel Doors 0.00 08 300 Panel Doors 0.00 08 400 Entrances, Xoreforuts 0.00 08 400 Entrances & Storeforuts 0.00 <td< td=""><td>00 80 80</td><td></td><td></td><td></td><td></td><td></td><td>0.00</td></td<>	00 80 80						0.00
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08 12 00 Metal Frames 0 0.00 08 13 00 Metal Doors & Frames 0 0.00 08 14 00 Wood Doors 0 0.00 08 15 00 Plastic doors 0 0.00 08 15 00 Composite Doors 0 0.00 08 16 00 Composite Doors 0 0.00 08 17 00 Integrated Door Opening Assemblies 0 0 0.00 08 30 00 Specially Doors & Frames 0 0.00 0.00 08 31 00 Access Doors & Frames 0 0.00 0.00 0.00 08 31 00 Coling Doors & Grilles 0 0.00<	08 11 00	Metal Doors & Frames					0.00
08 13 00 Metal Joors & Frames 0 0.00 08 14 00 Wood Doors 0 0.00 08 15 00 Plastic doors 0 0.00 08 16 00 Composite Doors 0 0.00 08 16 00 Composite Doors & Frames 0 0.00 08 30 00 Specialty Doors & Frames 0 0.00 08 31 00 Access Doors & Panels 0 0.00 08 32 00 Sliding Glass Doors 0 0.00 08 32 00 Special Function Doors 0 0.00 08 32 00 Folding Doors & Grilles 0 0.00 08 32 00 Folding Doors & Grilles 0 0.00 08 32 00 Folding Doors & Crilles 0 0.00 08 30 0 Panel Doors 0 0.00 08 30 0 Panel Doors 0 0.00 08 40 00 Entrances, Storefronts 0 0.00 08 40 00 Entrances Storefronts 0.000 08 42 00 Entrances 0.000 </td <td>08 12 00</td> <td>Metal Frames</td> <td></td> <td></td> <td></td> <td></td> <td>0.00</td>	08 12 00	Metal Frames					0.00
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08 15 00 Plastic doors 0.00 08 16 00 Composite Doors 0.00 08 17 00 Integrated Door Opening Assemblies 0.00 08 31 00 Access Doors & Pranels 0.00 08 31 00 Access Doors & Pranels 0.00 08 32 00 Sliding Glass Doors 0.00 08 32 00 Sliding Glass Doors 0.00 08 32 00 Special Function Doors 0.00 08 32 00 Special Function Doors 0.00 08 32 00 Special Function Doors 0.00 08 32 00 Folding Doors & Grilles 0.00 08 300 Panel Doors 0.00 08 300 Panel Doors 0.00 08 300 Pressure-Resistant Doors 0.00 08 400 Entrances, Storefronts, & Curtain Walls 0.00 08 41 00 Entrances & Storefronts 0.00 08 42 00 Intrances 0.00 08 42 00 Gittarin Wall & Rod Assemblies 0.00 08 43 00 Storefronts 0.00 08 4400	08 14 00	Wood Doors					0.00
08 16 00 Composite Doors 0.00 08 17 00 Integrated Door Opening Assemblies 0.00 08 30 00 Specially Doors & Frames 0.00 08 31 00 Access Doors & Panels 0.00 08 30 00 Specially Doors & Grilles 0.00 08 30 00 Colling Doors & Grilles 0.00 08 30 00 Special Function Doors 0.00 08 30 00 Special Function Doors 0.00 08 30 00 Panel Doors 0.00 08 30 00 Panel Doors 0.00 08 30 00 Entrances & Storefronts, & Curtain Walls 0.00 08 40 00 Entrances & Storefronts 0.00 08 40 00 Entrances 0.00 08 40 00 Entrances 0.00 08 40 00 Entrances 0.00 08 40 00 Curtain Wall & Glazed Assemblies 0.00 08 40 00 Curtain Wall & Root Assemblies 0.00 08 50 00 Windows 0.00 0.00 08 40 00 Curtain Wall & Root Assemblies 0.00	08 15 00	Plastic doors					0.00
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08 86 00 Panel Doors 0.00 08 88 00 Pressure-Resistant Doors 0.00 08 90 00 Entrances, Storefronts, & Curtain Walls 0.00 08 40 00 Entrances, Storefronts, & Curtain Walls 0.00 08 41 00 Entrances, Storefronts 0.00 08 42 00 Entrances & Storefronts 0.00 08 43 00 Storefronts 0.00 08 44 00 Curtain Wall & Glazed Assemblies 0.00 08 44 00 Curtain Wall & Roof Assemblies 0.00 08 45 00 Translucent Wall & Roof Assemblies 0.00 08 50 00 Windows 0.00 0.00 08 51 00 Metal Windows 0.00 0.00 08 52 00 Wood Windows 0.00 0.00 08 52 00 Wood Windows 0.00 0.00 08 54 00 Composite Windows 0.00 0.00 08 54 00 Pressure-Resistant Windows 0.00 0.00 08 55 00 Special Function Windows 0.00 0.00 08 64 00 Roof Windows	08 35 00	Folding Doors & Grilles					0.00
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	08 75 00	Window Hardware					0.00

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DATE: 01/00/00

PROJECT TITLE: 0 PSC NO:

LOCATION:

_PSC NO: 0_____

0______REQ NO: 0.00_____

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C.S.I.	CATEGORY	COST	%	\$	REQUISITION	PAYMENT
		0001	70	Ψ	S	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 90 00						0.00
08 97 00	Louvered Equipment Enclosures					0.00
08 95 00	Vents					0.00
08 33 00	Other					0.00
		0.00		0.00	0.00	0.00
09.00.00	FINISHES	0.00		0.00	0.00	0.00
09 00 00	Maintenance of Finishes					0.00
09 01 00	Common Work Results for Finishes			-		0.00
09 05 00	Schedules for Finishes					0.00
09 00 00	Room Finish Schedule					0.00
09 00 00.13	Commissioning of Finishes					0.00
09 00 00	Plaeter & Cypeum Board			-		0.00
09 20 00	Plaster & Cypsum Board Assemblies			-		0.00
09 21 00	Supports for Plaster & Gypsum Board			-		0.00
09 22 00				-		0.00
09 23 00	Comont Plastering					0.00
09 24 00	Other Plastering					0.00
09 25 00	Veneer Plastering					0.00
09 26 00	Plactor Exprincipa					0.00
09 27 00	Provide Populations					0.00
09 28 00						0.00
09 29 00	Tiling					0.00
09 30 00	Thin Set Tiling					0.00
09 31 00	Marter Red Tiling					0.00
09 32 00	Conductive Tilling					0.00
09 33 00	Waterproofing Membrane Tiling					0.00
09 34 00	Chemical Desistant Tiling					0.00
09 35 00						0.00
09 50 00	Accuration Collings					0.00
09 51 00	Acoustical Cellings					0.00
09 53 00	Acoustical Celling Suspension Assemblies					0.00
09 54 00	Specially Cellings					0.00
09 56 00	Preside Cellings					0.00
09 57 00	Special Function Cellings					0.00
00 60 00				<u> </u>		0.00
00 00 00				<u> </u>		0.00
09 61 00	Flooring Healinent					0.00
09 62 00	Masonny Flooring			<u> </u>		0.00
09 63 00	IvidSulliy Flooling					0.00
09 64 00						0.00
09 65 00						0.00
09 66 00	Lerrazzo Flooring					0.00
09 67 00	IFiula-Applied Flooring					0.00
09 68 00						0.00
09 69 00	Access Flooring					0.00

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LE	EA:	

<u>0</u>_____DATE: 01/00/00

PROJECT TITLE: 0 PSC NO:

C.S.I.	CATEGORY	TOTAL COST	CON TC %	IPLETED 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						0.00
10 14 00	Signage					0.00
10 17 00	Informational Kiocke					0.00
10 18 00	Interior Specialties					0.00
10 20 00	Compartments & Cubicles					0.00
10 21 00	Partitions					0.00
10 22 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

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LEA:	0		DATE:
PROJECT	TITLE: (0	PSC NO:

DATE: 01/00/00

		TOTAL	COMPLETED		PRIOR	CURRENT
C.S.I.	CATEGORY	IOTAL	TC	DATE	REQUISITION	PAYMENT
		COST	%	\$	S	DUE
10 74 00	Manufactured Exterior Specialties					0.00
10 74 00	Flannoles					0.00
10 /5 00	Other Specialties					0.00
10 81 00	Past Control Davices					0.00
10 01 00	Grilles & Screens					0.00
10 02 00	Flags & Banners					0.00
10 03 00	Gas Lighting					0.00
10 04 00	Security Mirrors & Domes					0.00
10 86 00						0.00
10 00 00		0.00		0.00	0.00	0.00
11 00 00		0.00		0.00	0.00	0.00
11 00 00	Operation & Maintonance of Equipment					0.00
11 01 00	Common Work Results for Equipment			-		0.00
11 05 00	Schedules for Equipment					0.00
11 06 00	Commissioning of Equipment					0.00
11 00 00						0.00
11 10 00	Vehicle Service Equipment			<u> </u>		0.00
11 11 00	Parking Control Equipment			<u> </u>		0.00
11 12 00	raiking Collitor Equipment			<u> </u>		0.00
11 13 00	Dedectrice Control Equipment					0.00
11 13 00	Pedestrian Control Equipment					0.00
11 15 00	Security, Detention & Banking Equipment					0.00
11 16 00	Vauit Equipment					0.00
11 17 00	Converte 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	Definented Direke Equipment					0.00
11 22 00	Retrigerated 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						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	Reliaciable Stalls					0.00
11 34 00						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	IF OOD Dispensing Equipment					0.00
11 47 00	Ice wachines					0.00
11 48 00	Cleaning & Disposal Equipment					0.00
11 50 00						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

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LEA:	0		DATE:	01/00/00
PROJECT	TITLE:	0	PSC NO:	0

n		1	001		1	
		TOTAL		IPLETED	PRIOR	CURRENT
C.S.I.	CATEGORY	TOTAL	IC	DATE	REQUISITION	PAYMENT
		COST	%	\$	S	DUE
					_	
11 59 00						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 & I reatment 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 Shuttles					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	1				0.00
12 40 00	Furnishings & Accessories	1				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 44 00	Bedroom Furnishings					0.00
12 40 UU						0.00

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LEA: 0		DATE:	01/00/00
PROJECT TITLE	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

681	CATEGODY	TOTAL	COM TC	IPLETED) DATE		
0.3.1.	CATEGORI	COST	%	\$	S	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

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LEA: 0		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

	CATEGORY	TOTAL			PRIOR	CURRENT
C.S.I.		TOTAL	IC	DATE	REQUISITION	PAYMENT
		COST	%	\$	S	DUE
14 00 00						
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

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LEA: <u>0</u>		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

C.S.I.	CATEGORY	TOTAL COST	COM TC %	IPLETED DATE \$	PRIOR REQUISITION S	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

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LEA: <u>0</u>		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

LOCATION:

CSI	CATEGORY	TOTAL	COMPLETED TO DATE		PRIOR	CURRENT
0.0.11		COST	%	\$	S	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

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PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

		COMPLETED		IPLETED	PRIOR	CURRENT
CSI	CATEGORY	TOTAL	TC) DATE	REQUISITION	PAYMENT
0.0.1.	OATEGORT	COST	%	\$	S	DUE
					5	DOL
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 23 00	HVAC Air Distribution					0.00
23 30 00	HVAC Ducts & Casings					0.00
23 31 00						0.00
23 32 00		-				0.00
23 33 00						0.00
23 34 00	Special Exhaust Systems					0.00
23 35 00						0.00
23 36 00						0.00
23 27 00	All 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						0.00
23 50 00						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	ļ			ļ	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	T	1		T	0.00
23 75 00	Custom-Packaged Outdoor HVAC Equipment	I	1		T	0.00
23 76 00	Evaporative Air-Cooling Equipment		İ			0.00
23 80 00	Decentralized HVAC Equipment					0.00
23 81 00	Decentralized Unitary HVAC Equipment		1			0.00
23 82 00	Convection Heating & Cooling Units		1			0.00
			1		1	2.90

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01/00/00

<u>0</u>_____DATE: 0

PROJECT TITLE: 0 PSC NO:

		COMPLETE		IPLETED	PRIOR	CURRENT
CSI	CATEGORY	TOTAL	TC) DATE	REQUISITION	PAYMENT
0.0.1.	0/1200101	COST	%	\$	S	DUE
22.82.00	Padiant Heating Lipite					0.00
23 83 00	Humidity Control Equipment					0.00
23 64 00						0.00
		0.00		0.00	0.00	0.00
25 00 00		0.00		0.00	0.00	0.00
25 00 00	Operation & Maintenance of Integrated Automation					0.00
25 05 00	Common Work Results for Integrated Automation					0.00
25 05 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 13 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
20 00 00	Integrated Automation Instrumentation & Terminal Devices for					0.00
25 31 00	Facility Equipment					0.00
25 22 00	Integrated Automation Instrumentation & Terminal Devices for					
25 32 00	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
	Integrated Automation Instrumentation & Terminal Devices for					0.00
25 38 00	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 &					
20 00 00	Security Systems					0.00
	Other					0.00
	TOTAL INTEGRATED AUTOMATION	0.00		0.00	0.00	0.00

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LEA: <u>0</u>		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

LOCATION:

C.S.I.	CATEGORY	TOTAL	COMPLETED TO DATE			
		COST	%	\$	S	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

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LEA: 0		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

C.S.I.		τοται	COMPLETED TO DATE		PRIOR REQUISITION	CURRENT PAYMENT
	CATEGORY	COST				
			70	φ	S	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

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LEA: 0		DATE:	01/00/00
PROJECT TITLE:	0	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

		ΤΟΤΑΙ	COMPLETED		PRIOR	CURRENT
C.S.I.	CATEGORY	COST			REQUISITION	PAYMENT
		0031	%	Ф	S	DUE
28.00.00						
28 00 00	Operation & Maintenance of Electronic Safety & Security					0.00
28 01 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						0.00
31 22 00						0.00
31 23 00	Excavation & Fill					0.00
31 24 00	Emparisments Erosion & Sodimontation Controls					0.00
31 20 00	Earthwork Methods			<u> </u>		0.00
31 30 00				<u> </u>		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	1			<u> </u>	0.00
31 40 00	Shoring & Underpinning	1			<u> </u>	0.00
31 41 00	Shoring & Underpinning	1				0.00
31 43 00	Concrete Raising	1				0.00
31 45 00	Vibroflotation & Densification	1				0.00
31 46 00	Needle Beams	1				0.00
31 48 00	Underpinning					0.00
31 50 00	Excavation Support & Protection					0.00
31 51 00	Anchor Tiebacks					0.00
			l	l	I	0.00

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

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LEA: 0		DATE:	01/00/00
PROJECT TITLE	: <u>0</u>	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

		τοται	CON		PRIOR	CURRENT
C.S.I.	CATEGORY	COST	%	\$	REQUISITIONS	PAYMENT
			70	Ψ		DUE
31 53 00	Cribbing & Walers					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	l urt & 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	I ransplanting	_				0.00
	Other					0.00
	TOTAL EXTERIOR IMPROVEMENTS	0.00		0.00	0.00	0.00

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

IAC/PSCP FORM 306.4

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LEA:	0		DATE:
PROJECT	TITLE:	0	PSC NO:

LOCATION:

PSC NO: 0

0______REQ NO: 0.00

			CON	IPLETED		
6.61	CATECORY	TOTAL	тс) DATE		
0.5.1.	CATEGORI	COST	%	\$	REQUISITION e	
					3	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 Litility Severage Pining					0.00
33 33 00	Low Pressure Utility Severage					0.00
33 34 00	Sanitary Litility Severage Force Mains					0.00
33 39 00	Sanitary Litility Sewerage Structures					0.00
33 40 00	Storm Drainage Litilities					0.00
33 40 00	Storm Litility Drainage Pining					0.00
33 42 00	Culverts					0.00
33 44 00	Storm Itility Water Drains					0.00
33 45 00	Storm Litility Drainage Pumps					0.00
33 45 00				-		0.00
33 40 00	Storm Drainage Structures			-		0.00
33 49 00				-		0.00
33 60 00	Hydronic & Steam Energy Otimies			-		0.00
33 67 00	Steam Energy Distribution					0.00
33 03 00						0.00
33 70 00	Electrical Utility Transmission & Distribution					0.00
22 75 00	High Voltage Switchgear & Protection Devices			-		0.00
33 75 00	Modium Voltage Utility Switchgear & Protection Devices					0.00
33 77 00	Site Grounding					0.00
33 79 00						0.00
		0.00		0.00	0.00	0.00
24.00.00		0.00		0.00	0.00	0.00
34 00 00						0.00
	Other					0.00
		0.00		0.00	0.00	0.00
		0.00		0.00	0.00	0.00
35 00 00						0.00
	Other					0.00
		0.00		0.00	0.00	0.00
		0.00		0.00	0.00	0.00
40 00 00						0.00
						0.00
		0.00		0.00	0.00	0.00
<u> </u>	TOTAL PROCESS INTEGRATION	0.00		0.00	0.00	0.00

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

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LEA: 0		DATE:	01/00/00
PROJECT TITLE:	<u>0</u>	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

			CON	IPLETED	55105	
0.01	CATECODY	TOTAL	TO DATE		PRIOR	
0.5.1.	CATEGORY	COST	%	\$	REQUISITION	
					3	DOE
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, & STORAG					
-	Other					0.00
						0.00
	TOTAL PROCESS GAS & LIQUID HANDLING, PURIFICATION, & S	0.00		0.00	0.00	0.00
44 00 00	POLLUTION & WASTE CONTROL EQUIP					0.00
	Other					0.00
		0.00		0.00	0.00	0.00
45 00 00	INDUSTRY-SPECIFIC MANUFACTURING FOUR	0.00		0.00	0.00	0.00
45 00 00						0.00
						0.00
	TOTAL INDUSTRY-SPECIFIC MANUFACTURING EQUIP	0.00		0.00	0.00	0.00
46 00 00	WATER & WASTEWATER EQUIP	0.00		0.00	0.00	0.00
	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

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LEA:	0				DATE:	01/00/00	
PROJECT	TITLE:	0			PSC NO:	0	
LOCATION	l:	0			REQ NO:	0.00	
C/O			TOTAL		IPLETED DATE	PRIOR	CURRENT
Number		Brief Description	COST	%	\$	REQUISITIONS	DUE
-							
						-	
						+	
						1 1	
	TOTAL (Enter on page 1)				<u> </u>	

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

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LEA: 0		DATE:	01/00/00
PROJECT TITLE:	<u>0</u>	PSC NO:	0
LOCATION:	0	REQ NO:	0.00

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 Submiss	ions Only.		C05T	-
				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 006100 - 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 006100

MAIA[®] 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: \$	1		
Modifications to	o this Bond:	None	See Section 18
CONTRACTOR	AS PRINCIPAL	SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:		Signature:	
Name and		Name and	
Title:		Title:	
(Any additional	signatures appear on th	ne last page of this l	Payment Bond.)

(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.

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§ 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,
 - have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the .1 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.

Init.

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§ 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:
 - the name of the Claimant; .1
 - the name of the person for whom the labor was done, or materials or equipment furnished; .2
 - .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;
 - the date on which the Claimant last performed labor or last furnished materials or equipment for use in .5 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
 - the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the .8 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.

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§ 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 add CONTRACTOR AS PRINCIPAL	itional signatures of ad	ed parties, other than those appearing on the cover page.) SURETY		
Company:	(Corporate Seal)	Company:	(Corporate Seal)	
Signature:		Signature:		
Name and Title: Address:		Name and Title: Address:		

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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 A	S PRINCIPAL	SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:		Signature:	
Name and		Name and	
Title:		Title:	
(Any additional :	signatures appear on the	e last page of this H	Performance Bond.)

(FOR INFORMATION ONLY -- Name, address and telephone) AGENT or BROKER: (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.

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§ 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

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§ 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 addi	itional signatures of ada	led parties, other	than those appearing on the cover page.)
CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)

Signature:	
Name and Title:	
Address:	

Signature: Name and Title: Address:

SECTION 007000 - 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 007000

GENERAL CONDITIONS

MAIA® 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

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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) betweenthe 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 causethe execution of a Change Order to modify the Contract Documents.

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§ 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 ofsuch 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.
 - If a minor change in the Work (not affecting the intent of the project design) is found .3 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.
- The Contractor acknowledges and agrees that the Contract Documents are adequate and sufficient 1.2.1.3 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 oneof the items described, the plural and/or the word each shall be understood and inferred to mean as many units as arenecessary 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, becomegenerally 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 be performed, including, withoutlimitation, (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 Contractors 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

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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 negligentlycommunicate 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 thedate of this Agreement, (3) information which becomes part of the public domain by publication or otherwise not dueto 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.
- The Contractor shall specifically cause all Subcontractors or any other person or entity performing 1.7.2 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 thelocation 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 informationit 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 or 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 or 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 ofsuch default or neglect with diligence and promptness, the Owner may, in its own discretion and without prejudice toother 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 limitationof 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 ofthe rights and authority granted the Owner in the Contract Documents.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

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§ 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 tothe 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 forwhich 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 theobligations of Sections 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would havebeen 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.

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

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

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- .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.
- The Contract Sum is just and reasonable compensation for all the Work, including all unforeseen, .2 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.
- The Work will not result in the lateral or vertical movement of any structure. .4
- The Work required by the Contract Documents with regard to that Construction Phase, including, .5 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 theconstruction 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 itsown 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 andbenchmarks 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 workshall 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 tomove 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 asnecessary in the execution of the Work and prohibits the use of radios, record or tape players, etc.

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- § 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 likelihoodof any strike, work stoppage or other labor disturbance.
 - If the work is to be performed by trade unions, the Contractor shall make all necessary .1 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 councilswhich 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:

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

- represents that the Contractor has personally investigated the proposed substitute product and :1 determined that it is equal or superior in all respects to that specified;
- represents that the Contractor will provide the same warranty for the substitution that the Contractor .2 would for that specified;
- certifies that the cost data presented is complete and includes all related costs under this Contract and .3 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
- obligates itself to coordinate the installation of the accepted substitute, making such changes as may be-.4 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.

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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/ornecessary 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 becontrary 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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(Paragraphs deleted) § 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 Contractorintends 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 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 asbinding 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 bedeemed 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 withthe 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.

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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 Öwner 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 orcompletion 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 toany adjustment to the Contract Time unless the postponement or rescheduling caused an actual delay to other criticalpath 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 themaccessible 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

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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 approvedby 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 ofresponsibility 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 responsibilitiesfor 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 Owner 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 Owner shall be entitled to rely uponthe adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided the Owner and Owner 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, installedin 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.

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§ 3.12.12 All shop drawings for any architectural, structural, mechanical or electrical work must be submitted to, andapproved 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 anyadditional resubmittals.

§ 3.12.14 The Contractor shall assemble for the Owner's approval, three copies, organized in loose-leaf binders, of alloperating 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 ofthe 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, cutoff, 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.

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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 promptlyremoved 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, locationof 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 findsthat compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of suchcompliance 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 buildingprincipal 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, unlessherein 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.

§ 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 forall 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.
- Clean resilient floors thoroughly with a will rinsed mop containing only enough moisture to 6. 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.

- Remove any and all debris from premises resulting from the operation. 1.
- Remove all temporary protection. 2.
- Remove putty stains, labels, and paint from all glass an wash and polish same. 3.
- Remove all marks, stains, fingerprints, and other soil or dirt from all painted, decorated and 4. 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;
- removal of spots, plaster, concrete, grout, soil and paint from ceramic tile, marble, slabs, fixtures, .4 counters, cabinet work, equipment and other finished materials and the washing or wiping clean of such finished materials;
- cleaning of aluminum in accord with the manufacturer's recommendations; .5
- thorough cleaning of resilient floors with a well rinsed mop containing only enough moisture to .6 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, Allaccess to the site will be limited to entry designed by the Owner.

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§ 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 shallnot 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

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§ 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:

- performance of the Work; (1)
- (2)bodily injury, sickness, disease or death;
- injury to or destruction of tangible property (other than the Work itself), including the loss of use (3) 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 tieror 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;
- necessary taxes, permits, licenses, and inspections fees as required for Contractor's scope of work; (7)
- (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, orare 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

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shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which wouldotherwise 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 personsor 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 fromthe 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 ofthe Contractor, Subcontractors or suppliers, either by provisions of the Contract Documents or inherently required bythe 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 specificallyincorporated 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 orinterpretation 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 Ownershall 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 ofthe 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 awardmay 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.

The Owner and the Contractor acknowledge that they have been represented by legal counsel and have had 4.4.3 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 .

	§ L R §	4.6 ARBITRATION ITIGATION PROCEDURES efer to BCPS Part I: General Terms and Conditions. 4.6.1	
	§	4.6.2	
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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 numberand 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 principalportion 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 termsof 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 towardthe 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 bya 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:

- require that such Work be performed in strict accord with the requirements of the Contract .1 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;
- require the Subcontractor to submit certificates and waivers of liens for Work completed by it and .4 its Sub-subcontractors as a condition precedent to the disbursement of the progress payment next due and owing;
- require submission to Contractor/ Subcontractor, as the case may be, of applications for payment in-.5 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;
- report, so far as practicable, unite prices and any other feasible formula for use in the determination-.6 of costs of changes in the Work;
- require such Subcontractor to furnish the Contractor, in a timely fashion, all information necessary .7 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;
- require each Subcontractor to provide sufficient labor and materials to meet the Milestone Dates .10 and Contract Schedule;
- if required by law, require each Subcontractor to certify that it is an equal opportunity employer as ,11 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:

- assignment is effective only after termination of the Contract by the Owner or stoppage of the Work .1 by the Owner and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the .2 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.

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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 initiateslegal 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 otherwisesatisfy 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 ororder 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 conductor 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 justificationfor 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.
- When changes, alterations, deductions, or additions are so ordered, the value of such Work 7. 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.
 - A lump sum price agree to by the Owner and the Contractor, or, 7.2
 - 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.
 - Unless specified otherwise, the allowable mark-up for combined overhead 7.6 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 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.
- When the Contractor and the Owner shall fail to agree upon a lump sum price or method 7.8 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.
- 7.9 On all Work, no Contractor will be allowed any expenses, overhead, or profit for employment or another Subcontractor to perform Work for him.
- 7.10 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.
- 7.11 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.
- The Contractor shall be allowed the actual cost for rental of machine power 7.12 tools or special equipment, including fuel and lubricants which are necessaryto 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.**
- 7.13 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.
- 7.14 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.
- 7.15 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.

§ 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

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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 adjustthe 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:

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

- costs of labor, including social security, old age and unemployment insurance, fringe benefits required .1 by agreement or custom, and workers' compensation insurance;
- costs of materials, supplies and equipment, including cost of transportation, whether incorporated or .2 consumed;
- rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor .3 or others;
- .4 costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work: and
- additional costs of supervision and field office personnel directly attributable to the change. Provided .5 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 mustbe 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 creditscovering 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 indispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Orderindicating 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. Thatdetermination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of eitherparty 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, orotherwise 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 changesshall 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, norshall 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 effectivedate 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 willprevent 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 toan 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 withoutlimitation 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, lostopportunity 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 impacton 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 mayl, 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 orotherwise in default under any of the Contract Documents; provided, however, that any such holdback shall be limited toan 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 asnecessary 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 approvedschedule 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 extensionsand 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.

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§ 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 for 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 beaccompanied 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 andpayable 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 whichhave 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 eachlocation 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 Projectin 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 iscomplete. 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 andcertificates 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. Ş

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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 notpaid 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 exceptas 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 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 toan 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 dateestablished 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 Timeshall 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 containedin 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 andmaterials 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 bythe 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 todetermine 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.
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Incomplete items will be billed on the percent of work accomplished and a retainage of five percent (5%) of-2. 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 toby 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 writingconcerning 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 submita list to the Owner as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not beunreasonably 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 ofa 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 afinal 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 anddelivered 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 toexpire 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 maybe compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

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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 awaiver 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 withinthe 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.

PROTECTION OF PERSONS AND PROPERTY ARTICLE 10 § 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:

- employees on the Work and other persons who may be affected thereby; .1
- .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
- other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, .3 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 tothe 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 designatedby 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 constructionpractice, 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 accidentshall 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 madeuntil Contractor certifies that all injuries related to this Contract have been reported to the Construction Manager andfurther 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, butwhich 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 safelydespite 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 form 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 notpermit 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 complywith 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, andthe 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 transportany 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 tobe 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.

INSURANCE AND BONDS ARTICLE 11 § 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

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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 actionbefore 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 workunless 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 ifrequired by law:

Worker's Compensation:

- (a) State: Statutory
- (b) Applicable Federal (e.g., Longshoremen's): Statutory
- Employer's Liability: (c) \$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.

Contractors Commercial General Liability Insurance and Automobile Liability Insurance § 11.3

§ 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 decreasethe 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 ofits 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 employedby 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 anvequipment 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 bythe Owner." The coverage afforded under any insurance policy obtained under or pursuant to this Paragraph 11 shallbe 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 underthe services provided by the Contractor, the amount of excess of such claims, or any portion thereof, may be withheldfrom 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 tobe incorporated therein (subject to normal exclusions), on a replacement cost basis. Such insurance does not apply tothe 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 thecare, custody and control of the Contractor or any tier Subcontractor and which is not a part of, or to be incorporatedinto, 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 forloss 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 waivetheir 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.

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§ 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 causetheir underwriters, if any, to waive rights of subrogation, against the Owner for loss or damage to the Project, and forloss or damage to, including loss of use of, all real and personal property which is not part of the Work or Project andwhich 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)

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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 expressedin 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 renewedand recommence.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

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§ 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

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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.
- Damage to or unusual wear to deterioration of material or equipment while being used normally iii. or as specified.
- Guaranteed work which does not meet Contract performance requirements iv. 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 he 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 fromthe 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 anassignment 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 memberof 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.

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§ 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 schedulingand 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
 - After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of .3 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 requirementsof 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 tohave 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 duringemployment 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, shallinclude 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 Aincluding 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 Awithout limitation or Abut not limitedto 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, asshall 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 Subcontractorof 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 daysshall clearly be understood to indicate calendar days.

TERMINATION OR SUSPENSION OF THE CONTRACT ARTICLE 14 § 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;
- an act of government, such as a declaration of national emergency which requires all Work to be .2 stopped;

(Paragraphs deleted) 14.1.2 §

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§ 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 withthe 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 asprovided 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 includedherein, without interruption or delay, because of such picket or other form of labor dispute, the Ownermay 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, suchlabor 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:

- that performance is, was or would have been so suspended, delayed or interrupted by another cause for .1 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.

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§ 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 remedyfor 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 CERTIFIATION OF NON-SEGREGATED **FACILITES**

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 workon 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, demolition or transferrates 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, acompliance 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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Lansdowne Elementary School New Construction PSCP#03.105.17 Bid Number- MBU-516-17

SECTION 008000 - 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.
- 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..."

Lansdowne Elementary School New Construction PSCP#03.105.17 Bid Number- MBU-516-17

- 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 12 UNCOVERING AND CORRECTION OF WORK
- 12.2.2.1 Delete "...one (1) year..." Insert "...two (2) years..."

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.

SECTION 008500 - 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)



Naryland Division of Labor & Industry

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

11/10/2016

REQUEST FOR ADVERTISEMENT AND NOTICE TO PROCEED

Melvin Burley - Procurement Officer Baltimore County Public Schols 6901 N Charles Street, Building E Towson, MD 21204

Re: NEW SCHOOL CONSTRUCTION - LANDSDOWNE ELEMENTARY SCHOOL

Project No: MBU-516-17

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 <u>https://www.dllr.state.md.us/prevwage</u> 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 Goverment 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 <u>Maryland Register</u>.

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 <u>prevailingwage@dllr.state.md.us</u> 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 Traning 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:	Melvin Burley - Procurement Officer				
Department, Agency or Bureau:	Baltimore County Public Schols				
Project Number	690 TN Chanes Street, Building E Towson, MD 21204				
MBU-516-17	Location and Description of work:				
	Baltimore County: NEW SCHOOL CONSTRUCTION AND DEMOLITION				
Determination Number	OF EXISTING SCHOOL				
31898					

Date of Issue: Nov 10, 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
PILEDRIVER	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

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	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	
LAE	SORER 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	
LAE	ORERS 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 008900 - PERMITS, APPLICATIONS AND FEES

PART I – GENERAL

The Contractor shall obtain and pay for any and all permits, certificates of inspection, applications, etc. required by the Maryland Department of the Environment, and all other authorities having jurisdiction over the work being performed under this Contract. It shall be the responsibility of the Contractor to obtain, complete and submit all required forms and pay all cost associated with same.

The attached forms are for the convenience of the Contractor. Additional forms may be required

PART II – PRODUCTS (Not Applicable)

PART III – EXECUTION (Not Applicable)

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- C-9.1 FOREST CONSERVATION PLAN
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END OF SECTION 009000

SECTION 00903 – Capital Equipment Informational Prices

The apparent low bidder shall provide prices for all items listed below within 48 hours after Bid Opening. Prices will be reviewed by the Interagency Committee on School Construction of the State of Maryland and must be approved before construction begins. These prices will not affect the awarding of the project.

ITEM I.D.	DESCRIPTION	PRICE PER	QUANTITY	TOTAL COST
		UNIT		
General Furnishing	g Schedule and Metal Shelving	Schedule (Sheets A-9.1A thru	A-9.2D)
G5	Teacher's Wardrobe			
Α	Metal Shelving			
В	Metal Shelving			
С	Metal Shelving			
D	Metal Shelving			
Е	Metal Shelving			
F	Metal Shelving			
Equipment Schedu	le			
E1	Range			
E2	Hood			
E3	Under Counter Refrigerator			
E4	Refrigerator			
E5	Dishwater			
Kitchen Equipmen	t Schedule			
1	Food Transport Cart			
5	Shelving, Mobile			
6	Shelving			
7	Dunnage Rack, Mobile			
11	Ice Cream Cabinet, Mobile			
13	Pot and Pan Shelving, Mobile			
15	Worktable			
17	Convection Oven			
18	Pan Rack Cart, Mobile			
19	Pass-Thru refrigerator, Mobile			
21	Pass-Thru Warming Cabinet, Mobile			
22	Milk Cooler, Mobile			
23.d.	Cashier Stand			

25	Cash Register		
26	Condiment Counter, Mobile		
28	Bulk Milk Cooler, Mobile		
Specification Items			
101101	Display and Poster Cases		
102123	Health Room Cubicle Curtains		
115313	Platform Curtains and Tracks		
116623	Safety Pads		
122113	Horizontal Louver Blinds		
122413	Window Shade Systems		

SECTION 01 10 00 - SUMMARY

PART 1 GENERAL

1.1 PROJECT

- A. Project Name: Landsdowne Elementary School; 2301 Alma Road, Baltimore, Maryland.
- B. Owner's Name: Baltimore County Public Schools.
- C. The Project consists of the demolition of an existing school and construction of a new elementary school.
- 1.2 CONTRACT DESCRIPTION
 - A. Contract Type: A single prime contract based on a Stipulated Price as described in the Agreement.
- 1.3 OWNER OCCUPANCY
 - A. Owner intends to occupy the Project upon Substantial Completion.
 - B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
 - C. Schedule the Work to accommodate Owner occupancy.
- 1.4 CONTRACTOR USE OF SITE AND PREMISES
 - A. Construction Operations: Limited to areas noted on Drawings.
 - B. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.

1.5 COORDINATION

- A. Web-based Project Management Software:
 - 1. RFIs, project submittals and contractor change proposals will be submitted, managed and responded to through a web-based solution for construction administration.
 - 2. The Owner and Architect have selected Submittal Exchange as the web-based solution for this Project. Refer to www.submittalexchange.com for additional information on the service.
 - 3. The Contractor is required to use this service that will be provided by the Owner.
 - 4. Additional PDF mark-up software may be required for electronic processing.
 - 5. Provide a project record CD or DVD containing all data managed through the web-based project management software, at the conclusion of the Project.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.2 SCHEDULE OF VALUES

- A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- B. Forms filled out by hand will not be accepted.
- C. Submit a printed schedule on AIA Form G703 Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
- D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance.
 - 1. Identify site mobilization and bonds and insurance.
 - 2. Include additional line items identified by subsection titles, for Work exceeding \$15,000.
- F. Revise schedule to list approved Change Orders, with each Application For Payment.

1.3 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Present required information in typewritten form.
- E. Form: AIA G702 Application and Certificate for Payment and AIA G703 Continuation Sheet including continuation sheets when required.
- F. Execute certification by signature of authorized officer.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed .
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- I. Submit three copies of each Application for Payment.
- J. Include the following with the application:
 - 1. Transmittal letter as specified for Submittals in Section 01 30 00.
 - 2. Construction progress schedule, revised and current as specified in Section 01 32 16.
 - 3. Current construction photographs specified in Section 01 30 00.

- 4. Partial release of liens from major Subcontractors and vendors.
- 5. Sustainable design documentation applicable to work for which application is being made; see Section 01 35 16.
- 6. LEED submittals applicable to work for which application is being made; see Section 01 35 16.
- K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.
- L. Clearly indicate on the Application for Payment those line items which include materials or equipment, purchased or fabricated and stored, but not yet installed.
 - 1. Differentiate between items stored on-site and items stored off-site.
 - 2. Payments for material and equipment stored off-site will be at the sole discretion of the Owner. If required, Contractor will be responsible for all costs of travel and lodging for Architect, Engineers, and Owner to off-site storage locations to examine these items and the conditions of storage.
 - 3. For items stored off-site, provide a bill of sale from supplier/Trade Contractors and certificates of insurance for the full value of stored materials with the Owner named as the insured.
 - 4. For items stored off-site show a separate line item for the value of delivering and unloading the items at the Project site.
 - 5. For items stored on or off-site, provide in a separate line item for the value of the installation of these items.
- M. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. Staff names and assignments.
 - 3. Schedule of Values.
 - 4. Contractor's Construction Schedule (preliminary if not final).
 - 5. Products list.
 - 6. Schedule of unit prices.
 - 7. Submittals Schedule (preliminary if not final).
 - 8. Copies of building permits.
 - 9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 10. Initial progress report.
 - 11. Certificates of insurance and insurance policies.
 - 12. Performance and payment bonds.
 - 13. Data needed to acquire Owner's insurance.
- N. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

1.4 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.
- B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.
- C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 - 2. Promptly execute the change.
- D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 7 days.
- E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation .
- F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 - 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 - 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 - 3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
 - 4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- G. Substantiation of Costs: Provide full information required for evaluation.
 - 1. On request, provide following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Credit for deletions from Contract, similarly documented.
 - 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 - 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

- I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- J. Promptly enter changes in Project Record Documents.

1.5 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 70 00, Section 01 77 00 and Section 01 78 00.
 - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - 3. Updated final statement, accounting for final changes to the Contract Sum.
 - 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 - 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 - 6. AIA Document G707, "Consent of Surety to Final Payment."
 - 7. Evidence that claims have been settled.
 - 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 - 9. Final, liquidated damages settlement statement.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 21 00 - ALLOWANCES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cash allowances.
- B. Quantity allowances.
- C. Payment and modification procedures relating to allowances.

1.2 RELATED REQUIREMENTS

A. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.

1.3 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts, less cost of delivery to site, less applicable taxes.
- B. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; and labor for installation and finishing.
- C. Architect Responsibilities:
 - 1. Select products in consultation with Owner and transmit decision to Contractor.
 - 2. Prepare Change Order.
- D. Contractor Responsibilities:
 - 1. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
 - 2. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 - 3. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- E. Differences in costs will be adjusted by Change Order.

1.4 QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner, in the specified quantity.
- B. Costs Included in Quantity Allowances: Cost of components or equipment to Contractor or subcontractor, less applicable trade discounts, including cost of delivery to site and applicable taxes.
- C. Where specifically indicated, include in the allowance the labor required to install products, materials, and equipment provided under the allowance. Note: By definition, statements requiring the Contractor to 'provide' a quantity of work includes labor.
 - 1. Allowances including labor to also include Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, uncrating and storage, protection from the elements and damage, and similar costs related to products and materials.
 - 2. Differences in quantities used will be adjusted by Change Order on an unit cost basis.
- D. Where labor is not specifically indicated to be included within the quantity allowance, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, uncrating and storage, protection from the elements and damage, and similar costs

related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

- 1.5 ALLOWANCES SCHEDULE
 - A. Food Services Signage: Provide an allowance of \$12,000 for food services signage.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 22 00 - UNIT PRICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Measurement and payment criteria applicable to Work performed under a unit price payment method.
- B. The scope of work under this contract consists of BASE BID and Add Alternates 1-10. Base Bid consists of PART A and PART B. PART A consists of Lump Sum Item for all work specified on plans and/or specifications. PART B consists of Unit Price Items specified in Section 004000 (Unit Price Items does not include work specified on plans and/or specifications).

1.2 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.3 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- 1.4 PAYMENT
 - A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- 1.5 SCHEDULE OF UNIT PRICES
 - A. Unit Price No. 1 Riprap Class 1:
 - 1. Description: Furnish and install riprap Class 1
 - 2. Unit of Measurement: Ton
 - 3. Price per Unit of Measurement: \$50.00
 - B. Unit Price No. 2 Earth Excavation Onsite:
 - 1. Description: Earth excavation-machine and disposal onsite
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$3.00
 - C. Unit Price No. 3 Earth Excavation Offsite:
 - 1. Description: Earth excavation-machine and disposal offsite
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$16.00
 - D. Unit Price No. 4 Earth Excavation Onsite:
 - 1. Description: Earth excavation-hand and disposal onsite
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$90.00

- E. Unit Price No. 5 Earth Excavation Offsite:
 - 1. Description: Earth excavation-hand and disposal offsite
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$100.00
- F. Unit Price No. 6 Trench Excavation Onsite:
 - 1. Description: Trench excavation and soil disposal onsite
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$9.00
- G. Unit Price No. 7 Trench Excavation Offsite:
 - 1. Description: Trench excavation and soil disposal offsite
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$20.00
- H. Unit Price No. 8 Contaminated Soil:
 - 1. Description: Excavate and legally dispose offsite petroleum contaminated soil
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$245.00
- I. Unit Price No. 9 MSHA #2 or #57 stone at trench areas:
 - 1. Description: Undercut, dispose onsite, refill with MSHA #2 or #57 stone and compact per specified requirements at trench areas only
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$37.40
- J. Unit Price No. 10 CR-6 or CR-1 at trench areas:
 - 1. Description: Undercut, dispose onsite, refill with CR-6 or CR-1 and compact per specified requirements at trench areas only
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$41.80
- K. Unit Price No. 11 MSHA #2 or #57 stone in open areas:
 - 1. Description: Undercut, dispose offsite, refill with MSHA #2 or #57 stone and compact per specified requirements in open areas only
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$45.00
- L. L. Unit Price No. 12 CR-6 or CR-1 in open areas:
 - 1. Description: Undercut, dispose offsite, refill with CR-6 or CR-1 and compact per specified requirements in open areas only
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$54.00
- M. Unit Price No. 13 Imported Screened Topsoil:
 - 1. Description: Imported screened topsoil and fine graded in place no material larger than $\frac{3}{4}$ " in mix
 - 2. Unit of Measurement: Cubic yard
 - 3. Price per Unit of Measurement: \$30.00
- N. Unit Price No. 14 Sodding:
 - 1. Description: Sodding
 - 2. Unit of Measurement: Square yard
 - 3. Price per Unit of Measurement: \$4.25
- O. Unit Price No. 15 Permanent Seeding and Mulch:
- 1. Description: Permanent seeding and mulch
- 2. Unit of Measurement: Square yard
- 3. Price per Unit of Measurement: \$0.70
- P. Unit Price No. 16 Temporary Seeding and Straw:
 - 1. Description: Temporary seeding and straw
 - 2. Unit of Measurement: Square yard
 - 3. Price per Unit of Measurement: \$0.35
- Q. Unit Price No. 17 Mirafi 500x:
 - 1. Description: Furnish and install Mirafi 500x or equal
 - 2. Unit of Measurement: Square yard
 - 3. Price per Unit of Measurement: \$1.30
- R. Unit Price No. 18 Stabilization Fabric:
 - 1. Description: Furnish and install stabilization fabric Mirafi 160n or equal
 - 2. Unit of Measurement: Square yard
 - 3. Price per Unit of Measurement: \$1.60
- S. Unit Price No. 19 Stabilization Fabric and Filter Cloth:
 - 1. Description: Furnish and install Mirafi 500x or equal stabilization fabric, MSHA #2 stone 2' deep, and Mirafi 160n or equal filter cloth
 - 2. Unit of Measurement: Square yard
 - 3. Price per Unit of Measurement: \$32.00
- T. Unit Price No. 20 MSHA #2 Stone:
 - 1. Description: Furnish and install MSHA #2 stone
 - 2. Unit of Measurement: Ton
 - 3. Price per Unit of Measurement: \$20.90
- U. Unit Price No. 21 Super Silt Fence:
 - 1. Description: Furnish, install, maintain, and remove super silt fence and grade/restabilize
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$12.00
- V. Unit Price No. 22 Silt Fence:
 - 1. Description: Furnish, install, maintain, and remove silt fence and grade/restabilize
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$4.50
- W. Unit Price No. 23 Leafgro:
 - 1. Description: Furnish and install "Leafgro" or equal to amend topsoil to specified organic content. Quantity based on amount of amendment used.
 - 2. Unit of Measurement: Cubic Yard
 - 3. Price per Unit of Measurement: \$30.00
- X. Unit Price No. 24 Soil Cement:
 - 1. Description: Furnish and install 5% soil cement 1' deep
 - 2. Unit of Measurement: Square Yard
 - 3. Price per Unit of Measurement: \$8.75
- Y. Unit Price No. 25 Hydrated Lime:
 - 1. Description: Furnish and install 6% hydrated lime 1' deep
 - 2. Unit of Measurement: Square Yard
 - 3. Price per Unit of Measurement: \$8.25
- Z. Unit Price No. 26 Erosion Control Matting:

- 1. Description: Furnish and install erosion control matting
- 2. Unit of Measurement: Square Yard
- 3. Price per Unit of Measurement: \$2.00
- AA. Unit Price No. 27 A-2 Type Dike and Incidentals:
 - 1. Description: Install and remove A-2 type dike and incidentals
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$5.45
- AB. Unit Price No. 28 Trench Rock:
 - 1. Description: Remove trench rock haul and dispose of legally offsite
 - 2. Unit of Measurement: Cubic Yard
 - 3. Price per Unit of Measurement: \$150.00
- AC. Unit Price No. 28 Open Rock:
 - 1. Description: Remove open rock, haul and dispose of legally offsite
 - 2. Unit of Measurement: Cubic Yard
 - 3. Price per Unit of Measurement: \$75.00
- AD. Unit Price No. 30 Existing Sidewalk and Spoil:
 - 1. Description: Removal of existing sidewalk and spoil as necessary, dispose of legally offsite, install new 5" sidewalk with W20 x 20 mesh.
 - 2. Unit of Measurement: Square Foot
 - 3. Price per Unit of Measurement: \$8.50
- AE. Unit Price No. 31 Existing Curb and Gutter:
 - 1. Description: Saw, cut and removal of existing curb and gutter and dispose of legally offsite, install new curb and gutter to match existing.
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$23.00
- AF. Unit Price No. 32 CR-6, #2 stone, or #57 stone:
 - 1. Description: Import CR-6, #2 stone, or #57 stone and compact in place to 98%.
 - 2. Unit of Measurement: Ton
 - 3. Price per Unit of Measurement: \$23.00
- AG. Unit Price No. 33 Damaged Paving:
 - 1. Description: Saw, cut and remove damaged paving, dispose of legally offsite, replace with 4" base course and $1-\frac{1}{2}$ " surface course.
 - 2. Unit of Measurement: Square Yard
 - 3. Price per Unit of Measurement: \$40.00
- AH. Unit Price No. 34- Concrete curb and gutter:
 - 1. Description: Concrete curb and gutter
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$14.18
- AI. Unit Price No. 35 Concrete Slab:
 - 1. Description: Labor, equipment, material, and mark-up to repair out of tolerance or defective concrete slab.
 - 2. Unit of Measurement: Square Foot
 - 3. Price per Unit of Measurement: \$0.60
- AJ. Unit Price No. 36 4" CMU wall:

- 1. Description: Unit masonry per Sq/ft of wall surface includes mortar/joint reinforcement, bull nose corners, labor, scaffold, and all incidentals. This price does not include grout infill. CMU units to be regular hollow for purpose of unit price.
- 2. Unit of Measurement: Square Foot
- 3. Price per Unit of Measurement: \$10.34
- AK. Unit Price No. 37 6" CMU wall:
 - 1. Description: Unit masonry per Sq/ft of wall surface includes mortar/joint reinforcement, bull nose corners, labor, scaffold, and all incidentals. This price does not include grout infill. CMU units to be regular hollow for purpose of unit price.
 - 2. Unit of Measurement: Square Foot
 - 3. Price per Unit of Measurement: \$10.77
- AL. Unit Price No. 38 8" CMU wall:
 - 1. Description: Unit masonry per Sq/ft of wall surface includes mortar/joint reinforcement, bull nose corners, labor, scaffold, and all incidentals. This price does not include grout infill. CMU units to be regular hollow for purpose of unit price.
 - 2. Unit of Measurement: Square Foot
 - 3. Price per Unit of Measurement: \$11.20

AM.Unit Price No. 39 - 12" CMU wall:

- 1. Description: Unit masonry per Sq/ft of wall surface includes mortar/joint reinforcement, bull nose corners, labor, scaffold, and all incidentals. This price does not include grout infill. CMU units to be regular hollow for purpose of unit price.
- 2. Unit of Measurement: Square Foot
- 3. Price per Unit of Measurement: \$11.95
- AN. Unit Price No. 40 Tooth single doorframe
 - 1. Description: Furnish and install extra CMU lintel as necessary and infill. Grout CMU and frame after frames is set.
 - 2. Unit of Measurement: Per opening
 - 3. Price per Unit of Measurement: \$800.00
- AO. Unit Price No. 41 Tooth double doorframe:
 - 1. Description: Furnish and install extra CMU lintel as necessary and infill. Grout CMU and frame after frame is set.
 - 2. Unit of Measurement: Per opening
 - 3. Price per Unit of Measurement: \$900.00
- AP. Unit Price No. 42 Receptacle:
 - 1. Description: Provide 120-volt, 20-Ampere (NEMA.5-20R) receptacle, and 100--Ln/ft 2# 12 and 12G in ³/₄" conduit, and other materials as needed for a complete receptacle addition.
 - 2. Unit of Measurement: Per location
 - 3. Price per Unit of Measurement: \$536.00
- AQ. Unit Price No. 43 Fire Alarm Strobe:
 - 1. Description: Provide 15, 30, 60, 75, or 110-CD ceiling or wall-mounted strobe and 50-Ln/ft of 14 AWG THWN stranded fire alarm cabling in ³/₄" conduit minimum. Provide all programming and testing.
 - 2. Unit of Measurement: Per location
 - 3. Price per Unit of Measurement: \$380.00
- AR. Unit Price No. 44 Fire Alarm Horn or Speaker/Strobe Unit:

- 1. Description: Provide 15, 30, 60, 75, or 110-CD ceiling or wall-mounted fire alarm horns, horn/strobes, or speaker/strobes and 50-Ln/ft of 14 AWG THWN stranded fire alarm cabling in ³/₄" conduit minimum. Provide all programming and testing.
- 2. Unit of Measurement: Per location
- 3. Price per Unit of Measurement: \$464.00
- AX. Unit Price No. 45 Data Outlet:
 - 1. Description: Provide 300-Ln/ft of CAT-6 cabling and CAT-6 RJ-45 jack and faceplate and back box. Provide all terminations, testing, and labeling.
 - 2. Unit of Measurement: Per location
 - 3. Price per Unit of Measurement: \$255.00
- AY. Unit Price No. 46 Exit Sign:
 - 1. Description: Provide exit light with wire guards and 50-Ft. of conduit and wire Fixture Type X.
 - 2. Unit of Measurement: Each
 - 3. Price per Unit of Measurement: \$418.00
- AZ. Unit Price No. 47 Light Switch:
 - 1. Description: Provide 1P, 20A toggle switch including box, cover plate, and 50-Ft. of conduit and wiring.
 - 2. Unit of Measurement: Each
 - 3. Price per Unit of Measurement: \$275.00
- BA. Unit Price No. 48 Telephone Drop:
 - 1. Description: Provide a Cat 5 E telephone jack complete with testing and termination. Include 300 ft. of Cat 5 E plenum cable.
 - 2. Unit of Measurement: Each
 - 3. Price per Unit of Measurement: \$236.00
- BB. Unit Price No. 49 Video Drop:
 - 1. Description: Provide video jack and plates as specified complete with testing, termination and labeling. Include 50-Ft. of RG-6/U coaxial plenum cable and video tap.
 - 2. Unit of Measurement: Each
 - 3. Price per Unit of Measurement: \$120.00
- BC. Unit Price No. 50 Speaker:
 - 1. Description: Provide PA system ceiling-mounted speaker including back box, 200-Ft. of cabling in ³/₄" conduit and programming.
 - 2. Unit of Measurement: Each
 - 3. Price per Unit of Measurement: \$943.00
- BD. Unit Price No. 51 Fire Alarm Pull Station:
 - 1. Description: Provide a manual fire alarm pull station complete with 200-Ft. of 14 AWG THWN stranded fire alarm wiring in ³/₄" conduit minimum. Provide all programming and testing.
 - 2. Unit of Measurement: Each
 - 3. Price per Unit of Measurement: \$389.00
- BE. Unit Price No. 52 Concrete Sidewalk:
 - 1. Description: 6 inch thick concrete sidewalk on top of 4" aggregate.
 - 2. Unit of Measurement: Square Foot
 - 3. Price per Unit of Measurement: \$7.00
- BG. Unit Price No. 54- Heavy Duty Paving:

- 1. Description: Heavy Duty Bituminous Paving consisting of one 2 inch layer and one 4 inch layer of paving on top of 12 inches of aggregate.
- 2. Unit of Measurement: Square Yard
- 3. Price per Unit of Measurement: \$42.00
- BH. Unit Price No. 55 Aggregate Piers:
 - 1. Description: Aggregate pier with 6,000 pound per square foot of capacity.
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$52.00
- BI. Unit Price No. 56 Imported Fill Material:
 - 1. Description: Furnish, deliver, spread, and compact imported fill material.
 - 2. Unit of Measurement: Cubic Yard
 - 3. Price per Unit of Measurement: \$37.00
- BJ. Unit Price No. 57 Unsuitable Material:
 - 1. Description: Excavation and removal of unsuitable material.
 - 2. Unit of Measurement: Cubic Yard
 - 3. Price per Unit of Measurement: \$26.00
- BK. Unit Price No. 58 Reinforced Concrete Footing:
 - 1. Description: Reinforced Concrete Footing.
 - 2. Unit of Measurement: Cubic Yard
 - 3. Price per Unit of Measurement: \$475.00
- BL. Unit Price No. 59 Not Used.
- BM. Unit Price No. 60 Diversion Fence:
 - 1. Description: Furnish, install, maintain, and remove diversion fence and grade/restabilize
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$11.50
- BN. Unit Price No. 61 Blaze Orange Fence (Tree Protection):
 - 1. Description: Furnish, install, maintain, and remove blaze orange fence and grade/restabilize
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$9.50
- BO. Unit Price No. 62 Bituminous Sidewalk:
 - 1. Description: 3 inch thick bituminous sidewalk on top of 4" aggregate.
 - 2. Unit of Measurement: Square Foot
 - 3. Price per Unit of Measurement: \$6.00
- BP. Unit Price No. 63 B-2 Type Dike and Incidentals:
 - 1. Description: Install and remove B-2 type dike and incidentals
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$13.75
- BQ. Unit Price No. 64 Asphalt Berm:
 - 1. Description: Install and remove asphalt berm and grade/stabilize
 - 2. Unit of Measurement: Linear Foot
 - 3. Price per Unit of Measurement: \$35.50
- BR. Unit Price No. 65 Sign Post:
 - 1. Description: Furnish and install sign post (2-inch square steel)
 - 2. Unit of Measurement: Each
 - 3. Price per Unit of Measurement: \$75.00

BS. Unit Price No. 66 – Sign:

- 1. Description: Furnish and install sign
- 2. Unit of Measurement: Square Foot
- 3. Price per Unit of Measurement: \$50.00
- BT. Unit Price No. 67 Temporary Paving:
 - 1. Description: Temporary Bituminous Paving consisting of one $1\frac{1}{2}$ inch layer and one $2\frac{1}{2}$ inch layer of paving on top of 4 inches of aggregate.
 - 2. Unit of Measurement: Square Yard
 - 3. Price per Unit of Measurement: \$29.00

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 23 00 - ALTERNATE BIDS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Description of Alternates.
- B. Administrative and procedural requirements for Alternate Bids.

1.2 **DEFINITIONS**

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.
 - 2. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate. Include costs of related coordination, modification, or adjustment.

1.3 ACCEPTANCE OF ALTERNATE BIDS

- A. Alternate Bids quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternate Bids will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each alternate.

1.4 SCHEDULE OF ALTERNATE BIDS

- A. ALTERNATE No. 1
 - 1. ALTERNATE: Provide concrete benches at outdoor learning area and colored concrete sidewalk as specified and detailed on drawings.
 - 2. BASE BID: Provide no benches at outdoor learning area and typical concrete sidewalks with no color.
- B. ALTERNATE No. 2
 - 1. ALTERNATE: Provide fabric wrapped acoustical panels at gymnasium as specified and detailed on drawings.
 - 2. BASE BID: Provide cementitious wood fiberboard acoustic panels at gymnasium as specified and detailed on drawings.
- C. ALTERNATE No. 3
 - 1. ALTERNATE: Provide PV panels and supports, and electronic dashboard connected to solar panels as specified and detailed on drawings.
 - 2. BASE BID: Provide empty conduit only for solar panels infrastructure as specified and detailed on drawings.
- D. ALTERNATE No. 4
 - 1. ALTERNATE: Provide rain barrel with setting block and downspout diverter at green roof terrace as specified and detailed on drawings.
 - 2. BASE BID: Provide downspout with and splashblock as specified and detailed on the drawings.
- E. ALTERNATE No. 5

- 1. ALTERNATE: Provide rooftop equipment screens as specified and detailed on drawings.
- 2. BASE BID: Provide no rooftop equipment screens.
- F. ALTERNATE No. 6
 - 1. ALTERNATE: Provide digital and masonry site sign as specified and detailed on drawings.
 - 2. BASE BID: Provide masonry site sign as specified and detailed on drawings.
- G. ALTERNATE No. 7
 - 1. ALTERNATE: Provide Provide concrete sidewalk from paved play to dead end at Zion Rd. as specified and detailed on drawings.
 - 2. BASE BID: Provide bituminous paving as specified and detailed on drawings.
- H. ALTERNATE No. 8
 - 1. ALTERNATE: Provide reinforced concrete storm drain pipe as specified and detailed on drawings.
 - 2. BASE BID: Provide HDPE storm drain pipe as specified and detailed on drawings.
- I. ALTERNATE No. 9
 - 1. ALTERNATE: Provide metal fence at Kindergarten play area as specified and detailed on the drawings.
 - 2. BASE BID: Provide PVC coated chain link fencing at play area as specified and detailed on drawings.
- J. ALTERNATE No. 10
 - 1. ALTERNATE: Provide quartz tile as specified and detailed on drawings.
 - 2. BASE BID: Provide VCT as specified and detailed on drawings.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project coordination.
- B. Requests for interpretation (RFI).
- C. Subcontract list.
- D. Staff names and assignments.
- E. Preconstruction meeting.
- F. Progress meetings.
- G. Progress photographs.
- H. Submittals for review, information, and project closeout.
- I. Number of copies of submittals.
- J. Submittal procedures.
- K. Contractor's use of Architect's CAD files.
- L. Delegated design.
- M. Contractor's review.
- N. Architect's action.
- O. Daily construction reports.

1.2 PROJECT COORDINATION

- A. Project Coordinator: General Contractor.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for vehicle and truck access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Closeout submittals.

1.3 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
 - 1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
 - 3. Frivolous RFIs: The Contractor will compensate the Owner for the Architect's time and expenses to process RFIs resulting from the Contractor's lack of studying and comparing the Contract Documents, coordinating their own Work, or repeating previous RFIs.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
 - 1. Project name.
 - 2. Date.
 - 3. Name of Contractor.
 - 4. Name of Architect.
 - 5. RFI number, numbered sequentially.
 - 6. Specification Section number and title and related paragraphs, as appropriate.
 - 7. Drawing number and detail references, as appropriate.
 - 8. Field dimensions and conditions, as appropriate.
 - 9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 10. Contractor's signature.
 - 11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
 - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Format of RFIs: Content provided by CSI Form 13.2.A, as provided at end of this Section.
 - 1. Software-Generated RFIs:
 - a. Preferred format.
 - b. Software-generated form with substantially the same content as indicated above.
 - c. Photographs shall be electronic files in JPG format.
 - d. Attachments shall be electronic files in Adobe Acrobat PDF format.
 - 2. Hard-Copy RFIs:
 - a. Permitted under conditions where electronic RFI is not feasible.
 - b. Identify each page of attachments with the RFI number and sequential page number.
- D. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
 - 1. The following RFIs may be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.

- f. Incomplete RFIs or RFIs with numerous errors.
- 2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
- 3. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, submit Change Order Request within 10 days of receipt of the RFI response as provided by General Conditions of the Contract.
- E. Architect's Action: Architect will review each RFI, determine action required, and respond through the Web-based Project Management Software. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
 - 1. The following RFIs may be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or RFIs with numerous errors.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
 - 3. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, submit Change Order Request within 10 days of receipt of the RFI response as provided by General Conditions of the Contract.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- G. On receipt of Architect's action, immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- H. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were dropped and not submitted.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's response was received.
 - 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
- I. RFI Log: Prepared and maintained by the Architect within the Web-based Project Management Software; Contractor to maintain a separate RFI log with subcontractors.

1.4 SUBCONTRACT LIST

- A. Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.

- 2. Number and title of related Specification Section(s) covered by subcontract.
- 3. Drawing number and detail references, as appropriate, covered by subcontract.
- 4. Number of Copies: Submit four copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
 - a. Mark up and retain one returned copy as a Project Record Document.

1.5 STAFF NAMES AND ASSIGNMENTS

- A. Submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site, prior to or coinciding with initial Application for Payment.
- B. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.
- C. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
- D. Post copies of list in Project meeting room, in temporary field office, and by each temporary phone.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
 - 5. Designation of personnel representing the parties to Contract, _____ and Architect.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 7. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.2 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum bi-weekly intervals.
- B. Architect will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Contractor's project manager and job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.

D. Agenda:

- 1. Review minutes of previous meetings.
- 2. Review of Work progress.
- 3. Field observations, problems, and decisions.
- 4. Identification of problems that impede, or will impede, planned progress.
- 5. Review of submittals schedule and status of submittals.
- 6. Review of off-site fabrication and delivery schedules.
- 7. Maintenance of progress schedule.
- 8. Corrective measures to regain projected schedules.
- 9. Planned progress during succeeding work period.
- 10. Maintenance of quality and work standards.
- 11. Effect of proposed changes on progress schedule and coordination.
- 12. LEED requirements and documentation progess.
- 13. Other business relating to Work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.3 PROGRESS PHOTOGRAPHS

- A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
- B. Photography Type: Digital; electronic files.
- C. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Architect.
- D. In addition to periodic, recurring views, take photographs of each of the following events:
 - 1. Excavations in progress.
 - 2. Foundations in progress and upon completion.
 - 3. Structural framing in progress and upon completion.
 - 4. Enclosure of building, upon completion.
 - 5. Final completion, minimum of ten (10) photos.
- E. Views:
 - 1. Provide non-aerial photographs from four cardinal views at each specified time, until Date of Substantial Completion.
 - 2. Consult with Architect for instructions on views required.
 - 3. Provide factual presentation.
 - 4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- F. Digital Photographs: 24 bit color, minimum resolution of 1600 by 1200 ("2 megapixel"), in JPG format; provide files unaltered by photo editing software.
 - 1. Delivery Medium: Web-based Project Management Software.
 - 2. File Naming: Include project identification, date and time of view, and view identification.
 - 3. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.
- G. Additional Photographic Requirements: Refer to Section 01734 for photographic documentation requirements for Indoor Air Quality Controls.

3.4 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
 - 5. LEED submittals and reports.
- B. Package these submittals by specification section, except closeout submittals or Work performed by separate trades, in a single delivery to the Architect; failure of the Contractor to package these submittals in a single delivery may cause the Architect to withhold action on submittal until associated submittals required by the particular specification section are received.
 - 1. LEED Submittal and LEED Report data required by the Contract Documents and the LEED Certification process to be assembled separately from other submittal types and organized as the first items in any package of submittals; do not rely on the Architect or LEED consultant discovering the required data within product data or any other sort of submittal.
- C. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- D. Product data and shop drawings to be submitted and managed through the Web-based Project Management Software.
- E. Samples will be reviewed only for aesthetic, color, or finish selection.
- F. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01780 CLOSEOUT SUBMITTALS.

3.5 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Daily construction reports.
 - 8. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.
- C. Informational submittals to be submitted and managed through the Web-based Project Management Software.

3.6 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.

- 4. Bonds.
- 5. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

3.7 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.8 SUBMITTAL PROCEDURES

- A. Submittals not requested will not be recognized or processed.
- B. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 21 days for initial review of each submittal; duration of time is defined by date received in Architect's office until the day sent from the Architect's office. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal; duration of time is defined by date received in Architect's office until the day sent from the Architect's office.
 - 4. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal; duration of time is defined by date received in consultant's office until the day sent to the Contractor. Submittals required within the following divisions to be sent directly to the Architect's consultants:
 - a. All required submittals indicated in Division 3 section.
 - b. The following required submittals indicated in Division 4:
 - 1) Product data, shop drawings, material certificates, mix designs, and cold-weather procedures.
 - c. All required submittals indicated in the following Division 5 Sections:
 - 1) Structural Steel
 - 2) Steel Joists
 - 3) Steel Decking
 - 4) Cold-Formed Metal Framing
 - 5) Metal Stairs
 - 6) Railings and Handrails
 - 7) Metal Fabrications
 - d. All required submittals indicated in the following Division 8 Section:

- 1) Door Hardware
- 2) Curtainwall
- e. All required submittals for Food Service Equipment.
- f. All required submittals indicated in Mechanical Divisions 21 through 23 sections.
- g. All required submittals indicated in Division 26 sections.
- h. All required submittals indicated in Divisions 31 through 33 sections.
- 5. Color Selection: Architect will select colors within 60 days (to allow time for presentation to Owner and for Owner comments) after all color samples have been submitted including, but not limited to items listed below. The submittal data shall be complete, including shop drawings, product data, and color samples, and all required submittals and materials shall be in compliance with the specifications and be subsequently approved by the Architect. Color samples shall be actual samples of the material and not photographs. If there is a variation in color, shade, texture, or pattern, submit multiple samples to show full range of variation.
 - a. Interior Items (including but not limited to):
 - 1) Plastic laminate and millwork.
 - 2) Wood door veneer.
 - 3) Ceramic tile.
 - 4) Resilient floor tile.
 - 5) Resilient wall base and accessories.
 - 6) Resinous flooring.
 - 7) Carpet.
 - 8) Acoustical wall panels.
 - 9) Paint.
 - 10) High-performance coatings.
 - 11) Toilet compartments.
 - 12) Signs and cast letters.
 - 13) Casework veneer.
 - b. Prefinished Exterior Items (including but not limited to):
 - 1) Metal roofing.
 - 2) Copings, perimeter edge systems.
 - 3) Site furnishings and equipment.
- D. Submittal Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.

- 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
- 2) Number and title of appropriate Specification Section.
- 3) Drawing number and detail references, as appropriate.
- 4) Location(s) where product is to be installed, as appropriate.
- 5) Other necessary identification.
- E. Deviations: Encircle or otherwise specifically identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
 - 2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
 - 1. Transmittal Form: Use CSI Form 12.1A.
 - 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked "No Exception Taken" or "Note Markings".
 - 4. Resubmission of items rejected or marked "Revise and Resubmit" will be reviewed one time by the Architect at no cost to the Contractor. Should the re-submittal be rejected or marked "Revise and Resubmit", the Contractor will reimburse the Owner by credit Change Order for all costs to the Owner for additional time spent by the Architect and the Architect's consultants to review the second (and subsequent) resubmission.
- I. Resubmittals:
 - 1. Resubmit submittals until they are marked "No Exception Taken" or "Note Markings".
 - 2. Resubmission of items rejected or marked "Revise and Resubmit" will be reviewed one time by the Architect at no cost to the Contractor. Should the re-submittal be rejected or marked "Revise and Resubmit", the Contractor will reimburse the Owner by credit Change Order for all costs to the Owner for additional time spent by the Architect and the Architect's consultants to review the second (and subsequent) resubmission.
- J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- K. Use for Construction: Use only final submittals with mark indicating "No Exceptions Taken" or "Note Markings" taken by Architect.

3.9 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

- A. At Contractor's written request, copies of Architect's CAD Drawing files will be provided to Contractor for Contractor's use in connection with Project; Contractor must sign and return the release form at the end of this Section.
- B. Allow one week for processing, shipping and handling after Architect receives the signed form.
- C. Only the files indicated on Agreement included at the end of this Section shall be made available for use as backgrounds for preparation of shop drawings and coordination drawings. No other CAD Drawing files, for this Project, will be made available.

3.10 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

3.11 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect through the Web-based Project Management Software.
- C. Verify:
 - 1. Field Measurements.
 - 2. Field Construction Criteria.
 - 3. Catalog Numbers and Similar Data.
 - 4. Quantities.
- D. Contractor's responsibility regarding errors and omissions in submittals is not relieved by Architect's review of submittals.
- E. Contractor's responsibility regarding deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals, unless Architect gives written acceptance of specific deviations as approved by Owner.
- F. When work is directly related and involves more than one trade, coordinate submittal with other trades and submit under one cover.
- G. After a submittal has been submitted for review, no changes may be made to that Submittal other than changes resulting from review notes made by the Architect unless such changes are

clearly identified and circled before being resubmitted. Any failure to comply with this requirement shall nullify and invalidate the Architect's review.

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

THIS IS TO CERTIFY THAT THE SPECIFICATION REQUIREMENTS HAVE BEEN MET AND ALL DIMENSIONS, CONDITIONS, AND QUANTITIES ARE VERIFIED AS SHOWN AND/OR CORRECTED ON THESE DRAWINGS. SIGNED

3.12 ARCHITECT'S/ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it; except where indicated otherwise. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. NO EXCEPTION TAKEN: The Work covered by the submittal is accepted as specified and the Work may proceed provided it complies with requirements of the Contract Documents.
 - 2. NOTE MARKINGS: The Work covered by the submittal is accepted as noted and the Work may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.
 - 3. REVISE AND RESUBMIT: Do not proceed with the Work covered by the submittal. Revise or prepare a new submittal according to the notations and requirements of the Contract Documents, and resubmit without delay. Unmarked items may be fabricated if indicated.
 - 4. REJECTED: Architect will list reasons for rejection on the submittal or in the transmittal letter accompanying the submittal. Do not proceed with the Work covered by the submittal. Prepare new submittal according to the notations and requirements of the Contract Documents, and resubmit without delay.
 - 5. ACTION NOT REQUIRED: Either the submittal was not requested or the submittal was for information only or for record purposes.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.13 DAILY CONSTRUCTION REPORTS

- A. Prepare a daily construction report, recording the following information concerning events at the site.
 - 1. List of Trade Contractors at the site.

- 2. List of major items of equipment on site.
- 3. List of construction activities performed (for each trade).
- 4. Approximate count of personnel at the site for each trade.
- 5. High and low temperatures, general weather conditions.
- 6. Accidents and unusual events.
- 7. Meetings and significant decisions.
- 8. Stoppages, delays, shortages, losses.
- 9. Meter readings and similar recordings.
- 10. Emergency procedures.
- 11. Orders and requests of governing authorities.
- 12. Change Orders received, implemented.
- 13. Services connected, disconnected.
- 14. Equipment or systems tests and start-ups.
- 15. Partial Completions, occupancies.
- B. Duplicate copies of the daily construction reports shall accompany the progress report and be turned over to the Architect at the job conference.



REQUEST FOR INTERPRETATION

Project:		R.F.I. Number:	
		From:	
То:		Date:	
		A/E Project Number:	
Re:		Contract For:	
Specification Section:	Paragraph:	Drawing Reference:	Detail:
Request:			
Signed by:			Date:
Response:			
Attachments			
Response From:	To:	Date Rec'd:	Date Ret'd:
Signed by:			Date:
Copies: Owner	Consultants		[] [] File
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SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project:			From (Contractor):		
_			Date:		
To (A/E):			A/E Project Number	er:	
_			Contract For:		
List Subcontra	actors and Major Materia	l Suppliers proposed for use on th	his Project as required by the Construction Documer	nts. Attach supplemental sheets if necessary.	
Section	Section			Phone Number	
Number	Title	Firm	Address	(Fax Number) Contact	
Number	Title	Firm	Address	(Fax Number) Contact	
Number	Title	Firm	Address	(Fax Number) Contact	
Number	Title	Firm	Address	(Fax Number) Contact	

Attachments

Signed by:							Date:		
Copies: Owner	Consultants		□	□	□	□	□	□	🗌 File
© Copyright 1994, Constru	action SpecificationsInsti	tute,		Page	of				July 1994



SUBMITTAL TRANSMITTAL

Project:	Date:			
	A/E Project Number:			
TRANSMITTAL To (Contractor): A From (Subcontractor):	Date: By:	Submittal No.		
Qty. Reference / Title / Description / Number Manufacturer		Spec. Section Title and Paragraph Drawing Detail Reference		
 Submitted for review and approval Resubmitted for review and approval Complies with contract requirements Will be available to meet construction schedule A/E review time included in construction schedule 	☐ Substitutio ☐ If substituti comparativ ☐ Items inclu immediatel	n involved - Substitution request attached ion involved, submission includes point-by-point e data or preliminary details ded in submission will be ordered y upon receipt of approval		
ther remarks on above submission:		One copy retained by sender		
RANSMITTAL To (A/E): B From (Contractor):	Attn: By:	Date Rec'd by Contractor: Date Trnsmt'd by Contractor:		
Approved Approved as noted	Revise / R	esubmit Resubmit		
Other remarks on above submission:		One copy retained by sender		
TRANSMITTAL To (Contractor):	Attn:	Date Rec'd by A/E:		
C From (A/E): \Box Other	By:	Date Trnsmt'd by A/E:		
Approved Approved as noted	 Provide file copy with corrections identified Sepia copies only returned 			
No action required Revise / Resubmit Rejected / Resubmit	Point-by-point comparative data required to complete approval process			
Approved as noted / Resubmit	Submissio	n Incomplete / Resubmit		
Other remarks on above submission:		One copy retained by sender		
TRANSMITTAL To (Subcontractor):	Attn:	Date Rec'd by Contractor:		
From (Contractor):	By:	Date Trnsmt'd by Contractor:		
Copies: Owner Consultants		One copy retained by send		

SECTION 01 31 14 - FACILITY SERVICES COORDINATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination documents.

1.2 SUBMITTALS

- A. Submit coordination drawings and schedules prior to submitting shop drawings, product data, and samples.
- B. Areas of Work requiring Coordination Drawings include (but not limited to) mechanical rooms, electrical rooms, equipment rooms, corridors, horizontal exits from duct shafts, cross-overs and any other areas where congestion of Work occurs. Complete the requirements for Coordination Drawings within 75 days of starting construction operations. Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
 - 1. Content: Project-specific information, drawn accurately to scale.
 - 2. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. The Construction Documents in their original, copies or electronic file form are the Architect's instrument of service and are protected under copyright laws.
 - 3. Include the following information, as applicable:
 - a. Follow routing shown on Contract Drawings for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance and for repairs.
 - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - c. Indicate required installation sequences.
 - d. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
 - 4. Number of Copies: Submit two opaque copies of each submittal. Architect will return one copy.
 - a. Submit five copies where Coordination Drawings are required for operation and maintenance manuals. Architect will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.
 - 5. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
 - 6. Each trade shall sign and date the Coordination Drawings after the addition of their information.
 - 7. Do not begin fabrication until receipt of completed Coordination Drawings are acknowledged by the each contractor in writing to the Architect.
 - 8. No progress payments will be made for any work affected by coordination drawings until coordination drawings governing that work have been accepted.
 - 9. Any work installed prior to approval of coordination drawings shall be modified or replaced, as necessary, to conform to subsequently-approved construction drawings, at no additional cost to Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 COORDINATION REQUIRED

- A. Coordinate the work listed below:
 - 1. Fire Suppression: Division 21.
 - 2. Plumbing: Division 22.
 - 3. Heating, Ventilating, and Air Conditioning: Division 23.
 - 4. Integrated Automation: Division 25.
 - 5. Electrical: Division 26.
 - 6. Communications: Division 27.
 - 7. Electronic Safety and Security: Division 28.
 - 8. Site Utilities: Division 33.
 - 9. Commissioning requirements throughout the Project Manual.
- B. Coordinate progress schedules, including dates for submittals and for delivery of products.
- C. Conduct meetings among Subcontractors and others concerned, to establish and maintain coordination and schedules, and to resolve coordination matters in dispute.
- D. Participate in progress meetings. Report on progress of work to be adjusted under coordination requirements, and any required changes in schedules. Transmit minutes of meetings and reports to concerned parties.
- E. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
- F. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
- G. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
- H. Make adequate provisions to accommodate items scheduled for later installation.

3.2 COORDINATION DOCUMENTS

- A. Prepare coordination drawings to organize installation of products for efficient use of available space, for proper sequence of installation, and to identify potential conflicts.
 - 1. Priority of Construction Space:
 - a. Coordinate installation of different components to ensure performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
 - b. Following is the Order of Priority of construction space:
 - 1) First: Ductwork.
 - 2) Second: Fire protection piping.
 - 3) Third: Other piping.
 - 4) Fourth: Conduit.
- B. Prepare a master schedule identifying responsibilities for activities that directly relate to this work, including submittals and temporary utilities; organize by specification section.

- C. Identify electrical power characteristics and control wiring required for each item of equipment.
- D. Maintain maximum headroom at all locations without finished ceilings.
- E. Maintain finished ceiling heights as indicated.
- F. Coordinate installations with other trades to prevent conflict with Work of other trades and cooperate in making reasonable modifications in layout as needed.
- G. Where conflicts occur with placement of mechanical and electrical materials as they relate to placement of other building materials, the Architect shall be consulted for assistance in coordination of the available space to accommodate all trades.
- H. Maintain documents for the duration of the work, recording changes due to site instructions, modifications or adjustments.
- I. Any construction delays required to accomplish coordination, approval of submittals or re-submittals, or consequent to coordination work, shall be incurred at no additional cost to Owner; such delays may include, but not be limited to , the following:
 - 1. Time taken for preparation and submission of acceptable coordination drawings, including a reasonable period for Architect's review and approval.
 - 2. Time taken for preparation and approval of acceptable mock-ups.
 - 3. Time taken for modifications and replacements of non-conforming work.

3.3 COORDINATION OF SUBMITTALS

- A. Review shop drawings, product data, and samples for compliance with Contract Documents and for coordination with related work. Transmit copies of reviewed documents to Architect.
- B. Check field dimensions and clearances and relationship to available space and anchors.
- C. Check compatibility with equipment and work of other sections, electrical characteristics, and operational control requirements.
- D. Check motor voltages and control characteristics.
- E. Coordinate controls, interlocks, wiring of switches, and relays.
- F. Coordinate wiring and control diagrams.
- G. When changes in the work are made, review their effect on other work.
- H. Verify information and coordinate maintenance of record documents.

3.4 COORDINATION OF SUBSTITUTIONS AND MODIFICATIONS

- A. Review proposals and requests for substitution prior to submission to Architect.
- B. Verify compliance with Contract Documents and for compatibility with work of other sections.
- 3.5 OBSERVATION OF WORK
 - A. Observe work for compliance with Contract Documents.
 - B. Maintain a list of observed deficiencies and defects; promptly submit.
- 3.6 EQUIPMENT START-UP
 - A. Verify utilities, connections, and controls are complete and equipment is in operable condition as required by Section 01 70 00.
 - B. Observe start-up and adjustments, test run, record time and date of start-up, and results.

C. Observe equipment demonstrations made to Owner; record times and additional information required for operation and maintenance manuals.

3.7 INSPECTION AND ACCEPTANCE OF EQUIPMENT

- A. Prior to inspection, verify that equipment is tested, operational, clean, and ready for operation.
- B. Assist Architect with review. Prepare list of items to be completed and corrected.

SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, with network analysis diagrams and reports.
- C. Responsibility for completion of Work per schedule and preparation of recovery schedules.

1.2 REFERENCES

1.3 SUBMITTALS

- A. Within 15 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.
- G. Submit under transmittal letter form specified in Section 01 30 00.
- 1.4 QUALITY ASSURANCE
 - A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a preliminary network diagram.

3.2 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- C. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- D. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed

submittals will be required from Architect, within the Web-based Project Management Software. Indicate decision dates for selection of finishes.

- 1. The Architect shall maintain the submittal log between the Architect and Contractor through Web-based Project Management Software.
- 2. Contractor to maintain a submittal log with subcontractors.
- E. Coordinate content with schedule of values specified in Section 01 20 00.
- F. Provide legend for symbols and abbreviations used.

3.3 NETWORK ANALYSIS

- A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.
- B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
- C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
 - 1. Preceding and following event numbers.
 - 2. Activity description.
 - 3. Estimated duration of activity, in maximum 15 day intervals.
 - 4. Earliest start date.
 - 5. Earliest finish date.
 - 6. Actual start date.
 - 7. Actual finish date.
 - 8. Latest start date.
 - 9. Latest finish date.
 - 10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
 - 11. Monetary value of activity, keyed to Schedule of Values.
 - 12. Percentage of activity completed.
 - 13. Responsibility.
- D. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and recomputation of all dates and float.
- E. Required Reports: List activities in sorts or groups:
 - 1. By preceding work item or event number from lowest to highest.
 - 2. By amount of float, then in order of early start.

3.4 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.5 FLOAT TIME

- A. Float is not for the exclusive benefit of either Contractor or Owner.
- B. Manage work according to early start dates, by commencing activities on the early start date (calculated by the latest approved Contract Schedule) or earlier if possible, unless constrained by a bona fide resource limitation.
- C. Owner may reserve and apportion float time according to the needs of the Project.

- D. Actual or projected Owner-caused delays that do not exceed available float time shall not have any effect upon Contractor's adherence to specified time constraints and shall not be a basis for any time extension.
- E. Contractor acknowledges the following:
 - 1. Activity delays shall not automatically result in adjustment of specified time constraints.
 - 2. A Change Order or other Owner action or inaction may not affect existing critical activities or cause non-critical activities to become critical.
 - 3. A Change Order or delay may result in only absorbing a part of the available total float that may exist within an activity chain of the network, thereby not causing any effect on specified time constraints.
- F. Pursuant to the above float sharing requirements, use of float releaded by elimination of float suppression techniques such as preferential sequencing, special lead/lag logic restraints, unreasonably extended activity durations, or imposed dates shall be distributed by Owner to the benefit of Owner and Contractor.
- G. In the event of the Contractor wishes to complete the Work earlier than the time specified therefore:
 - 1. Continue to calculate float based on the Work completion date specified as of Contract execution, by maintaining the specified Work completion date as a "finish-no-later-than" constraint.
 - 2. The completion time for the Work shall be amended by Owner's acceptance of or acquiescence to Contractor's proposed earlier completion date.
 - 3. Contractor shall not, under any circumstances, receive additional compensation for indirect, general, administrative or other forms of overhead costs, for the period between the time of earlier completion proposed by Contractor and the completion time for the Work specified as of NTP.

3.6 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.
- G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.7 RESPONSIBILTY FOR COMPLETION

- A. Take a combination of the following actions, at no additional cost to the Owner, when the progress schedule illustrates that the Contract Substantial Completion date can not be met:
 - 1. Increase construction manpower in such quantities and trades to substantially eliminate the backlog of Work.

- 2. Increase the number of work hours per shift, shifts per working day, working days per week, or the amount of construction equipment, or any combination to substantially eliminate the backlog of Work.
- 3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities.
- B. Recovery Schedule: Prepare a recovery schedule from all trades to accelerate progress, if a milestone is missed, a single duration work activity is incomplete for ten work days, or overall work progress is deemed insufficient by the Owner/Architect.
 - 1. A recovery schedule must be initiated by the Contractor, reviewed by effected trade contractors and submitted ten working days after one of the above conditions occurs.
 - 2. Submit recovery schedule in same number of copies as original.
 - 3. Trades must execute means necessary to bring the Project back on schedule using the recovery schedule; accelerated Work and additional overhead necessary to keep the Project on schedule is included in the Contract.
 - 4. Recovery schedule to be double the size of the original diagram, as a minimum, illustrating existing and revised activities alongside original data; revised activities must be easily differentiated from originial schedule.
- C. Failure of the Contractor to comply with requirements of this subsection may be a basis for determination that the Contractor is not prosecuting the Work with such diligence as will ensure completion within the time stipulated; upon such determination, the Owner may take such action deemed appropriate.

3.8 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

SECTION 01 35 15 - LEED CERTIFICATION PROCEDURES

PART 1 GENERAL

1.1 PROJECT GOALS

- A. This project has been designed to achieve the LEED Silver (minimum 50 points) rating as defined in the LEED(r) Green Building Rating System(tm) for Schools, 2009 Edition.
- B. Contractor is not responsible for the application for LEED certification, nor for determination of methods of achieving LEED credits unless specifically so indicated.
- C. Many of the LEED credits can be achieved only through intelligent design of the project and are beyond the control of the Contractor. However, certain credits relate to the products and procedures used for construction. Therefore, the full cooperation of the Contractor and subcontractors is essential to achieving final certification.
- D. Contractor shall familiarize himself with the relevant requirements and provide the necessary information and instruction to all subcontractors and installers.
- E. Since Contractor and subcontractors may not be familiar with LEED requirements, this section includes a summary of the products and procedures intended to achieve LEED credits.
 - 1. Some credits are marked PREREQUISITE; these must be achieved regardless of the level of certification; many are dependent on proper performance by Contractor and subcontractors.
 - 2. Other credits involve quantifying percentages by weight and cost; these require careful recordkeeping and reporting by the Contractor.
 - 3. See www.usgbc.org for more information.

1.2 RELATED REQUIREMENTS

- A. Sections that include requirements intended to achieve LEED credits include, but are not limited to, the following:
- B. Section 01 35 16 LEED Submittal Forms: Procedures for using the forms.
 - 1. 01 35 16.07 LEED Prohibited Content Installer Certification; for each installer to certify compliance with the low-emitting criteria specified in Section 01 61 16.
- C. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions: List of product categories having VOC content restrictions, evidence required, and reporting requirements.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, Section 01 61 16 Low-Emitting Materials and Section 01 35 16 LEED Submittal Forms for additional submittal procedures.
- B. LEED Submittal/Report: For each product with the notation "show quantity on LEED submittal or report," submit a report with the following information:
 - 1. Submit with each Application for Payment; update the Report each period with latest period shown separately:
 - 2. Identify each product with:
 - a. Name and manufacturer.
 - b. Specification section number.
 - c. Applicable Credit(s).
 - d. Net weight per unit.
 - e. Quantity installed.
 - f. Material cost per unit.

- g. Total material cost.
- h. Other information specified for specific item.
- 3. Attach evidence of compliance from either the manufacturer or an independent agency.
- C. Action Plan:
 - 1. Submit a LEED Action Plan, based on the LEED Credit Summary and this Section, indicating approaches to achieve those credits; submit within 45 days of mobilization.
 - a. Credit MR 2.1 and 2.2: Waste Management Plan as specified within the Project Manual.
 - b. Credit MR 4.1 and 4.2: List of proposed materials.
 - 1) Provide preliminary matrix, using USGBC's LEED Form or spreadsheet verifying that the credit requirements will be met based on the identified materials containing recycled content.
 - 2) Indicate post-consumer recycled and pre-consumer recycled content for each product having recycled content, its source and material cost.
 - c. Credit MR 5.1 and 5.2: List of proposed regionally manufactured and extracted, harvested or recovered materials.
 - 1) Provide preliminary matrix, using USGBC's LEED Form or spreadsheet verifying that the credit requirements will be met based on the identified regionally manufactured and regionally extracted, harvested or recovered materials.
 - 2) Identify each regionally manufactured material, and each regionally extracted, harvested or recovered material by source and material cost.
 - d. Credit 7.0: List of proposed certified wood products.
 - 1) Provide preliminary matrix, using USGBC's LEED Form or spreadsheet verifying that the credit requirements will be met based on the identified certified wood products.
 - 2) Identify each FSC-certified wood product, its source, cost and Chain of Custody number.
 - e. Credit EQ 3.1 and 3.2: Construction Indoor Air Quality Management Plan complying with requirements of Section 01 57 21.
- D. Indoor Environmental Quality (IEQ) Prerequisite 3: List of proposed acoustical ceiling finish materials to be installed in all classrooms and core learning spaces.

1.4 MONTHLY REPORTS

- A. Monthly Progress Tracking: With each application for payment, submit reports comparing actual purchasing and construction activities with LEED Action Plans. Provide updated information submittal using LEED Form or spreadsheet, for the following LEED Credits sought for this Project:
 - 1. Material costs per LEED guidelines:
 - a. MR Credit 2 Construction Waste Management.
 - b. MR Credit 4 Recycled Content Materials.
 - c. MR Credit 5 Regional Materials.
 - 2. Total percentages of all permanently-installed wood value, for each item as it relates to the following credits.
 - a. MR Credit 7 Certified Wood Materials.

1.5 CLOSEOUT SUBMITTALS

- A. At completion of construction and prior to contract closeout; Submit the following documentation in electronic format:
 - 1. Final waste management package per requirements of Section 01 74 19.
 - 2. Final Materials and Resource Package: Provide individual electronic folders for Materials and Resources Credits 3, 4, 5 and 7 containing:
 - a. Legible electronic copies of relevent material product data for each product listed on the LEED Form.
 - b. Final PDF of completed LEED NC 2.2 Online Template including the total project materials cost and a complete product list with costs demonstrating compliance with required level of achievement.
 - 3. Final Indoor Environmental Quality, Construction Indoor Air Quality Management package per requirements of Section 01 57 21.
 - 4. Final Indoor Environmental Quality, Low Emitting Materials package per requirements of Sections 01 57 21 and 01 61 16.
 - 5. Sustainable Sites (SS) Credit 3: Detailed narrative describing site contamination and remediation efforts undertaken by the project.
 - a. For asbestos contamination, provide documentation officially indicating property contaminated by a standard equivalent to the referenced ASTM standard, meeting intent to rehabilitate damaged sites where development is complicated by real or perceived environmental contamination above or below ground, such as a Comprehensive Asbestos Survey assessment performed in accordance with EPA Regulation 40CFR Part 763 as regulated by and in accordance with the Toxic Substances Control Act (TSCA), New York State Industrial Code Rule 56, and the New York City Department of Health Title 15.
 - b. Copy of comprehensive asbestos investigation, which was performed by a certified asbestos investigator.
 - c. Copy of remediation documentation.
- B. LEED Online: Final completed LEED Form and associated required documentation uploaded to LEED Online Project Database including:
 - 1. Legible electronic copies of relevant material product data for each product listed on the LEED Form.
 - 2. Final PDF of completed LEED Form including all low-emitting materials utilized on the Project.
 - 3. Materials and Resources Credit 2, Construction Waste Management: Section 01 74 19.
 - 4. Materials and Resources Credit 4, Recycled Content.
 - 5. Materials and Resources Credit 5, Regional Materials.
 - 6. Materials and Resources Credit 7, Certified Wood.
 - 7. Indoor Environmental Quality Credits: Sections 01 57 21 and 01 61 16.
 - 8. Indoor Environmental Quality Prerequisite 3, Minimum Acoustical Performance.

1.6 INFORMATION SOURCES

A. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE); 1791 Tullie Circle, NE, Atlanta, GA 30329. Tel: (404) 636-8400. Fax: (404) 321-5478. www.ashrae.org.

- B. Center for Resource Solutions (CRS); Presidio Building, 49 P.O. Box 29512, San Francisco, CA 94129. Tel: (415) 561-2100. Fax: (415) 561-2105. www.resource-solutions.org or www.green-e.org.
- C. Green Seal; 1001 Connecticut Avenue, NW, Suite 827, Washington, DC 20036-5525. Tel: (202) 872-6400. Fax: (202) 872-4324. www.greenseal.org.
- D. South Coast Air Quality Management District (SCAQMD); 21865 E. Copley Drive, Diamond Bar, CA 91765. Tel: (909) 396-2000. www.aqmd.gov.
- E. U.S. Green Building Council (USGBC); 2101 L Street NW, Suite 500, Washington, DC 20037. Fax: (202) 828-5110. www.usgbc.org.

PART 2 PRODUCTS

2.1 GENERAL

- A. Calculate material cost per LEED guidelines.
 - 1. Include Divisions 03-10 and 31-32 products consistently in MR Credits.
 - 2. Include all expenses to deliver material to the Project Site incurred by the Contractor including taxes and transportation costs.
 - 3. Exclude installation labor and equipment, mechanical, electrical and plumbing components and specialty items such as elevators.

2.2 RECYCLED-CONTENT MATERIALS

A. Provide materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes a minimum 20 percent of total materials cost per LEED guidelines for MR Credit 4 and Innovation and Design (ID) Credit 1.

2.3 REGIONAL MATERIALS

A. Provide minimum 20 percent of materials that are harvested, extracted, recovered and manufactured within a 500-mile radius of project site as calculated by material cost per LEED guidelines for MR Credit 5 and Innovation and Design (ID) Credit 1.

2.4 CERTIFIED WOOD MATERIALS

- A. Provide new wood-based products such that 50 percent percent of permanently installed woodbased materials are certified as sustainably harvested in accordance with the Forest Stewardship Council (FSC) guidelines, in compliance with LEED MR Credit 7 and Innovation and Design (ID) Credit 1.
 - 1. FSC Pure and FSC Mixed Credit are valued at 100 percent of product cost.
 - 2. FSC Mixed (NN) percent are valued at indicated percentage of their cost.
 - 3. FSC Recycled and FSC Recycled Credit do not contribute to this credit. These products qualify to contribute to MR Credit 4.
 - 4. FSC bamboo-based products contribute to this credit and MR Credit 6.
 - 5. Where FSC wood is combined with non-FSC wood in an assembly, all non-FSC wood to meet the Controlled Wood criteria of the FSC. FSC wood in assemblies with non-Controlled Wood is not eligible for this credit.

2.5 MINIMUM ACOUSTICAL PERFORMANCE

A. Provide all classrooms and core learning spaces with ceiling finish materials with Noise Reduction Coefficient (NRC) of 0.70 or higher.

SECTION 01 35 16 - LEED SUBMITTAL FORMS

LEED SUBMITTAL FORMS

1.1 PURPOSE

A. These forms are for the Contractor's use in submitting documentation to be used to determine whether particular credits have been achieved. The cooperation of subcontractors, suppliers, and manufacturers is required.

1.2 FORMS

- A. 01 35 17 LEED Submittal Form: Coversheet for all LEED submittals.
- B. LEED Submittal Form for filter media installed during construction and prior to occupancy and photographs of SMACNA measures, as specified in Section 01 57 21 for EQ Credit 3.1.

1.3 PROCEDURES

- A. All LEED submittal forms are to be submitted by Contractor; certifications are to be made by indicated party.
- B. Where a LEED Submittal is called for, fill out and submit the appropriate form.
 - 1. Fill out one form for each different brand name product and each different manufacturer of a lot of commodity products.
 - 2. Where required attachments are specified, attach the documentation to the back of the form.
- C. Each form must be signed by the entity capable of certifying the information.
 - 1. Certification signatures must be made by an officer of the company.
 - 2. For products, certification must be made by the manufacturer not the supplier.
 - 3. For custom fabricated products, certification by the fabricator is acceptable.
- D. Submit the completed forms in accordance with the requirements of Section 01 30 00 Administrative Requirements, as information submittals.
 - 1. Give each form a unique submittal number.
 - 2. Do not combine LEED forms with product data or shop drawing submittals.
- E. Submit forms applicable to work for which application for payment is being made, either prior to or concurrent with application for payment; payment will not be made until relevant forms have been submitted.
- F. For work covered by multiple applications for payment, the initial submittal of a LEED form is sufficient for subsequent applications unless the nature of the product has changed.
SECTION 01 35 17 - LEED SUBMITTAL FORM

1.1 LEED SUBMITTAL FORM

- A. Instructions:
 - 1. Contractor shall include this form with each LEED submittal as required by the specifications for Divisions 3-10 and 31-32.
 - 2. For each item checked below, Contractor shall include supporting documentation. See supporting documentation types below.
 - 3. It is mandatory that the Contractor provide material cost as described below.
- B. Material Costs:
 - 1. Complete the following:
 - a. In accordance with Specification Section ______ we are providing

(name of material).

- b. Cost of materials, including taxes and delivery costs incurred by the Contractor, excluding installation labor \$
- C. Check the applicable LEED Credits below:
 - ____ MR Credit 3 Materials Reuse.
 - ____ MR Credit 4 Recycled Content.
 - ____ MR Credit 5 Regional Materials.
 - ____MR Credit 7 Certified Wood.
 - ____ EQ Credit 4.1 Adhesives & Sealants.
 - ____ EQ Credit 4.2 Paints and Coatings.
 - _____EQ Credit 4.3 Flooring Systems.
 - ____ EQ Credit 4.4 Composite Wood and Agrifiber Products.
- 1.2 MR Credit 4.1 Recycled Content, complete both:
 - Pre Consumer Recycled Content %_____.
 - Post Consumer Recycled Content %_____.
- 1.3 MR Credits 5.1 & 5.2 Regional Materials:
 - A. ____Check here to indicated the final manufacturering of the referenced material/product is within 500 miles of the Project Site.
 - Manufacturer:

Address: ______. Miles from Project:

- B. Check here to indicate that raw material(s) for this project are extracted or harvested within 500 miles of the Project Site.
 - <u>%</u> (by cost) of raw materials used to manufacture this material/product that were extracted/harvesed or recovered within 500 miles of the Project Site.
 - Raw Material Name/Description: ______.

Raw Material Supplier:

Extraction or Harvest Site of Raw Materials: ______. Miles From Project: ______.

1.4 MR Credit 7 - Certified Wood:

% of this material/product is composed of FSC Certified Wood.

_____.

Description of FSC Material/Component:

Describe the source of the FSC Certified Wood:

Vendor COC Number:

FSC Certification Attached: Yes or No .

____ Check here to indicate that invoice for this product and all other wood products will be submitted to the General Contractor.

- 1.5 EQ Credits 4.1 and 4.2 Low Emitted Material (Adhesives, Sealants, Paints, Coatings):g/l of VOC contained in submitted productg/l allowed.
- 1.6 EQ Credit 4.3 Flooring Systems:
 - Carpets meet Carpet and Rug Institute (CRI) Green Lable Plus Standard.
 - ____ Carpet cusion is used, and meets Carpet and Rug Institute (CRI) Green Lable Standard.
 - Hard Flooring is certified as compliant with FloorScore Standard.
 - ____ Carpet or Flooring adhesives are used, and their VOC content is _____ g/l.
 - _____ Sealants or Sealant Primers are used, and their VOC content is ______ g/l.
 - ____ Floor Coatings are used, and meet SCAQMD Rule 13. VOC content is _____ g/l.
- 1.7 EQ Credit 4.4 Composite Wood & Agrifiber Products:

____ Check here to indicate that all composite woods used on the interior are free of urea-formaldehyde.

____ Check here to indicate that laminating adhesives (shop and field-applied) are free of urea-formaldehyde.

1.8 SUPPORTING DOCUMENTATION - Check those documents attached:

- ____ MSDS Sheet.
- ____ Manufacturer's Cut Sheet.
- ____ Manufacturer's Statement.
- Industry Statement.
- Other Verification.

1.0 COMDANIV/MANILIEACTUDED.	1.9 COMPANY/MANUFACIURER. Phone
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Print Name:	 	
Signature:	 	
Title:	Date:	

SECTION 01 35 53 - SECURITY PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Security measures including formal security program, entry control, personnel identification, and miscellaneous restrictions.
- 1.2 SECURITY PROGRAM
 - A. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
 - B. Initiate program at project mobilization.
 - C. Maintain program throughout construction period until Owner occupancy.

1.3 ENTRY CONTROL

- A. Restrict entrance of persons and vehicles into Project site and existing facilities.
- B. Allow entrance only to authorized persons with proper identification.
- C. Maintain log of workers and visitors, make available to Owner on request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Mock-ups.
- D. Control of installation.
- E. Tolerances.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.2 REFERENCE STANDARDS

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Testing Agency Qualifications:
 - 1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time specialist and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- C. Schedule of Tests and Inspections: Prepare in tabular form, within 30 days following mobilization, and include the following:
 - 1. Specification section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- D. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- E. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.

- g. Type of test/inspection.
- h. Date of test/inspection.
- i. Results of test/inspection.
- j. Conformance with Contract Documents.
- k. When requested by Architect, provide interpretation of results.
- 2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- F. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- G. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- H. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 - 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.4 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.5 TESTING AND INSPECTION AGENCIES

A. Owner will employ and pay for services of an independent testing agency to perform specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

- 3.1 CONTROL OF INSTALLATION
 - A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
 - B. Comply with manufacturers' instructions, including each step in sequence.
 - C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
 - D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
 - E. Have Work performed by persons qualified to produce required and specified quality.
 - F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
 - G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.
 - H. Contractor must develop a plan to monitor and control installation and protection of Work to ensure compliance with LEED requirements specified elsewhere and acoustical integrity, including but not limited to the following:
 - 1. Clear airspace with no bridging elements at structural isolation joints.
 - 2. Independence of steel stud framing and/or masonry at double/triple wall construction.
 - 3. Mass and airtightness of gypsum board assemblies.
 - 4. Solidity, mass, and airtightness of concrete and masonry construction.
 - 5. Grout fill at sound-rated/sound-control door and window frames.
 - 6. Mass of sound-control door leaves.
 - 7. Tolerances between sound-rated/sound-control doors, frames, thresholds, and perimeter seals.
 - 8. Proper compression and adjustment of perimeter seals at sound-rated/sound-control doors.
 - 9. Locations and quiet operation of door latching and closer hardware.
 - 10. Tolerances between window sashes, frames, and perimeter seals.
 - 11. Thicknesses of laminated glazing and airtightness of perimeter seals at sound-control windows
 - 12. Extent and coverage of sound-attenuation blankets above ceilings and in partitions.
 - 13. Shaping of wall and ceiling finishes.
 - 14. Extent, location, and thickness of sound-absorbing finishes.
 - 15. Extent, location, operation, and storage of adjustable sound-absorbing drapery.
 - 16. Extent and shaping of ceiling reflectors.
 - 17. Acoustical transparency of scrim materials.
 - 18. Rigid attachment of finish materials to substrates.
 - 19. Restrictions on routing of ductwork, piping, conduit, wiring, cable and sleeves.
 - 20. Resilient sealing of penetrations.
 - 21. Sheet caulking at electrical boxes within gypsum board assemblies.

- 22. Flexible connections of plumbing, mechanical, electrical, and communications systems at equipment and structural isolation joints.
- 23. Sound power/pressure level limits of mechanical equipment and air devices.
- 24. Vibration isolation of conveying, plumbing, mechanical, electrical, and communications systems.
- 25. Location and performance of duct sound attenuators.
- 26. Internal duct lining in ductwork, plenums, and shafts.
- 27. External lagging of ductwork and piping.
- 28. Locations of volume control dampers.
- 29. Location and orientation of transfer ducts.
- 30. Reports for testing, adjusting, and balancing of HVAC systems.
- 31. Silent operation of theatrical and architectural lighting.
- 32. Silent operation of fluorescent ballasts.
- 33. Silent operation of fire alarm system in standby mode.
- 34. Remote location of transformers and power supplies.

3.2 MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.4 TESTING AND INSPECTION

- A. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 5. Perform additional tests and inspections required by Architect.
 - 6. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.

- 4. Agency has no authority to stop the Work.
- C. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.5 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.6 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Consultant's (or Owner's) action on Contractor's submittals, applications, and requests, "approved" is limited to Consultant's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- D. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- E. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- F. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- G. "Provide": Furnish and install, complete and ready for the intended use.
- H. "Contract Limit": Space available for performing construction activities; the primary area of Work may be indicated by a Limit of Construction line on Drawings, but Work necessary to complete the Project can also occur beyond this limit. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- I. "Remove": Detach items from existing construction and legally dispose of them offsite, unless indicated to be removed and salvaged or removed and reinstalled.
- J. "Remove and Salvage": Detach items from existing construction and deliver them to Owner ready for reuse.
- K. "Salvage": Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.
- L. "Remove and Reinstall": Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

- M. "Existing to Remain": Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- N. "Demolish": Tearing down, destruction, breakup, razing or removal of the whole or part of a building or structure, or a free standing machinery or equipment that is directly related to the function of the structure.
- O. "Recycle": Recovery of demolition waste for subsequent processing in preparation for reuse.
- P. "Board": Baltimore County Public Schools or Board of Education of Baltimore County.
- Q. "Department": The word "Department" shall mean the Department of Physical Facilities or Division of Physical Facilities.
- R. "Owner Representative": One of the following Board Representatives:

Superintendent, Baltimore County Public Schools Executive Director of Facilities Administrator, Engineering & Construction Project Manager

Any delegation of the Owner Representative's authority must be authorized in writing by any one of the above listed officials, and such delegation of authority will pertain only to the specific contract and/or contracts shown by the authorization. The title of the specific official will appear in those cases within these specifications where the word "Owner's Representative" as defined herein is not sufficiently specific.

- S. "Inspector": The authorized representative of the Owner's Representative assigned to make detailed inspection of any or all portions of the work, or materials therefor.
- T. "Advertisement": The public announcement, as required by law, inviting bids for work to be performed or materials to be furnished.
- U. "Agreement": The Agreement between the Contractor and the Board which is a document forming a part of the Contract.
- V. "Award": The decision and notice given by the Board of the acceptance of a Proposal.
- W. "Bid": A statement of price, terms of sale, and description of the supplies, services, construction or construction-related services offered by a bidder to the Board in response to an Invitation for Bids.
- X. "Bid Bond": See Proposal Guaranty.
- Y. "Bid Form": The approved form on which an Administration requires bids to be set forth and submitted.

- Z. "Bid Item": An item of work specifically described and for which a price, either unit or lump sum, is provided. It includes the performance of all work and the furnishing of all labor, equipment and materials described in any Supplemental Specifications or Special Provisions. (See Contract Items)
- AA. "Bidder": A person formally submitting a bid for the work contemplated, acting directly or through a duly authorized representative.
- BB. "Business": A corporation, partnership, individual, sole proprietorship, joint venture, or any other legal entity through which commercial activity is conducted.
- CC. "Business Day": Every day shown on the calendar except Saturdays, Sundays and Holidays.
- DD. "Calendar Days": Every day shown on the calendar except Saturdays, Sundays and Holidays included.
- EE. "Change Order": A written order signed by the responsible Owner's Representative, directing a Contractor to make changes to the Contract.
- FF. "Construction": The process of building, altering, repairing, improving or demolishing any structure, building, or other improvement to real property.
- GG. "Contingent Item": Any item listed in the contract documents and included in the Bid for the purpose of obtaining a contract price. Such bid constitutes tender of an exercisable option to incorporate such items into the work in accordance with the stated items at bid prices.
- HH. "Contract": The written Agreement executed between the Board and the successful bidder covering the performance of the work and the furnishing of labor, equipment and materials, by which agreement the Contractor is bound to perform the work and furnish the labor, equipment and materials and by which the Board is obligated to compensate him therefore at a mutually established and accepted rate or price. The Contract shall include all the documents listed under "Contract Documents", as well as any written Contract Modification that is required to complete the construction of the work in an acceptable manner, including any authorized extension thereof, all of which constitute one instrument.
- II. "Contract Bond": (See "Bid Bond", "Payment Bond", "Performance Bond" and "Proposal Guaranty").
- JJ. "Contract Documents": The written agreement executed between the Board and the successful bidder, covering the performance of the work and furnishing of labor, equipment and materials, by which the Contractor is bound to perform the work and furnish labor, equipment and materials, and by which the Board is obligated to compensate him therefor at the mutually established and accepted rate or price. The Contractor Documents shall include the Invitation for Bids, Notice to Contractors, Instruction to Bidders, Proposal, Contract Forms and Bonds, General Provisions, Specifications, Supplemental Specifications, all Special Provisions, all Technical

Provisions, all Plans and Notices to Proceed, also any written Change Orders and Supplemental Agreements that are required to complete the construction of the work in an acceptable manner, including authorized extension thereof, the Award Letter, the Agreement, and the Information for Bidders.

- KK. "Contract Drawings": (See definition of "Plans").
- LL. "Contract Item (Pay Item)": An item of work specifically described and for which a price, either unit or lump sum, is provided. It includes the performance of all work and the furnishing of all labor, equipment, and materials, described herein or described in any Supplemental Specifications or Special Provisions.
- MM. "Contract Modification": Any written alteration in the Specifications, delivery point, date of delivery, Contract period, price, quantity, or other provision of any existing Contract, whether accomplished in accordance with a Contract Provision, or by mutual action of the parties to the Contract. It includes change orders, extra work orders, supplemental agreements, Contract amendments, or reinstatements.
- NN. "Contractor": The party of the second part of the Contract; the individual, partnership, firm, or corporation undertaking the execution of the work under the terms of the Contract and acting directly or through his, their, or its agents or employees.
- OO. "Day": Calendar day unless otherwise designated.
- PP. "Fixed-Price Items": Unit prices established and prescribed by the Board to compensate for the cost of work and materials that may or may not be necessary for the proper completion of the Contract. Fixed-price items for the Contract are shown on the proposal.
- QQ. "Materials": Any substances specified for use in the construction of the project and its appurtenances.
- RR. "Notice to Contractor": (See "Invitation for Bids").
- SS. "Notice to Proceed": (NTP) A written notice to the Contractor of the date on or before which he shall begin the prosecution of the work to be done under the Contract.
- TT. "Payment Bond": A Board-approved form of security furnished by the Contractor and his Surety as a guaranty of good faith to pay promptly, or cause to be paid promptly, in full, such sums as may be due for material furnished and/or labor supplied or performed, or services rendered by public utilities or other parties in the prosecution of the work under the Contract. This bond is in addition to the Performance Bond.
- UU. "Performance Bond": The approved form of security, executed by the Contractor and his Surety or Sureties, guaranteeing complete compliance with the Contact and all Contract Modifications thereto.
- VV. "Plans": The official drawings issued by the Board as part of the Contract Documents, including those incorporated in the Contract Documents by reference.

- WW. "Procurement Agency": Board of Education of Baltimore County, Maryland.
- XX. "Proposal": The response by an offeror to a request for proposals issued by a procurement agency to obtain goods or labor. The response may include but is not limited to an offeror's price and terms for the proposed Contract, and description of technical expertise, work experience and other information as requested in the solicitation. As used herein the word "proposal" means "bid".
- YY. "Proposal Affidavit": A certified form which is required to accompany a bid.
- ZZ. "Proposal Form": The approved form on which the Board requires proposals to be set forth and submitted (See "Bid Forms").
- AAA. "Proposal Guaranty": The security designated in the Proposal to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Board if the work of constructing the improvement is awarded to him.
- BBB. "Questionnaire": The approved form or forms upon which the Contract shall furnish the information as to his ability to perform the work, his experience in similar work, the equipment to be used, and his financial condition as related to his ability to finance the work.
- CCC. "Responsible Bidder or Offeror": A person who has the capability I all respects to perform fully the Contract requirements, and the integrity and reliability that shall assure good faith performance.
- DDD. "Responsive Bid": A bid submitted in response to an Invitation for Bids that conforms in all material respects to the requirements contained in the Invitation for Bids.
- EEE. "Responsive Bidder": A Contractor prequalified by work categories whose bid conforms in all material respects to the solicitation.
- FFF. "Specification": A written description of functional characteristics, or the nature of a construction item to be procured. It may include a statement of any of the user's requirements and may provide for inspection, testing, or preparation of a construction item before procurement.
- GGG. "State Agency": A state agency or officer thereof, including any agency or officer succeed to their powers, duties, jurisdictions and authority in accordance with law.
- HHH. "Subcontractor": Any person undertaking a portion of the construction or any other part of the work under the terms of the Contract, by virtue of an agreement with the Contractor or a subcontractor, who prior to such undertaking has received the approval of the Administration. Subcontractor does not include an employee with an employment contract, or an employee organization with a collective bargaining agreement.
- III. "Superintendent": The executive representative of the Contractor authorized to receive and execute instructions from the procurement officer, and who shall supervise and direct the construction.

- JJJ. "Supplemental Agreement": Any written contract modification indicating an offer and acceptance as to terms, conditions, costs and time, satisfying the mutual interests of the parties thereto as indicated by the signature of the Contractor's authorized representative and the Engineer as mutually authorized in the Contract documents.
- KKK. "Surety": The corporate body bound with and for the Contractor, for the full and complete performance of the Contract, and for the payment of all debts pertaining to the work. When applying to the Bid Bond, it refers to the corporate body which engages to be responsible I the execution by the bidder of a satisfactory Contract.
- LLL. "Work": Work shall be understood to mean the furnishing of all labor, materials, equipment, an other incidentals necessary to the successful completion of the project and the carrying out of all the duties and obligations imposed but the Contract.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
- D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA)	(800) 872-2253
	Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(888) 293-6498 (202) 512-1530
CRD	Handbook for Concrete and Cement Available from Army Corps of Engineers	(601) 634-2355

	Waterways Experiment Station www.wes.army.mil	
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257
DSCC	Defense Supply Center Columbus (See FS)	
DPW	Baltimore County Department of Public Works – Standard Spec for Construction and Materials www.baltimorecounty.gov/Agencies/publicworks/standardsa ndspecs/specsanddetails.html	
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257
	Available from General Services Administration www.fss.gsa.gov	(202) 501-1021
	Available from National Institute of Building Sciences www.nibs.org	(202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543
MIL	(See MILSPEC)	
MIL-STD	(See MILSPEC)	
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257
NES	(Formerly: National Evaluation Service) (See ICC-ES)	
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers www.aaadm.com	(216) 241-7333
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
AAN	American Association of Nurserymen	
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 367-1155
ACI	ACI International (American Concrete Institute) www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000

AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AHA	American Hardboard Association (Now part of CPA)	
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AIEE	American Institute of Electrical Engineers	
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALCA	Associated Landscape Contractors of America www.alca.org	(800) 395-2522 (703) 736-9666
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts www.aosaseed.com	(505) 522-1437
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989

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API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers	(800) 527-4723
	www.ashrae.org	(404) 636-8400
ASLA	American Society of Landscape Architects	
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (212) 591-7722
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials Internation www.astm.org	(610) 832-9585 onal)
AWCI	AWCI International (Association of the Wall and Ceiling Industries Internative www.awci.org	(703) 534-8300 ational)
AWCMA	American Window Covering Manufacturers Association (Now WCSC)	on
AWI	Architectural Woodwork Institute www.awinet.org	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association www.awpa.com	(334) 874-9800
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711

	I	ansdowne Elementary SChool. New Construction PSCP # 03.105.17 MBU-516-17
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
BICSI	BICSI www.bicsi.org	(813) 979-1991
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963
BISSC	Baking Industry Sanitation Standards Committee www.bissc.org	(773) 761-4100
	Cast Stone Institute www.caststone.org	(770) 972-3011
CCC	Carpet Cushion Council www.carpetcushion.org	(203) 637-1312
CDA	Copper Development Association Inc. www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association www.canelect.ca/connections_online/home.htm	(613) 230-9263
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CGSB	Canadian General Standards Board w3.pwgsc.gc.ca/cgsb	(800) 665-2472 (819) 956-0425
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Associatio www.cisca.org	n (630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583

СРА	Composite Panel Association www.pbmdf.com	(301) 670-0604
CPPA	Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607
CRI	Carpet & Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(800) 463-6727 (416) 747-4000
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700
СТІ	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI EEI	Door and Hardware Institute www.dhi.org Edison Electric Institute	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee www.asce.org	(800) 548-2723 (703) 295-6300
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
EPA	Environmental Protection Agency	
ESD	ESD Association www.esda.org	(315) 339-6937

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FCC	Federal Communications Commission		
FCI	Fluid Controls Institute www.fluidcontrolsinstitute.org	(216) 241-7333	
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation) www.fiba.com	41 22 545 00 00	
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation) www.fivb.ch	41 21 345 35 35	
FM	Factory Mutual System (Now FMG)		
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000	
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Cont Association, Inc. www.floridaroof.com	ractors (407) 671-3772	
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850	
FSC	Forest Stewardship Council www.fsc.org	52 951 5146905	
GA	Gypsum Association www.gypsum.org	(202) 289-5440	
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208	
GRI	(Now GSI)		
GS	Green Seal www.greenseal.org	(202) 872-6400	
GSI	Geosynthetic Institute www.geosynthetic-institute.org	(610) 522-8440	
н	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700	
н	Hydronics Institute www.gamanet.org	(908) 464-8200	

HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAS	International Approval Services (Now CSA International)	
IBF	International Badminton Federation www.intbadfed.org	441-24 223-4904
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
IES	Illuminating Engineers Society	
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISO	International Organization for Standardization www.iso.ch	41 22 749 01 11
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(702) 567-8150
ITS	Intertek	(800) 345-3851

	www.intertek.com	(607) 753-6711
ITU	International Telecommunication Union www.itu.int/home	41 22 730 51 11
КСМА	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LMA	Laminating Materials Association (Now part of CPA)	
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (847) 577-7200
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MDOT	Maryland Department of Transportation	
MFMA	Maple Flooring Manufacturers Association www.maplefloor.org	(847) 480-9138
MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	(312) 644-6610
MH	Material Handling (Now MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSMT	Maryland Standard Method of Tests (as developed by the State Highway Administration)	
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NACE	NACE International (National Association of Corrosion Engineers International)	(281) 228-6200

www.nace.org

NADCA	National Air Duct Cleaners Association www.nadca.com	(202) 737-2926
NAGWS	National Association for Girls and Women in Sport	(800) 213-7193 ext. 453
	www.aahperd.org/nagws/	
NAIMA	North American Insulation Manufacturers Association (The) www.naima.org	(703) 684-0084
NBFU	National Board of Fire Underwriters	
NBGQA	National Building Granite Quarries Association, Inc. www.nbgga.com	(800) 557-2848
NBS	National Bureau of Standards	
NCAA	National Collegiate Athletic Association (The) www.ncaa.org	(317) 917-6222
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(262) 248-9094
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 775-3550
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NEC	National Electric Code	
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(303) 697-8441

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NFHS	National Federation of State High School Associatio	ons (317) 972-6900
NFPA	NFPA (National Fire Protection Association) www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
NGA	National Glass Association www.glass.org	(703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NIST	National Institute of Standards and Technology	
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association www.nofma.org	(901) 526-5016
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTMA	National Terrazzo & Mosaic Association, Inc. www.ntma.com	(800) 323-9736 (540) 751-0930
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)	
NWWDA	National Wood Window and Door Association (Now WDMA)	
OPL	Omega Point Laboratories, Inc. www.opl.com	(800) 966-5253 (210) 635-8100

OSHA	Occupational Safety and Health Administration	
PCA	Portland Cement Association	
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting & Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (978) 557-0720
PGI	PVC Geomembrane Institute http://pgi-tp.ce.uiuc.edu	(217) 333-3929
PTI	Post-Tensioning Institute www.post-tensioning.org	(602) 870-7540
RCSC	Research Council on Structural Connections www.boltcouncil.org	(800) 644-2400 (312) 670-2400
RFCI	Resilient Floor Covering Institute www.rfci.com	(301) 340-8580
RIS	Redwood Inspection Service www.calredwood.org	(888) 225-7339 (415) 382-0662
RLMI	Reflector and Lamp Manufacturers' Institute	
RMA	Rubber Manufacturers' Association	
RTI	(Formerly: NTRMA - National Tile Roofing Manufacturers Association) (Now TRI)	
SAE	SAE International www.sae.org	(724) 776-4841
SAWP	Society of American Wood Preservers	
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association	(516) 294-5424

SEI	Structural Engineering Institute www.seinstitute.com	(800) 548-2723 (703) 295-6195
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SHA	State Highway Administration	
SIA	Security Industry Association www.siaonline.org	(703) 683-2075
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SMPTE	Society of Motion Picture and Television Engineers www.smpte.org	(914) 761-1100
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPI/ SPFD	Society of the Plastics Industry, Inc. (The)	
	Spray Polyurethane Foam Division (Now SPFA)	
SPRI	SPRI (Single Ply Roofing Institute) www.spri.org	(781) 647-7026
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630

www.sefalabs.com

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SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	c (703) 907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(608) 833-5900
TPI	Turfgrass Producers International www.turfgrasssod.org	(800) 405-8873 (847) 705-9898
TRI	Tile Roofing Institute (Formerly: RTI - Roof Tile Institute) www.tileroofing.org	(312) 670-4177
UL	Underwriters Laboratories Inc. www.ul.com	(800) 285-4476 (847) 272-8800
ULI	Underwriters Laboratories, Incorporated	
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USAV	USA Volleyball www.usavolleyball.org	(888) 786-5539 (719) 228-6800
USGBC	U.S. Green Building Council www.usgbc.org	(202) 828-7422
USITT	United States Institute for Theatre Technology, Inc. www.usitt.org	(800) 938-7488 (315) 463-6463

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WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WBE	Women's Business Enterprise	
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (Now WCSC)	
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association) www.windowcoverings.org	(800) 506-4636 (212) 661-4261
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute California) www.wicnet.org	e of (916) 372-9943
WIC	Woodwork Institute of California (Now WI)	
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 548-0112
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930
PART 2 - PRO	DDUCTS (Not Used)	

PART 3 - EXECUTION (Not Used)

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary telecommunications services.
- B. Temporary telephone service.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Security requirements.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 51 00 Temporary Utilities.
 - B. Section 01 52 13 Field Offices and Sheds.
 - C. Section 01 55 00 Vehicular Access and Parking.
 - D. Section 01 35 53 Security Procedures.
 - E. Section 01 57 21 Indoor Air Quality Controls.
 - F. Section 01 58 13 Temporary Project Signage.
 - G. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions.

1.3 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Telephone Land Lines: One line, minimum; one handset per line.
 - 3. Internet Connections: Minimum of one; DSL modem or faster.
 - 4. Email: Account/address reserved for project use.
 - 5. Facsimile Service: Minimum of one dedicated fax machine/printer, with dedicated phone line.

1.4 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.

1.5 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.6 FENCING

A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.7 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- PART 2 PRODUCTS NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 51 00 - TEMPORARY UTILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, and water.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 50 00 Temporary Facilities and Controls: Telephone service for administrative purposes.

1.3 TEMPORARY ELECTRICITY

- A. Cost: By Contractor.
- B. Provide power service required from utility source.
- C. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.
- D. Provide main service disconnect and over-current protection at convenient location and meter.
- E. Permanent convenience receptacles may be utilized during construction.
- F. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft .
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lighting and provide routine repairs.

1.5 TEMPORARY HEATING

- A. Cost of Energy: By Contractor.
- B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
- C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
- D. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.6 TEMPORARY COOLING

- A. Cost of Energy: By Contractor.
- B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
- C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

D. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.7 TEMPORARY WATER SERVICE

- A. Cost of Water Used: By Contractor.
- B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
- PART 2 PRODUCTS NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 52 13 - FIELD OFFICES AND SHEDS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary field offices for use of Contractor.
- B. Maintenance and removal.

PART 2 PRODUCTS

- 2.1 MATERIALS, EQUIPMENT, FURNISHINGS
 - A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.

2.2 CONSTRUCTION

- A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.
- B. Construction: Structurally sound, secure, weather tight enclosures for office. Maintain during progress of Work; remove when no longer needed.
- C. Lighting for Offices: 50 fc at desk top height, exterior lighting at entrance doors.
- 2.3 ENVIRONMENTAL CONTROL
 - A. Heating, Cooling, and Ventilating: Automatic equipment to maintain comfort conditions.

2.4 CONTRACTOR OFFICE AND FACILITIES

- A. Size: For Contractor's needs and to provide space for project meetings.
- B. Furnishings in Meeting Area: Conference table and chairs to seat at least eight persons; racks and files for Contract Documents, submittals, and project record documents.
- C. Other Furnishings: Contractor's option.
- D. Equipment: Six adjustable band protective helmets for visitors, one 10 inch outdoor weather thermometer .

PART 3 EXECUTION

3.1 PREPARATION

A. Fill and grade sites for temporary structures to provide drainage away from buildings.

- 3.2 INSTALLATION
 - A. Install office spaces ready for occupancy 15 days after date fixed in Notice to Proceed.
 - B. Parking: Two hard surfaced parking spaces for use by Owner and Architect, connected to office by hard surfaced walk.

3.3 MAINTENANCE AND CLEANING

- A. Weekly janitorial services for offices; periodic cleaning and maintenance for offices.
- B. Maintain approach walks free of mud, water, and snow.

3.4 REMOVAL

A. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

SECTION 01 55 00 - VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Driveways, entrance and traffic routes.
- B. Parking.
- C. Existing pavements and parking areas.
- D. Permanent pavements and parking facilities.
- E. Construction parking controls.
- F. Traffic signs and signals.
- G. Maintenance.
- H. Removal, repair.
- I. Mud from site vehicles.

PART 3 EXECUTION

2.1 DRIVEWAYS, ENTRANCE AND TRAFFIC ROUTES

- A. Keep driveways and entrances serving premises and site surrounding Project clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Provide continuous monitoring of site.
 - 1. Schedule deliveries to minimize use of driveways and entrances.
 - 2. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Truck deliveries shall be scheduled so that the streets adjacent to the site do not back up with delivery trucks waiting to deliver materials. Trucks must be scheduled accordingly, or wait to unload inside the fence in the project site or off the Owner's property.

2.2 PARKING

- A. Use of existing parking facilities by construction personnel is not permitted.
- B. Use of new parking facilities by construction personnel is not permitted.
- C. Do not allow heavy vehicles or construction equipment in parking areas.
- D. Arrange for temporary parking areas to accommodate use of construction personnel.
- E. When site space is not adequate, provide additional off-site parking.
- F. Locate as approved by Architect.

2.3 NEW PERMANENT PAVEMENTS

- A. Prior to Substantial Completion the base for permanent roads and parking areas may be used for construction traffic.
- B. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.
- 2.4 CONSTRUCTION PARKING CONTROL
 - A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles . Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.

2.5 HAUL ROUTES

- A. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

2.6 TRAFFIC SIGNS AND SIGNALS

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
- B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
- C. Relocate as Work progresses, to maintain effective traffic control.

2.7 MAINTENANCE

- A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, Products, mud, snow, and ice.
- B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

2.8 REMOVAL, REPAIR

- A. Repair existing and new permanent facilities damaged by use, to original condition.
- B. Remove equipment and devices when no longer required.
- C. Repair damage caused by installation.

2.9 MUD FROM SITE VEHICLES

A. Provide means of removing mud from vehicle wheels before entering streets.

SECTION 01 57 21 - INDOOR AIR QUALITY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Construction procedures to promote adequate indoor air quality during and after construction.
- B. Testing air change effectiveness after completion of construction.

1.2 PROJECT GOALS

- A. See Section 01 35 15 LEED Certification Procedures, for overall project goals relating to environment and energy.
- B. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
 - 1. Cleaning of ductwork is not contemplated under this Contract.
 - 2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
- C. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
 - 1. Furnish products meeting the specifications.
 - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.
- D. Ventilation: HVAC system has been designed to achieve the minimum requirements for ventilation specified in ASHRAE 62.1.

1.3 REFERENCE STANDARDS

- A. ASHRAE Std 62.1 Ventilation For Acceptable Indoor Air Quality; 2012.
- B. ASHRAE Std 129 Measuring Air-Change Effectiveness; 1997 (Reaffirmed 2002).
- C. SMACNA (OCC) IAQ Guideline for Occupied Buildings Under Construction; 2007.

1.4 **DEFINITIONS**

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.
- E. Ventilation: The process of supplying and removing air to and from interior spaces by natural or mechanical means.
- F. Volatile Organic Compound (VOC): Carbon compounds that participate in atmospheric photochemical reactions, (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonates, and ammonium carbonate); the compounds vaporize (become a gas) at normal room temperatures.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA IAQ Guidelines for Occupied Buildings Under Construction as a guide.
 - 1. Submit not less than 60 days before enclosure of building.
 - 2. Identify potential sources of odor and dust.
 - 3. Identify construction activities likely to produce odor or dust.
 - 4. Identify areas of project potentially affected, especially occupied areas.
 - 5. Evaluate potential problems by severity and describe methods of control.
 - 6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
 - 7. Describe cleaning and dust control procedures.
 - 8. Describe coordination with commissioning procedures.
- C. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
- D. Indoor Air Quality Testing Schedule: Describe procedures and dates.
- E. Duct and Terminal Unit Inspection Report.
- F. Ventilation Effectiveness Test Plan: Identify:
 - 1. Testing agency qualifications.
 - 2. Description of test spaces, including locations of air sampling.
 - 3. Test procedures, in detail; state whether tracer gas decay or step-up will be used.
 - 4. Test instruments and apparatus; identify tracer gas to be used.
 - 5. Sampling methods.
- G. Ventilation Effectiveness Test Reports: Show:
 - 1. Include preliminary tests of instruments and apparatus and of test spaces.
 - 2. Calculation of ventilation effectiveness, E.
 - 3. Location where each sample was taken, and time.
 - 4. Test values for each air sample.
 - 5. HVAC operating conditions.
 - 6. Other conditions or discrepancies that might have influenced results.
- H. LEED Closeout Submittals:
 - 1. General: At completion of construction and prior to contract close-out, submit the following for information purposes in electronic format.
 - 2. Final Construction Indoor Air Quality Management, During Construction, Package for IEQ Credit 3.1: At completion of construction and prior to contract close-out, submit:
 - a. Approved Construction Indoor Air Quality Management Plan.
 - b. Construction Photographs: Six taken at 3 separate times for a total of eighteen (18) digital photographs of required construction indoor air quality management measures.
 - 1) HVAC protection.
 - 2) Source Control.
 - 3) Pathway Interruption.
 - 4) Housekeeping.
 - 5) Scheduling.

- 6) Protection of absorptive or dry sink materials, including but not limited to carpet, gypsum board, acoustical ceiling tiles, and insulation.
- 7) Temporary filtration media, if HVAC is operated during construction.
- c. Product data of filtration media used during construction and installed immediately prior to occupancy including MERV values, manufacturer's name and model number.
- d. Meeting minutes, checklists, worksheets, notifications and deficiency or resolution logs related to the project IAQ issues.
- e. Final LEED IEQ Credit 3.1 Online Template indicating compliance with credit requirements.
- 3. Final Construction Indoor Air Quality Management Plan, Prior to Occupancy, Package for IEQ Credit 3.2: At completion of construction and prior to contract close-out, submit:
 - a. Compliance Path Option 2: Baseline Indoor Air Quality Testing reports showing results and location of each test indicating that the maximum chemical contaminate concentration requirements are not exceeded, a summary of HVAC operating conditions, a listing of discrepancies and recommendations for corrective actions, if needed.
 - 1) Include certification of test equipment calibration with each test report.
 - b. Final LEED IEQ Credit 3.2 Online Template indicating compliance with credit requirements.
- 4. Final Low Emitting Materials Package for IEQ Credits 4.1, 4.2, 4.3, and 4.4: Provide individual electronic folders for each credit containing:
 - a. Legible electronic copies of relevant material product data, with applicable criteria highlighted, for each product listed on the LEED Form.
 - b. Final LEED Form including all low-emitting materials used on Project.
- 5. LEED Online: Final LEED Form and associated required documentation uploaded to LEED Online for each of the following Credits:
 - a. IEQ Credit 3.1, Construction Indoor Air Quality Management, During Construction.
 - b. IEQ Credit 3.2, Construction Indoor Air Quality Management, Prior to Occupancy.
 - c. IEQ Credit 4.1, Low Emitting Materials, Adhesives and Sealants.
 - d. IEQ Credit 4.2, Low Emitting Materials, Paints and Coatings.
 - e. IEQ Credit 4.3, Low Emitting Materials, Flooring Systems.
 - f. IEQ Credit 4.4, Low Emitting Materials, Composite Wood and Agrifiber Products.

1.6 SCHEDULING

- A. Coordinate construction activities to minimize or eliminate disruption of operations in occupied portions of building.
- B. Schedule for storage, installation, and protection of all components of air distribution systems.
- C. Schedule for storage, installation, and protect of absorptive materials (woven, fibrous or porous in nature, such as carpet, ceiling tiles, insulation, and fabrics) from exposure to emissions during and after installation from materials and finishes with potential for short-term release of off-gassing volatile organic compounds.
 - 1. Highlight critical methods used to protect absorptive materials from airborne pollutants such as: dust, debris, moisture, gaseous and microbial contamination.
 - 2. Sequence installation of absorptive materials after odor-emitting activities have occurred and have been mitigated by ventilation.
- D. Do not store absorptive materials on-site if protection measures as described above cannot be ensured.
- E. Avoid building occupancy while construction related pollutants are present.

F. Ensure proper and complete curing of concrete before covering.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.
- B. Auxiliary Air Filters:
 - 1. MERV of 8, minimum, when tested in accordance with ASHRAE 52.2, during construction.
 - 2. MERV of 13, minimum, when tested in accordance with ASHRAE 52.2, installed prior to occupancy.

PART 3 EXECUTION

- 3.1 CONSTRUCTION PROCEDURES
 - A. Prevent the absorption of moisture and humidity by adsorptive materials by:
 - 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
 - 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
 - 3. Provide sufficient ventilation for drying within reasonable time frame.
 - B. Begin construction ventilation when building is substantially enclosed.
 - C. HVAC system shall be kept clean, free of dust, debris, moisture, gaseous and microbial contamination during storage, handling, installation and punch-out. Inspect all air inlets, air outlets, grilles, diffusers, plenums, and ducts upon completion of Work.
 - 1. Cover and protect (taped plastic or similar method) all exposed air inlet and outlet openings, grilles, ducts, plenums, to prevent water, moisture, dust and other contaminate intrusion.
 - 2. Apply protection immediately after installation of equipment and ducting.
 - 3. Ducting runs that require more than a single day to install shall be protected at end of each day's Work.
 - 4. Leaks in return ducts and air handlers shall be checked and repaired.
 - 5. Inspect filtration monthly and replace as needed with new media throughout the HVAC system; filtration media shall be minimum MERV 8.
 - 6. After final phase of construction, install new filtration media throughout the HVAC system; filtration media shall be minimum MERV 8.
 - 7. Cleaning of ductwork is not part of this contract; however Contractor shall bear cost of cleaning required by Owner due to failure of Contractor to protect ducts and equipment from construction pollutants as specified.
 - D. HVAC equipment and ductwork may NOT be used for ventilation during construction:
 - 1. Provide temporary ventilation equivalent to 1.5 air changes per hour, minimum.
 - 2. Exhaust directly to outside.
 - 3. Seal HVAC air inlets and outlets immediately after duct installation.
 - E. Do not store construction materials or waste in mechanical or electrical rooms.
 - F. Provide direct exhaust to the exterior during installation of strong emitting materials, including touch-up activities; keep exhaust away from intakes and occupied spaces.

- G. Provide adequate ventilation of packaged dry products prior to installations. Remove from package and place in a secure, dry, well-ventilated space, free from contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degree maximum continuously during ventilations period. Do not ventilate within limits of Work unless otherwise approved by Architect.
- H. "Bake-out" or "super-heating" of spaces to accelerate the release of gaseous emissions is not permitted.
- I. Prohibit smoking and use of fossil-fueled temporary heating units inside the building and near building entrances, windows and intakes and within 25 feet of building entrances.
- J. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
 - 1. Inspect duct intakes, return air grilles, and terminal units for dust.
 - 2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
 - 3. Clean tops of doors and frames.
 - 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
 - 5. Clean return plenums of air handling units.
 - 6. Remove intake filters last, after cleaning is complete.
- K. Use low-toxic pest control chemicals such as boron, if needed, unless otherwise directed.
- L. Remove spills or excess application of solvent-containing products as soon as possible. Use low-emitting cleaning agents, giving preference to Green Seal products.
- M. Keep work areas as dry as possible; replace any absorptive (dry sink) material that is exposed to moisture.
- N. Use other relevant recommendations of SMACNA IAQ Guideline for Occupied Buildings Under Construction for avoiding unnecessary contamination due to construction procedures.

3.2 PATHWAY INTERUPTION

- A. Provide negative pressurization of spaces under construction and/or demolition and positive pressurization of occupied or finished spaces while construction work proceeds in adjacent areas.
- B. Relocate pollutant sources when project equipment or staging areas coincide with critical air flow pathways and place plastic barriers to contain construction areas.
- C. Temporarily seal building, including air intakes and exhaust vents, and any other building openings, when dust-generating or strong-emitting construction products or procedures are used on the exterior of the building.
- D. Once spaces within building become occupied, work areas must remain under negative pressure. Exhaust air at a rate at least 10% greater than the rate of supply. Do not exhaust air where it can be drawn back into occupied spaces and place a continuous plastic barriers creating a seal between construction areas and occupied spaces.

3.3 INDOOR AIR QUALITY MANAGEMENT - PRIOR TO OCCUPANCY

- A. Provide indoor air quality testing after construction ends, prior to occupancy, with all interior finishes installed, and with the building completely cleaned.
 - 1. Use testing protocols consistent with US EPA "Compendium of Methods for the Determination of Air Pollutants in Indoor Air" or as detailed in the LEED 2009 Green

Building Design and Construction Reference Guide ISO Table. Testing must be done in accordance with one standard.

- 2. Complete punch list prior to start of testing.
- 3. Provide the services of a qualified Indoor Air Quality Testing Services Firm.
- 4. Support the indoor air quality testing services firm by coordinating scheduling of required testing, and providing services for IAQ remediation if necessary.
- 5. Test for the following contaminant concentration levels:

Chemical Contaminant	Maximum Concentration
Carbon Monoxide (CO)	9 parts per million and no greater than 2 ppm above outdoor levels
Formaldehyde	27 parts per billion
Particulates (PM10)	50 micrograms per cubic meter
TVOC	500 micrograms per cubic meter
*4-Phenylcyclohexene (4-PCH)	6.5 micrograms per cubic meter

*This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing material are installed as part of the base building systems.

- 6. For each sampling point where maximum concentration limits are exceeded, conduct flush-out with outside air and retest the specific parameter(s) that were exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. Take samples from the same locations as the first test when re-testing non-complying building areas.
- 7. Conduct all measurements prior to occupancy, but during normal occupied hours and with building ventilation system starting at regular daily start time and operating at minimum outside air flow rate for occupied mode throughout duration of the air testing.
 - a. Non-fixed furnishings such as workstations and partitions are encouraged, but not required to be in place for testing.
- 8. For each portion of Project served by a separate ventilation system, provide sampling points not less than one per 25,000 square feet for each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.
- 9. Sample one in seven of spaces that are identical in construction, finishes, configuration, square footage and HVAC system.
 - a. If failure is encountered during sample testing, conduct re-sampling to assess whether that failure is unique or the rest of the units are likely to have similar failings. Re-sample one of up to six untested units in the group. If re-sample confirms that the requirements are met, then the unit with the failure will not be considered an indication of failure in the other units in the group. Provide corrective action for the unit with the failure, re-test. However, if field testing in the re-sample results in a second failure, then all units in the group must be tested for compliance.
- 10. Collect air samples between 3 feet and 6 feet from the floor over a minimum four hour period.

3.4 VENTILATION EFFECTIVENESS TESTING

- A. Perform ventilation effectiveness testing before occupancy.
- B. Do not begin ventilation effectiveness testing until:
 - 1. HVAC testing, adjusting, and balancing has been satisfactorily completed.

- 2. Building flush-out or air contaminant testing has been completed satisfactorily.
- 3. New HVAC filtration media have been installed.
- C. Test each air handler zone in accordance with ASHRAE 129.
- D. If calculated air change effectiveness for a particular zone is less than 0.9 due to inadequate balancing of the system, adjust, and retest at no cost to Owner.

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations and procedures.
- F. Procedures for Owner-supplied products.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 45 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- D. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.2 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Where all other criteria are met, Contractor shall give preference to products that:
 - 1. Are extracted, harvested, and/or manufactured closer to the location of the project.

- 2. Have longer documented life span under normal use.
- 3. Result in less construction waste.
- 4. Are made of vegetable materials that are rapidly renewable.
- C. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- D. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
 - 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
- E. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

2.3 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products of Named Manufacturers: Contractor to provide products from named manufacturers; refer to other provisions regarding substitutions.
- C. Or Equal Product: Product that is demonstrated and approved through submittal process, as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- D. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

2.4 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.1 SUBSTITUTION PROCEDURES

A. Substitutions are not permitted during the bid phase. Comply with requirements specified in this section after date of agreement.

- B. Timing: Architect will not consider requests for substitution after defined time period, except for extenuating circumstances described below; requests may be considered or rejected at discretion of Architect.
 - 1. The specification permits "Or Equal."
 - 2. The product is no longer manufactured.
 - 3. The product is not available due to a strike.
 - 4. The specified product is identified as incompatible or inappropriate for the project.
 - 5. The specified item fails to comply with building code requirements.
 - 6. The manufacturer or fabricator declares a specified product to be unsuitable for the use intended and refuses to warrant its installation.
 - 7. Significant cost savings to the Owner.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
 - 1. Statement indicating why specified material or product cannot be provided.
 - 2. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - 3. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 4. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - 5. Samples, where applicable or requested.
 - 6. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - 7. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - 8. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - 9. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - 10. Cost information, including a proposal of change, if any, in the Contract Sum.
 - 11. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - 12. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- D. A request for substitution constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.

- 5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
 - 3. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 - 4. Architect will consider Contractor's request for substitution when the following conditions are met. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Substitution requested must meet or exceed specified material, product or equipment items appearance, function and quality level as determined by the Architect and Owner.
 - b. Requests for substitution must include clear identification of the material, product or equipment item and complete description including drawings, cuts, performance and test data, along with any other information necessary for a complete evaluation.
 - c. Requested substitution shall not require extensive revisions to the Contract Documents or changes to any other materials, products or equipment items.
 - d. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - e. Substitution request is fully documented and properly submitted.
 - f. Requested substitution will not adversely affect Contractor's Construction Schedule.
 - g. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - h. Requested substitution is compatible with other portions of the Work.
 - i. Requested substitution provides specified warranty.
 - j. Requested substitution will not delay the Work.
 - k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
 - 1. The Architect's/Owner's decision to accept or reject the proposed substitution shall be final and will be set forth in writing.
- G. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later. Architect's notification will be in one the following forms:
 - 1. Form of Acceptance:
 - a. After Contract signing: Change Order.
 - 2. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

3.2 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:

- 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
- 2. Arrange and pay for product delivery to site.
- 3. On delivery, inspect products jointly with Contractor.
- 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
- 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.3 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.4 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturer's warranty conditions, if any.
- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

- I. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- J. Prevent contact with material that may cause corrosion, discoloration, or staining.
- K. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- L. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.



SUBSTITUTION REQUEST

Project:	Substitution Request Number:			
	From:			
To:	Date:			
	A/E Project Number:			
Re:	Contract For:			
Specification Title:	Description:			
Section: Page:	Article/Paragraph:			
Proposed Substitution:				
Manufacturer: Phone:				
Trade Name:	Model No.:			
Installer: Address:	Phone:			
History: New product 2-5 years old 5-10 yrs o	old Different More than 10 years old			
Differences between proposed substitution and specified produc	ct:			
r . r . r . r . r . r . r . r . r . r .				
Point-by-point comparative data attached - REQUIRED BY	/ A/E			
Reason for not providing specified item:				
Similar Installation: See attached "Project List"				
Project: Arc	chitect:			
Address: Ow	mer:			
Dat	e Installed			
Drenegad substitution offsate other parts of Works				
Proposed substitution affects other parts of work.				
Savings to Owner for accepting substitution:	(\$).			
Proposed substitution changes Contract Time:	Yes [Add] [Deduct]days.			
Supporting Data Attached: Drawings Product D	Data 🗌 Samples 🗌 Tests 🗌 Reports 🗌			
	Upon request			
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The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by:					
Signed by:					
Firm:					
Address:					
Telephone:					
Attachments:					
☐ Substitution approved ☐ Substitution approved ☐ Substitution rejected - ☐ Substitution Request re Signed by:	- Make submittals in as noted - Make subn Use specified materi eceived too late - Use	accordance with Spea mittals in accordance als. e specified materials.	cification Sectior	n 01330. n Section 01330.	Date:
Additional Comments:	Contractor	Subcontractor	Supplier	Manufacturer	A/E

SECTION 01 61 16 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Low-emitting restrictions for product categories listed below under "DEFINITIONS."
 - B. VOC-restricted products.
 - C. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.2 **DEFINITIONS**

- A. Low-Emitting Products: All products of each of the following categories when installed or applied on-site in the building interior:
 - 1. Adhesives, sealants, and sealer coatings.
 - 2. Carpet tile.
 - 3. Resilient floor coverings.
 - 4. Paints and coatings.
 - 5. Cabinet work.
 - 6. Composite wood and agrifiber products used either alone or as part of another product.
 - 7. Laminating Adhesives (shop and field-applied) used in composite wood assemblies.
- B. Interior of Building: Within the building waterproofing envelope.
- C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Evidence of Compliance: Submit for each different product in each applicable category.
 1. Identify evidence submittals with the words "LEED Report".
- C. Product Data: Provide the following product data for low-emitting materials:
 - 1. Adhesives, sealants, paints and coatings: Proof of VOC content as measured in grams per Liter (g/L).
 - 2. Carpet: Proof of Green Label Plus certification.
 - 3. Carpet Cushion: Proof of Green Label certification.
 - 4. Resilient Flooring System: Proof of Floor Score certification or alternate compliance.
 - 5. Composite wood and agrifiber products: Manufacturer declaration that product contains no added urea-formaldehyde (NAUF).
 - 6. Laminating Adhesives: Manufacturer declaration that product contains no added ureaformaldehyde.
- D. Installer Certifications for Accessory Materials: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.
 - 1. Use the form following this section for installer certifications.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Adhesives applied within the building waterproofing envelope shall comply with the current VOC Content limits, as expressed in grams per liter, of South Coast Air Quality Management District (SCAQMD) Rule 1168 "Adhesive and Sealant Applications," amended January 7, 2005, or more stringent levels, as follows; Adhesives and Sealants integral to waterproofing system are exempt:
 - 1. Indoor Carpet & Pad Adhesives: 50.
 - 2. Wood Flooring Adhesive: 100.
 - 3. Rubber Floor Adhesives: 60.
 - 4. Subfloor Adhesives: 50.
 - 5. Ceramic Tile Adhesives: 65.
 - 6. VCT and Asphalt Tile (& Linoleum) Adhesives: 50.
 - 7. Dry Wall and Panel Adhesives: 50.
 - 8. Cove Base Adhesives: 50.
 - 9. Multipurpose Construction Adhesives: 70.
 - 10. Structural Glazing Adhesives: 100.
 - 11. PVC Welding: 510.
 - 12. CPVC Welding: 490.
 - 13. ABS Welding: 325.
 - 14. Plastic Cement Welding: 250.
 - 15. Adhesive Primer for Plastic: 550.
 - 16. Contact Adhesive: 80.
 - 17. Special Purpose Contact Adhesive: 250.
 - 18. Structural Wood Member Adhesive: 140.
 - 19. Metal to metal substrates: 30.
 - 20. Plastic foam substrate: 50.
 - 21. Porous substrate except wood: 50.
 - 22. Wood substrate: 30.
 - 23. Fiberglass substrate: 80.
 - 24. All Other Welding & Installation Adhesives: 250.
- B. Aerosol Adhesives applied within building waterproofing envelope shall comply with the VOC Content limits, as expressed in percentage of VOCs by weight, of Green Seal (GS) Standard GS-36 "Commercial Adhesives," October 19, 2000 as follows:
 - 1. General Purpose Mist Spray: 65% VOCs by weight.
 - 2. General Purpose Web Spray: 55% VOCs by weight.
 - 3. Special Purpose Aerosol Adhesives (all types): 70% VOCs by weight.
- C. Sealants applied within building waterproofing envelope shall comply with VOC Content limits, as expressed in grams per liter, less water and exempt compounds, of SCAQMD Rule 1168 "Adhesive and Sealant Applications," amended January 7, 2005, as follows:
 - 1. Architectural Sealants: 250.
 - 2. Non-membrane Roof: 300.
 - 3. Single-Ply Roof Membrane: 450.
 - 4. Other: 420.
- D. Sealant primers applied within building waterproofing envelope shall comply with VOC Content limits, as expressed in grams per liter, less water and exempt compounds, of

SCAQMD Rule 1168 "Adhesive and Sealant Applications," amended January 7, 2005, as follows:

- 1. Architectural, Nonporous: 250.
- 2. Architectural, Porous: 775.
- 3. Other: 750.
- E. Paints and Coatings:
 - 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 2. Credit EQ 4.2: VOC limits.
 - a. Flat Paints, Coatings, and Primers: VOC not more than 50 g/L.
 - b. Non-Flat Paints, Coatings, and Primers: VOC not more than 150 g/L.
 - c. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
 - d. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
 - e. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
 - f. Floor Coatings: VOC not more than 100 g/L.
 - g. Shellacs, Clear: VOC not more than 730 g/L.
 - h. Shellacs, Pigmented: VOC not more than 550 g/L.
 - i. Stains: VOC not more than 250 g/L.
 - j. Primers, Sealers, and Undercoaters: VOC not more than 200 g/L.
 - k. Dry-Fog Coatings: VOC not more than 400 g/L.
 - 1. Zinc-Rich Industrial Maintenance Primers: VOC not more than 340 g/L.
 - m. Pretreatment Wash Primers: VOC not more than 420 g/L.
 - 3. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
 - 4. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
- F. Carpets: Comply with testing and product requirements of the Carpet and Rug Institute Green Label Plus program.
- G. Carpet cushion: Comply with testing and product requirements of the Carpet and Rug Institute Green Label program.
- Hard Surface Flooring and Wall Base System (vinyl, linoleum, laminate, rubber, wood flooring - except solid unfinished wood and mineral-based integrally finished flooring): Comply with testing and product requirements of the Resilient Floor Covering Institute's FloorScore Program.
 - Option 1: Comply with the testing and product requirements of the California Department of Health Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda (California Section 01350 Specification). The following are options to demonstrate compliance:
 - a. Listed in the Collaborative for High Performance Schools (CHPS) High Performance Product Database.
 - b. Certified by GREENGUARD Gold.

- I. Permanently installed composite wood and agrifiber products (particleboard, medium density, plywood, wheatboard, strawboard, panel substrates and door cores): No added urea-formaldehyde resins.
 - 1. Option 1: Products using melamine urea formaldehyde (MUF) may comply with the California Air Resource Board (CARB) Airborne Toxic Control Measure (ATCM) 93120 requirements for no- added formaldehyde based resins or the requirements for ultra-low-emitting formaldehyde resins (ULEF).
- J. Laminating adhesives used in composite wood and agrifiber product assemblies, shop-applied and applied on-site: No added urea-formaldehyde resins.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. All additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

SECTION 01 61 16.01 - ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

- .1 FORM
 - A. Identification:
 - 1. Project Name:
 - 2. Project No.:
 - 3. Architect:
 - B. Use of This Form:
 - 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - 2. Contractor is required to obtain and submit this form from each installer of work on this project.
 - 3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
 - 4. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product.
 - C. VOC content restrictions are specified in Section 01 61 16.

1.1 PRODUCT CERTIFICATION

- A. I certify that the installation work of my firm on this project:
 - 1. [HAS] [HAS NOT] required the use of any ADHESIVES.
 - 2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
 - 3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
 - 4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS and Laminating Adhesives.
- B. Product data and MSDS sheets are attached.
- 2.1 CERTIFIED BY: (Installer/Manufacturer/Supplier Firm)
 - A. Firm Name:
 - B. Print Name:
 - C. Signature:
 - D. Title: _____(officer of company)
 - E. Date:

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.

1.2 RELATED REQUIREMENTS

- A. Section 01 50 00 Temporary Facilities and Controls: Temporary exterior enclosures.
- B. Section 01 50 00 Temporary Facilities and Controls: Temporary interior partitions.
- C. Section 07 84 00 Firestopping.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Alternatives to cutting and patching.
 - f. Effect on work of Owner or separate Contractor.
 - g. Written permission of affected separate Contractor.
 - h. Date and time work will be executed.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.4 QUALIFICATIONS

A. For survey work, employ a land surveyor registered in the State of Maryland and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

1.5 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- G. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
 - 3. Review conflicts and compatibility issues.
 - 4. Review environmental limitations and protection.
 - 5. Examine substrates.
 - 6. Review requirements of the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related Change Orders.
 - d. Submittals.
 - e. Mockups.
 - f. Testing and inspection.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.4 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- F. Utilize recognized engineering survey practices.
- G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

- 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
- 2. Grid or axis for structures.
- 3. Building foundation, column locations, ground floor elevations.
- H. Periodically verify layouts by same means.
- I. Maintain a complete and accurate log of control and survey work as it progresses.

3.5 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.6 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as shown.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
 - 2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
 - 2. Relocate items indicated on drawings.
 - 3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.

- 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
- 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
- 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
- 4. Verify that abandoned services serve only abandoned facilities.
- 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.
- G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- H. Refinish existing surfaces as indicated:
 - 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 - 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
 - 3. Patch as specified for patching new work.
- I. Clean existing systems and equipment.
- J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- K. Do not begin new construction in alterations areas before demolition is complete.
- L. Comply with all other applicable requirements of this section.

3.7 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.

- 5. Repair areas adjacent to cuts to required condition.
- 6. Repair new work damaged by subsequent work.
- 7. Remove samples of installed work for testing when requested.
- 8. Remove and replace defective and non-conforming work.
- D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- H. Restore work with new products in accordance with requirements of Contract Documents.
- I. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- J. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
- K. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- M. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

3.8 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.9 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Prohibit traffic from landscaped areas.
- H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- D. Verify that wiring and support components for equipment are complete and tested.
- E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 FINAL CLEANING

- A. Employ experienced workers or professional cleaners for final cleaning; clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program.
- B. Use cleaning materials that are nonhazardous.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean debris from roofs, gutters, downspouts, and drainage systems.
- E. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
- F. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

- G. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
- H. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
- I. Remove tools, construction equipment, machinery, and surplus material from Project site.
- J. Remove snow and ice to provide safe access to building.
- K. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- L. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- M. Sweep concrete floors broom clean in unoccupied spaces.
- N. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- O. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- P. Remove labels that are not permanent.
- Q. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - 2. Revise seven subparagraphs below to suit Project. Check for conflict or duplication with provisions in other Sections, particularly Divisions 20 through 29.
- R. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- S. Replace parts subject to unusual operating conditions.
- T. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- U. Clean exposed surfaces of diffusers, registers, and grills.
- V. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- W. Leave Project clean and ready for occupancy.

SECTION 01 71 23 – FIELD ENGINEERING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Requirements of the General Provisions apply to all work under this section.
- B. General Conditions of the Baltimore County Board of Education's Specifications for the Site Development.
- C. Baltimore County Department of Public Works Standard Details for Construction dated 2007 and as amended.
- D. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Architect for consideration. Those judged to be equal to that specified will receive written approval.

1.2 SUMMARY

Work included: Provided at the Contractor's expense, such field engineering services as are required for proper completion of the Work including, but not necessarily limited to:

- A. The Contractor shall have property lines located and marked and corners set by a certified land surveyor. Permanent corner markers shall be installed where they do not already exist.
- B. The Contractor shall be responsible for all stakeouts and elevation checks required for construction. All such Work shall be performed by a professional land surveyor. The surveyor shall verify adequacy of benchmarks before starting construction.
- C. Before the start of any building construction, the Contractor shall have a professional land surveyor locate and stake building corners, driveway entrances, driveways, parking areas and playfields. If there are any discrepancies between the actual layout and the project site plan, they shall be brought to the attention of the Architect and resolved before Work proceeds. A building and site stake out drawing stamped and signed by a professional land surveyor may be submitted in lieu of this preliminary stake out.
- D. After the corners of the exterior walls have been started, the Contractor shall obtain a wall check survey certificate made by a professional land surveyor. This survey shall show the accurate location of the building with reference to property lines.
- E. After the first sections of slab-on-grade have been placed in the school building, the Contractor shall have a professional land surveyor verify and record the finish floor elevation on the wall check survey.
- F. At the end of the project, the Contractor shall have a professional land surveyor prepare an asbuilt survey showing the accurate horizontal and vertical locations of all building corners,

paved areas, sidewalks, utilities, fencing, site walls stormwater management facilities in accordance with the requirements of Baltimore County, etc. located within the project area.

- G. The contractor will be responsible for scheduling the Owner's independent testing agent (ITA) during construction of the stormwater management facility and insuring that the ITA completes the necessary stormwater checklist(s) during construction.
- H. A complete stormwater management as-built shall also be completed in accordance with Baltimore County's Standard Stormwater Management checklist. The Contractor's shall have a professional land surveyor prepare and certify as-built survey, and the testing and inspection agent shall have thier professional engineer certify the construction checklist at the interim and final stages of stormwater management facility construction.
- I. The Contractor will be responsible for preparing and submitting to the project engineer one (1) hard copy final stormwater management facility as-built, testing and inspection checklist(s) and additional facility information in accordance with the requirements set forth by Baltimore County, along with a digital CAD file of the same.

1.3 RELATED WORK:

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
- B. Additional requirements for field engineering also may be described in other Sections of these Specifications.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.5 SUBMITTALS

- A. Comply with pertinent provisions of Section 01300-Submittals.
- B. Upon request of the Architect, submit;
 - 1. Data demonstrating qualifications of persons proposed to be engaged for field Engineering services.
 - 2. Documentation verifying accuracy of field engineering work.
 - 3. Certifications, signed by the Contractor's retained field engineer, certifying that elevations and locations of improvements are in conformance with requirements of the Contract Documents.

1.6 PROCEDURES

- A. In addition to procedures directed by the Contractor for the proper performance of the Contractor's responsibilities:
 - 1. Locate and protect control points before starting Work on the site.
 - 2. Preserve permanent reference points during process of the Work.
 - 3. Do not change or relocate reference points or items of the Work without specific approval from the Architect.
 - 4. Promptly advise the Architect when a reference point is lost or destroyed, or requires relations because of other changes in the Work.
 - a) Upon direction of the Architect, require the field engineer to replace reference stakes or markers.
 - b) Locate such replacements according to the original survey control.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

SECTION 017400

Cleaning Procedures for New and Major Renovation Projects

Part I: General

- See Section 00200, Paragraph 7, for term of Contract. All new and major renovations projects are required to include a school-wide cleaning prior to the first duty day for teachers at the start of a new school year. The exact dates when cleaning must begin and be completed are included in other sections of this specification. See Section 00200, Paragraph 7. This summer cleaning is absolutely required for school opening and is significantly more comprehensive than a normal contractor's "broom" clean. This procedure is meant to supplement existing cleaning requirements that may appear elsewhere written in this specification.
- 2. The Bidder is responsible for the summer cleaning of the entire school prior to the first duty day for teachers at the start of a new school year.
 - 2.1. If the Bidder's work extends over more than one summer similar cleaning is required for each summer worked, prior to the first duty day for teachers at the start of a new school year.
 - 2.2. Cleaning as described herein will be a part of the required contractor's construction schedule and phase plans as required in other specification sections.
 - 2.3. The Bidder will be held fully accountable for the **replacement cost** of any furniture, fixtures, and/or equipment that may be broken, structural damages, or otherwise made inoperable by, or during, the cleaning process.
- 3. If construction/renovation activities occur or continue during the cleaning process, the bidder shall be responsible for re-cleaning, to the satisfaction of BCPS, all disturbed areas which were previously cleaned.

Part II: Products

- 1. Cleaning Chemicals and Floor Care Products
 - 1.1. Baltimore County Public Schools has an established housekeeping and floor care programs based upon the use of specific cleaning chemicals and floor care products. Due to the green cleaning supplies law enacted by the State of Maryland, Baltimore County Public Schools has selecting environmentally preferred cleaning chemicals and floor care products for use under this contract.
 - 1.2. The approved cleaning chemicals and floor care products are as follows:
 - 1.2.1. General Purpose Cleaner
 - 1.2.1.1. Sustainable Earth #64 Neutral Multi-Use Cleaner, manufactured by Coastwide Laboratories, a Division of Staples
 - 1.2.2. Heavy Duty Cleaner
 - 1.2.2.1. Sustainable Earth #65 Heavy-Duty General Purpose Cleaner, manufactured by Coastwide Laboratories, a Division of Staples
 - 1.2.3. Carpet Cleaner
 - 1.2.3.1. Sustainable Earth #62 Carpet Cleaner Concentrate, manufactured by Coastwide Laboratories, a Division of Staples
 - 1.2.4. Graffiti Remover

- 1.2.4.1. Sustainable Earth #99 Graffiti Remover, manufactured by Coastwide Laboratories, a Division of Staples
- 1.2.5. Disinfectant
 - 1.2.5.1. Sustainable Earth #66 Disinfectant, manufactured by Coastwide Laboratories, a Division of Staples
- 1.2.6. Green Floor Finish
 - 1.2.6.1. Ultra-Glo Floor Finish (UFC075), manufactured by Ultra Chem Lab
- 1.2.7. Green Floor Stripper
 - 1.2.7.1. Ultra Stripper (ULT001), manufactured by Ultra Chem Lab
- 1.2.8. Carpet Spotter
 - 1.2.8.1. Sustainable Earth #67 Carpet Spotter, manufactured by Coastwide laboratories, a Division of Staples
- 1.3. Only those products specifically approved by BCPS may be used under this contract.
- 1.4. The use of unauthorized products will be the sole and complete responsibility of the Bidder and may be cause of dismissal and contract termination.

Part III: Execution

The Bidder is responsible for a complete cleaning using the approved cleaning chemicals and floor care products and the methods listed. Request cleaning instructions from BCPS for any other items or areas not listed below.

- 1 Floor Cleaning Procedures for Floor Surfaces
 - 1.1 Vinyl Composition Tile Floors: Throughout the building, this procedure must be followed on all vinyl tile floors. Thoroughly sweep clean all floors. Remove all debris, chewing gum, candy, tape, adhesives, and other foreign materials from the floor tile. Scrub and strip all vinyl tile floors with a floor stripper using a stripping floor pad and 175-rpm scrubbing machine. After scrubbing, rinse floor with a neutral cleaner. Once dry, apply four (4) coats of floor finish. Let floor finish dry for 24 hours and burnish floor with a 1500-rpm floor burnishing machine. Follow all other manufacturer's recommendations for use and application of the approved floor care products. For newly installed vinyl tile floors, follow tile manufacturer's recommendations for cleaning and application of floor finish.
 - 1.2 Wood Flooring: Throughout the building, this procedure must be followed on all wooden floors, to include, but not be limited to, gymnasium floors, stage floors, and wooden choral raisers. Remove all debris, chewing gum, candy, tape, adhesives, and other foreign materials from the wooden floors. Clean floor with a wet mop using a neutral cleaner. For all newly installed wooden floors and specialty dance floors, see manufacturers recommendations for proper floor preparation and finishing.
 - 1.3 Terrazzo Flooring: Throughout the building, this procedure must be followed on all terrazzo flooring. Follow the same procedures stated above for Vinyl Composition Tile Floors.
 - 1.4 Carpet Floors: Throughout the building, this procedure must be followed on all carpet flooring. Vacuum all carpeting and remove any spots and stains with a spray carpet stain remover. Clean carpeting using a stream cleaner, carpet extractor, or the rotary bonnet method. Ensure adequate ventilation for all carpeting cleaning to allow for carpeting to quickly and completely dry in order to prevent the mold and/or mildew.

- 1.5 Concrete Flooring: Thoroughly sweep clean all floors. Remove all debris, chewing gum, candy, tape, adhesives, and other foreign materials from the floor. Concrete flooring found in Technical Education / Career Technology classrooms and gymnasium locker rooms should be scrubbed using a 175-rpm scrubbing machine and rinsed with neutral general purpose cleaner.
- 1.6 Specialty Flooring: Contact the Office of Operations at 410 887-0430 for specific requirements.
- 2 Cleaning Procedures for Specific Building Elements (Throughout the Building)
 - 2.1 Furniture: Entire room contents to include, but not limited to, desks, chairs, file cabinets, tables, and all other hard surface furnishings are to be cleaned with a damp cloth and general purpose cleaner along with spot cleaning with an abrasive cleaning pad. This cleaning shall include the removal of all trash, debris, graffiti, chewing gum, candy, tape, adhesives, and other foreign materials from interiors and exteriors of each piece of furniture. Fabric covered and stuffed furniture shall be vacuumed.
 - 2.2 Interior Walls: Remove any dirt smudges with a damp cloth and general purpose cleaner. Removal all pencil and pen markings, graffiti, tape, adhesives, and other foreign materials. Wash all ceramic wall tiles and glazed block tiles, up to the ceiling, with the # 64 Neutral Multi-Use Cleaner. Dust all concrete block walls, up to ceiling, with a chemically treated dust cloth.
 - 2.3 Lockers: Remove all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from interiors and exteriors of all lockers. Wipe clean the interior and exterior of all lockers with a damp cloth and general purpose cleaner. Remove any dirt smudges with a damp cloth and # 64 Neutral Multi-Use Cleaner along with an abrasive cleaning pad.
 - 2.4 Light Fixtures: Clean all light fixtures throughout the entire building. Lower the plastic lens cover and wipe inside and outside with a chemically treated dust cloth. Clean all light diffusers with a damp cloth and # 64 Neutral Multi-Use Cleaner. Lighting should be shut off before cleaning.
 - 2.5 Windows: Clean all interior and exterior windows, including gymnasium windows and all atrium windows throughout the building, with # 64 Neutral Multi-Use Cleaner. Windows must be free of any streaking. Clean all window ledges and frames with a damp cloth and general purpose cleaner.
 - 2.6 Blinds: All existing window blinds should be dusted and wiped clean with a damp cloth and #64 Neutral Multi-Use Cleaner.
 - 2.7 Ceilings: Dust all ceilings. Expose bar joists, support beams, etc. must be dusted. Remove all debris and/or foreign material found on ceilings. Wipe clean all cleaning HVAC vents and diffusers with a damp cloth and # 64 Neutral Multi-Use Cleaner.
- 3 Cleaning Procedures for Specific Building Areas
 - 3.1 Classrooms and Offices: Wipe clean all interior and exterior doorframes, door vents, and door glass with a damp cloth and # 64 Neutral Multi-Use Cleaner. Wipe clean all countertops, chalk ledges, cabinets, clocks, sinks, bookshelves, etc with a damp cloth and # 64 Neutral Multi –Use Cleaner. Clean and disinfect all sinks, water fountains, and countertops. Wipe clean all mirrors with # 64 Neutral Multi-Use cleaner. Wash and sanitize all waste receptacles with # 66 Disinfectant. Remove all debris, chewing gum, candy, tape, adhesives, graffiti, and other foreign materials from all surfaces. Follow the applicable Floor Cleaning Procedures listed above based on the floor surface. Entire room contents including, but not limited to, desks, chairs, file cabinets, and all other hard surface furnishings to be cleaned with a damp cloth and # 64

Neutral Multi-Use cleaner along with spot cleaning with an abrasive cleaning pad. Fabric covered and stuffed furniture to be vacuumed. Vacuum and clean all area carpets.

- 3.2 Toilet Rooms: Wipe clean all walls, toilet partitions, plumbing fixtures, interior/exterior doors, and doorframes with a damp cloth and # 64 Neutral Multi-Use cleaner. Wash and sanitize all waste receptacles with # 66 Disinfectant. This cleaning shall include the removal of all trash, debris, graffiti, pencil and pen markings, chewing gum, candy, tape, adhesives, and other foreign materials from all walls and partitions. Disinfect all toilets, sinks, and urinals with # 66 Disinfectant. Use # 64 neutral Multi-Use Cleaner on mirrors. Wash and sanitize all waste receptacles with # 66 Disinfectant. Clean and scrub ceramic floors with # 64 Neutral Multi-Use cleaner. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above.
- 3.3 Library: Dust all books, bookshelves, countertops, ledges, doors, and door frames with a dust control treated cloth. Wipe clean all interior and exterior doorframes, door vents, and door glass with a damp cloth and # 64 Neutral Multi-Use cleaner. Entire room contents including, but not limited to, desks, chairs, file cabinets, and other hard surfaces to be cleaned with a damp cloth and # 64 Neutral Multi-Use cleaner along with spot cleaning with an abrasive cleaning pad. Fabric covered and stuffed furniture to be vacuumed. Wash and sanitize all waste receptacles with # 66 Disinfectant. Follow applicable Floor Cleaning Procedures listed above based on the floor surface.
- 3.4 Gymnasium / Cafeteria / Recreation Area: Vacuum all soundproof boards. Wipe block walls with a dust control treated cloth and wipe clean all perforated-glazed tiles with a damp cloth and # 64 Neutral Multi-Use cleaner. Clean all basketball backboard with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove all dust from ceiling beams and exposed roof trusses. Wipe clean all gym mats hanging on walls with # 66 Disinfectant. Pull out bleachers; sweep and wet mop; sweep area behind bleachers; and wipe clean all handrails and seating area with a damp cloth and # 64 Neutral Multi-Use cleaner. Wipe clean all cafeteria tables and seating with a damp cloth and # 64 Neutral Multi-Use cleaner. Wipe clean all cafeteria tables and seating with a damp cloth and # 64 Neutral Multi-Use cleaner. This cleaning shall include the removal of all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from all gymnasium bleachers and all cafeteria tables. Follow applicable Floor Cleaning Procedures listed above based on the floor surface.
- 3.5 Auditoriums: Vacuum soundproof boards. Wipe clean block walls with a dust control treated cloth and wipe clean all perforated glazed tile with a damp cloth and # 64 Neutral Multi-Use cleaner. Wipe clean all seating with a damp cloth and # 64 Neutral Multi-Use cleaner. This cleaning shall include the removal of all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from auditorium seating. Remove dust from stage steps, and floors with a wet mop. If stage flooring is wood, follow Floor Cleaning Procedures for Wooden Floors listed above. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above. Do not wax wooden floors.
- 3.6 Kitchens: Dust all block walls with a dust control treated cloth. Clean with # 64 Neutral Multi-Use Cleaner and disinfect with # 66 Disinfectant all glazed tile walls and partitions. Clean and scrub ceramic floors with general purpose cleaner. Clean and disinfect all sinks and countertops with # 66 Disinfectant.
- 3.7 Locker Rooms: Wipe clean block walls and all glazed tile wall with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from interiors and exteriors of all lockers. Wipe clean the interior and exterior of all lockers with a damp cloth and # 64 neutral Multi-Use cleaner. Remove any dirt smudges with a damp cloth and # 64 Neutral Multi-Use cleaner along with an abrasive-cleaning pad. Wipe clean all ceramic tile walls, partitions, plumbing fixtures, interior/exterior doors, and doorframes with a damp cloth and # 64 neutral Multi-Use cleaner. Disinfect with # 66 Disinfectant all toilets,
sinks, and urinals. Use # 64 Neutral Multi-use cleaner on mirrors. Wash and sanitize with # 66 Disinfectant all waste receptacles. Clean and scrub ceramic floors with # 64 Neutral Multi-Use cleaner. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above.

- 3.8 Storage Rooms / Mechanical Rooms / Custodial Closets: Dust all walls, shelves and ledges with a dust control treated cloth. Wipe clean all doorframes, vents and doors with a damp cloth and # 64 Neutral Multi-Use cleaner. Sweep and wet mop floors. For all other floor surfaces, follow the applicable Floor Cleaning Procedures listed above.
- 3.9 Stairwells: Dust walls with a chemically treated dust cloth. Sweep, damp mop steps with # 64 Neutral Multi-Use cleaner. Wipe handrails with a damp cloth and # 66 Disinfectant. Clean all window ledges with a damp cloth and # 64 Neutral Multi-Use cleaner. This cleaning shall include the removal of all trash, debris, graffiti, pencil and pen markings, chewing gum, candy, tape, adhesives, and other foreign materials from all walls and partitions. Follow applicable Floor Cleaning Procedures listed above based on floor surface type. Do not wax steps or non-skid floor strips.
- 3.10 Hallways: Dust ledges, fire extinguishers, wipe all water fountains with a damp cloth. Clean all interior glass partitions, windows and frames. Wipe clean all exterior doors and frames on inside with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove all trash, debris, graffiti, chewing gum, candy, tape, and other adhesives from interiors and exteriors of all lockers. Wipe clean the interior and exterior of all lockers with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove any dirt smudges with a damp cloth and # 64 Neutral Multi-Use cleaner. Remove any dirt smudges with a damp cloth and # 64 Neutral Multi-Use cleaner along with an abrasive-cleaning pad. Polish medal push-pads and kick plates. Clean all interior showcases with a damp cloth and # 64 neutral Multi-Use cleaner. Clean showcase glass with # 64 Neutral Multi-Use cleaner. Remove all gum, candy, stickers, and other debris. Clean and disinfect with # 66 Disinfectant all water fountains. Follow applicable Floor Cleaning Procedures listed above based on the floor surface.
- 3.11 Technical Education / Career Technology classrooms: Contact the Office of Operations via BCPS project manager to determine specific school requirements.
- 4 Inspections and Corrections
 - 4.1 All cleaning is subject to inspection by the area supervisory staff (senior operations supervisor) of the Office of Operations to ensure all areas are cleaned to BCPS standards before final acceptance by the BCPS project manager.
 - 4.1.1 The Bidder will address any identified problem areas immediately.
 - 4.1.2 Cleaning not addressed in a satisfactory or timely manner may be performed by BCPS staff or their subcontractors. If required, the cost for this service will be the responsibility of the bidder and will be deducted from the contract.
 - 4.1.3 BCPS reserves the right to inspect and accept the cleaning of all floors prior to the application of any floor finish. BCPS may inspection and accept each coat of floor finish to ensure that proper finish coverage occurs and that the required number of finish coats is applied.

- END SECTION 01740 -

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 WASTE MANAGEMENT REQUIREMENTS

- A. Reduce construction and demolition waste on site and minimize waste sent to landfills through implementation of Construction Waste Management Plan as required by LEED® 2009 for Schools New Construction and Major Renovations (LEED-S 2009) Rating System for Materials and Resources (MR) Credit 2. Throughout this section, the term LEED is used in place of LEED-S 2009.
- B. Divert a minimum of 75 percent from landfill by weight or volume of total non-hazardous project construction, demolition and site operations waste, excluding excavated soil and land-clearing waste.
- C. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- D. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- E. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
 - 1. Aluminum and plastic beverage containers.
 - 2. Corrugated cardboard.
 - 3. Wood pallets.
 - 4. Clean dimensional wood: May be used as blocking or furring.
 - 5. Land clearing debris, including brush, branches, logs, and stumps.
 - 6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
- F. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- G. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning or incinerating on or off project site.
 - a. Waste-to-energy cannot be utilized as a landfill diversion strategy. Only wood derived fuel can contribute to MRc2.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- H. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.2 RELATED REQUIREMENTS

- A. Section 01 30 00 Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. Section 01 35 15 LEED Certification Procedures: for additional LEED-related requirements.
- C. Section 01 50 00 Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

- D. Section 01 60 00 Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- E. Section 01 70 00 Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.
- F. Section 31 10 00 Site Clearing: Handling and disposal of land clearing debris.

1.3 **DEFINITIONS**

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Prior to any waste removal and within 30 days of Contract award, submit for approval a detailed Construction and Demolition Waste Management Plan in accordance with by LEED MR Credit 2 as outlined in this Section:
 - 1. Analysis of estimated job-site waste to be generated, including types and quantities of compostable, recyclable and salvageable materials.

- 2. Description of means and methods to achieve required diversion rate for compostable, recyclable, and salvageable materials, including those that may be donated to charitable organizations.
- 3. Identification of recycling contractors and haulers proposed for use in the project and locations accepting construction waste materials or entities providing related services.
- 4. Comingled sorting facilities: Provide end destination and intended use for all diverted materials. Provide statement that project specific diversion rates will be provided. Visual inspection is not an acceptable method of inspection for purposes of documenting percentage of comingled waste diverted from landfill.
 - a. Optional Compliance: Provide average annual recycling rate for the facility provided by the regulating local or state government authority.
- C. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
 - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 - 2. LEED Online: Complete LEED Form including the amount of recycled and salvaged construction and demolition waste to date.
 - 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 4. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
 - 5. Material Reused on Project: Include the following information for each:
 - a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
 - 6. Comingling sorting facilities: Provide summary of diversion rates, type of materials recycled and description of the end destination of the recycled materials.
 - 7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.
- D. Final Waste Management Documentation: Submit at completion of Substantial Completion and prior to contract closeout:
 - 1. All information required in Monthly Report Submittals.
 - 2. Legible copies of on-site logs, manifests, weight tickets, and receipts.

Final LEED Form uploaded to LEED Online, including appropriate documentation of total amount (by weight or volume) of diverted construction and demolition waste, and the total amount (by weight or volume) of landfilled waste excluding site clearing.
 a. MR Credit 2, Construction Waste Management.

PART 2 PRODUCTS

2.1 PRODUCT SUBSTITUTIONS

- A. See Section 01 60 00 Product Requirements for substitution submission procedures.
- B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 60 00:
 - 1. Relative amount of waste produced, compared to specified product.
 - 2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
 - 3. Proposed disposal method for waste product.
 - 4. Markets for recycled waste product.

PART 3 EXECUTION

3.1 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.
- 3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION
 - A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
 - B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
 - C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
 - D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.
 - E. Records: Maintain onsite logs for each load of materials removed from site:
 - 1. Landfill Log: Include type of material, load (by weight or volume), recycling/hauling service, date accepted by landfill, and facility fee.
 - 2. Waste Diversion: Include type of material, load (by weight or volume), recycling/hauling service, date accepted by recycling service, or non-profit receiver and facility fee.

- 3. Where comingling occurs prior to collection, track the amount of construction waste diverted from landfill based on the weight or volume of the removed co-mingled waste and provide the documentation of percentages of recycled from the sorting facility.
- F. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
 - 3. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
 - 4. Locate enclosures out of the way of construction traffic.
 - 5. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 6. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
 - 7. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
 - 8. Provide bi-lingual signage.
- G. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- H. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
 - 1. Coordinate work of recycling, composting and salvaging waste haulers with other trades.
 - 2. Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- I. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- J. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.

1.2 RELATED REQUIREMENTS

A. Section 01 29 00 - Payment Procedures.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems.
 - 9. Submit test/adjust/balance records.
 - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 11. Advise Owner of changeover in heat and other utilities.
 - 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 13. Complete final cleaning requirements, including touchup painting.
 - 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report and warranty.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

Advancement of Construction Technology	PUNCI LIS
Project:	From (A/E):
	Site Visit Date:
To (Contractor):	A/E Project Number:
	Contract For:

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Item	Room	Location		Correction/Completion	Verification
Number	Number	(Area)	Description	Date	A/E Check

Attachments

Signed by:						Date:	
Copies: Owner	Consultants		🗆				🗌 File
Convright 1996 Construct	ion Specifications Institut	ē	Pag	ve of			September 1996

SECTION 017750 – ASSET INFORMATION COLLECTION

PART I – GENERAL

1.1 DESCRIPTION

- A. Work included: To provide the operations and maintenance staff of Baltimore County Public Schools (BCPS) with the identification, information and tracking of large equipment incorporated into the Project. To provide an electronic source of the information furnished and deliver via Excel[®] spreadsheet in the format found in this Section of the Specifications (BCPS will provide the Contractor with the format in an electronic media).
- B. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

PART II – PRODUCTS

2.1 MAKE UP OF SPREADSHEET

A. The attached Excel[®] spreadsheet is for the convenience of the Contractor and indicates the required information.

2.2 CONTENTS OF SPREADSHEET

- A. The Spreadsheet shall include:
 - 1. List of all large equipment including:
 - a. Air Conditioning Units;
 - b. Air Compressors;
 - c. Air Handling Units;
 - d. Automatic Temperature Controls;
 - e. Boilers;
 - f. Chair Lifts;
 - g. Chillers;
 - h. Cooling Tower;
 - i. DX Units;
 - 1) Self-contained;
 - 2) Split;
 - j. Electrical Switchgear;
 - k. Elevators;
 - I. Fan(s):
 - 1) Exhaust;
 - 2) Return Air;
 - m. Fire Alarm Annunciation Panel (lobby);
 - n. Generators;
 - o. Heating Units;
 - p. Individual Dampers;
 - q. Kilns;

- r. Kitchen Hoods;
- s. Laundry Equipment:
 - 1) Washer;
 - 2) Dryer;
- t. Pumps:
 - 1) Electric Pumps;
 - 2) Fire Pumps;
 - 3) Geothermal Pumps;
- u. Switchgear;
- v. Tanks:
 - 1) Air;
 - 2) Fuel;
 - 3) Storage;
 - 4) Water;
- w. Unit Ventilators (Unit Vents);
- x. Water Heater(s):
 - 1) Gas; and
 - 2) Electric;
- y. Water Treatment Systems
 - 1) Boiler;
 - 2) Chiller.
- 2. The following information for each piece of equipment;
 - a. Asset Number from the Asset Barcode Tag,
 - b. Description
 - c. Location
 - d. Floor Number
 - e. Room Number
 - f. Manufacturer's Name
 - g. Model Number
 - h. Serial Number
- 3. The following information for each piece of equipment that contains a filter(s);
 - a. Change Frequency (the frequency for which the filter(s) must be changed);
 - b. Type/Style (the type or style of any and all filters for that piece of equipment);
 - c. Quantity (the quantity of filter(s) needed for that piece of equipment); and
 - d. Size (the size of all filter(s) needed for that piece of equipment).

PART III – EXECUTION

3.1 PROCESS

- A. The Contractor shall, after the approval of equipment during the Submittal phase, submit a list of equipment, as outlined in Section 2.2.A.1 above, with a total number of equipment items to the Baltimore County Public School's Project Manager, who will obtain and provide to the Contractor, the appropriate number of Asset Barcode Tags for the equipment.
- B. The final spreadsheet shall be provided by the Contractor in both electronic and hard copy formats to the Baltimore County Public Schools Project Manager on or before Substantial Completion.

3.2 PREPARATION

A. Clean equipment surfaces of substances, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants, that could impair bond of Asset Barcode Tags.

3.3 ASSET BARCODE TAG INSTALLATION

- A. Permanently affix Asset Barcode Tags on each major item of equipment indicated on the spreadsheet.
- B. Locate Asset Barcode Tags where accessible and visible preferably adjacent to the permanently affixed equipment identification labels indicating the serial, model, or manufacturer's identification numbers.

Asset	-				Manufact			Warranty Ir	Information		Filter Inforr	nation	Sector Sector
Number	Description	Location	Floor	Room #	urer	Model Number	Serial Number	Start Date	End Date	Change Frequency	Type/Style	Quantity	Size
BCPS Barcode Asset Tag Number	Fan Coil Unit 3	Above Gym Office	1st Floor	123	Trane	M1234H5R67	KKfc1238u98	2/1/2010	1/31/2012	Quarterly	Disposable Polyscrub	ω	24x24x2
BCPS Barcode Asset Tag Number	niiX	Art Room	2nd Floor	248	Masters	65029RB443	LKs238-09	3/8/2010	3/7/2012	N/A	N/A	N/A	N/A
Barcode													
Number													
BCPS													
Asset Tag													
Number													
BCPS													
Barcode													
Asset Lag													
Borodo													
Vecet Too													
Number													
BCPS													
Barcode													
Asset Tag													
Number													
BCPS													
Barcode													
Asset Tag													
Number													
BCPS													
Barcode													
Asset Tag													
										-			

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 30 00 Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
 - B. Individual Product Sections: Specific requirements for operation and maintenance data.
 - C. Individual Product Sections: Warranties required for specific products or Work.

1.3 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit six sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

- 3.1 PROJECT RECORD DOCUMENTS
 - A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.

- 5. Reviewed shop drawings, product data, and samples.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.

3.2 OPERATION AND MAINTENANCE DATA

- A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

3.4 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

- C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- D. Provide servicing and lubrication schedule, and list of lubricants required.
- E. Include manufacturer's printed operation and maintenance instructions.
- F. Include sequence of operation by controls manufacturer.
- G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- H. Provide control diagrams by controls manufacturer as installed.
- I. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- J. Lamp Submittal: Include data on all lamps labeled according to fixture type; this data shall include:
 - 1. Manufacturer.
 - 2. Lamp designation (ex. PAR38, M16, T5HO).
 - 3. Manufacturer's catalog number.
 - 4. Wattage.
 - 5. Color temperature.
 - 6. CRI.
 - 7. Beam spread.
 - 8. Initial lumens.
 - 9. Catalog spec sheet for each fixture type.
- K. Additional Requirements: As specified in individual product specification sections.

3.5 OPERATION AND MAINTENANCE MANUALS

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.

- 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
- 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
- J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.6 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.1 SUMMARY

- A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections; comply with pertinent LEED requirements.
- B. Training of Owner personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Plumbing equipment.
 - 4. Electrical systems and equipment.
 - 5. Security and audio visual systems.
 - 6. Conveying systems.
 - 7. Items specified in individual product Sections.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
 - 2. Finishes, including flooring, wall finishes, ceiling finishes.
 - 3. Fixtures and fittings.
 - 4. Items specified in individual product Sections.

1.2 SUBMITTALS

- A. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
 - 1. Format: DVD Disc.
 - 2. Label each disc and container with session identification and date.

1.3 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
 - 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 - 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 DEMONSTRATION - GENERAL

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
- B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.
- C. Demonstration may be combined with Owner personnel training if applicable.
- D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.

- 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
- 2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
 - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
- F. Coordinate demonstration and training requirements with commissioning requirements.

SECTION 01 81 13

SUSTAINABLE DESIGN REQUIREMENTS -LEED

PART 1 - GENERAL

1.1 SUMMARY

- A. This project is designed to achieve all Prerequisites and no less than 50 points under the US Green Building Council's LEED[®] 2009 for Schools New Construction and Major Renovations (LEED-S 2009) Rating System for at least a LEED Silver-level Rating. Throughout this section, the term LEED is used in place of LEED-S 2009.
 - 1. Certain LEED prerequisites and credits needed to obtain LEED certification are dependent on material selections. Compliance with LEED prerequisites and credits is a basis of evaluation substitution requests.
 - 2. Additional LEED prerequisites and credits needed to obtain indicated LEED certification are dependent on Architect's design and other aspects of the Project that are not part of the Work of Contract.
- B. Refer to LEED Scorecard accompanying this Section for LEED Prerequisites and Credits pursued for project.
- C. Contractor is responsible for all requirements of LEED Prerequisites and Credits that are contained throughout these Specifications.
- D. Contractor is not responsible for the application for LEED certification.
- 1.2 RELATED WORK SPECIFIED ELSEWHERE
 - A. Division 01 Section "Construction Waste Management and Disposal" for detailed LEED requirements to be incorporated into construction process.
 - B. Division 01 Section "Indoor Air Quality Controls" for detailed LEED requirements to be incorporated into construction process.
 - C. Division 01 Section "Volatile Organic Compound (VOC) Content Restrictions" for lowemitting materials requirements.
 - D. Division 01 Section "General Commissioning Requirements" for detailed commissioning requirements.
 - E. Divisions 03-10, 31-32 Sections for LEED requirements specific to Work of each of those Sections. These requirements may or may not include references to LEED.

1.3 REFERENCES

- A. ANSI Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools
- B. ANSI/BIFMA M7.1-2007 and ANSI/BIFMA X7.1-2007 Standard for Formaldehyde and TVOC Emissions of Low-Emitting Office Furniture Systems and Seating

- C. ASHRAE Standard 52.2-1999: Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size.
- D. ASTM C1371-04 Standard Test method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
- E. ASTM C1549-04 Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
- F. ASTM E408-71(1996)e1 Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
- G. ASTM E903-96 Standard Test Method for Solar Absorptance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- H. ASTM E1918-97 Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
- I. ASTM E1980-01 Standard Practice for Calculating Solar Reflectance index of Horizontal and Low-Sloped Opaque Surfaces.
- J. ASTM E1527-05, Phase I Environmental Site Assessment.
- K. ASTM E1903-97, Phase II Environmental Site Assessment, effective 2002.
- L. California Department of Health Services Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
- M. California Section 01350 Specification Special Environmental Requirements.
- N. Carpet and Rug Institute (CRI) "Green Label" IAQ Testing Program for Carpet Cushion.
- O. Carpet and Rug Institute (CRI) "Green Label Plus" IAQ Testing Program for Carpet.
- P. Collaborative for High Performance Schools (CHPS) "High Performance Product Database."
- Q. Energy Policy Act (EPAct) 1992 and amendments.
- R. Energy Policy Act (EPAct) 2005 (August 2005).
- S. EPA "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," PB90200288.
- T. EPA 2003 Construction General Permit provisions complying with Phase I and Phase II of the National Pollutant Discharge Elimination System (NPDES) program.
- U. EPA Office of Research and Development, Technical Approaches to Characterizing and Cleaning Up Brownfield Sites. Public Law 107-118, H.R. 2869, Small Business Liability Relief and Brownfield Revitalization Act.

- V. EPA Regulation 40CFR Part 763 as regulated by and in accordance with the Toxic Substances Control Act (TSCA), New York State Industrial Code Rule 56, and the New York City Department of Health Title 15.
- W. EPA Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices (Chapter 3).
- X. Forest Stewardship Council (FSC) Guidelines.
- Y. Greenguard Environmental Institute GREENGUARD Gold Certification
- Z. Green Seal (GC) Standard GC-03 "Anti-Corrosive Paints."
- AA. Green Seal (GS) Standard GS-11 "Paints."
- BB. Green Seal (GS) Standard GS-36 "Commercial Adhesives."
- CC. International Association of Plumbing and Mechanical Officials Publication (IAPMO) / ANSI Uniform Plumbing Code 2006 (UPC 1-2006) Section 4020, Water Conserving Fixtures and Fittings.
- DD. International Code Council, International Plumbing Code 2006, Section 604, Design of Building Water Distribution System.
- EE. IESNA Recommended Practice 33-1999: Lighting for Exterior Environments.
- FF. International Standard ISO 14021-1999 Environmental Labels and Declarations Self-Declared Environmental Claims (Type II Environmental Labeling).
- GG. Resilient Floor Covering Institute (RFCI) FloorScore Program.
- HH. Sheet Metal and Air Conditioning-General Contractors National Association (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction, Chapter 3, November 2007.
- II. South Coast Air Quality Management District (SCAQMD) Rule #1113: "Architectural Coatings."
- JJ. South Coast Air Quality Management District (SCAQMD) Rule #1168: "Adhesive and Sealant Applications."
- KK. USGBC (US Green Building Council) LEED Green Building Rating System:
 - 1. LEED Reference Guide for Green Building Design and Construction: For the Design, Construction and Major Renovations of Commercial and Institutional Buildings Including Core & Shell and K-12 School Projects, 2009 Edition, with all current addenda.
- 1.4 DEFINITIONS
 - A. BROWNFIELD: Expansion, redevelopment, or reuse of real property, which may be complicated by the presence or potential presence of a hazardous substance, pollutant or

contaminant (Public Law 107-118, H.R. 2869, Small Business Liability Relief and Brownfield Revitalization Act).

- B. BUILDING WATERPROOFING ENVELOPE: Includes materials which make up the complete waterproofing system for the building exterior.
- C. CERTIFIED WOOD: Wood grown in sustainably managed forest certified by an FSCaccredited certification agency. FSC-Certified wood products must have Chain of Custody from forest to manufacturer.
- D. CHAIN-OF-CUSTODY: Tracking procedure documenting the status of wood products from the forest to the ultimate consumer. Used to verify compliance with Forest Stewardship Council (FSC) guidelines.
- E. COMPOSITE WOOD: Products such as particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates, and door cores that are a composite of wood or plant material pressed and adhered together by synthetic resin or binder.
- F. CONSTRUCTION WASTE: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition.
- G. CORE LEARNING SPACES: Space for educational activity where primary functions are teaching and learning; where good speech communication is critical to academic achievement. These spaces include, but are not limited to, classrooms (enclosed or open plan), instructional pods or activity areas, group instruction rooms, conference rooms, libraries, offices, speech clinics, offices used for educational purposes and music rooms for instruction, practice and performance (ANSI S12.60-2002).
- H. EMISSIVITY (infrared emittance): Indication of ability of a material to shed infrared radiation.
- I. GBCI: Green Building Certification Institute provides third-party project certification and professional credentials recognizing excellence in green building performance and practice in support of the USGBC.
- J. LEED: Stands for Leadership in Energy and Environmental Design, a voluntary green building rating system created and managed by the US Green Building Council (USGBC).
- K. LEED ONLINE: GBCI project management tool where Projects are registered, tracked, and submitted to GBCI for Project Certification. Information, resources, and support are made available to registered Projects. Project team members can upload information to credit forms, submit Credit Interpretation Requests, manage key project details, and view and respond to reviewer comments.
- L. MATERIAL COST: The dollar value of materials being provided to the site, after any contractor mark-ups, separate from equipment or labor costs

- M. MERV (Minimum Efficiency Reporting Value): Standard method for comparing the efficiency of an air filter, as defined in ASHRAE 52.1-1999. Scale ranges from 1 to 16, which 16 being the most efficient at removing particles from air.
- N. NON-TOXIC: Neither immediately poisonous to humans, nor poisonous after a long period of exposure.
- O. POST-CONSUMER RECYCLED CONTENT: Waste material generated by households or by commercial industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. Recycled content is defined in accordance with ISO Standard 14021.
- P. POTABLE WATER: Water suitable for drinking and supplied from wells or municipal water systems.
- Q. PRE-CONSUMER RECYCLED CONTENT: Material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind and scrap generated in a process and capable of being reclaimed within the same process that generated it. Recycled content is defined in accordance with ISO Standard 14021.
- R. RECYCLING: Collection, reprocessing, marketing and use of materials that were recovered or diverted from solid waste stream.
- S. REGIONALLY EXTRACTED, HARVESTED, OR RECOVERED: Refers to location where material was extracted, harvested or recovered. For products containing multiple materials, each material must be calculated separately.
- T. REGIONALLY MANUFACTURED: Refers to location of final assembly of components into the building product furnished and installed by tradespeople.
- U. SALVAGE: Removal of existing materials or assemblies for re-installation or other use as directed by Owner.
- V. SEDIMENT: Soil and other debris that has been eroded and transported by storm or production run-off water.
- W. SOLAR REFLECTANCE INDEX: Measure of a material's ability to reject solar heat, as shown by a small temperature rise. It is calculated according to ASTM E1980 using material's Emittance and Reflectivity values. Standard black has an SRI of 0 and standard white has an SRI of 100.
- X. SUSTAINABLE DESIGN: Design which reduces negative effects on the environment using sound ecological, social, and economic methods, while considering the health and comfort of a building's occupants.
- Y. SUSTAINABLE FORESTRY: The practice of managing forest resources to meet the longterm product needs of humans while maintaining the biodiversity of forested landscapes. The primary goal is to restore, enhance, and sustain a full range of forest values, both economic and ecological.

- Z. TOXIC: Poisonous to humans, either immediately, or after a long period of exposure.
- AA. VENTILATION: The process of supplying and removing air to and from interior spaces by natural or mechanical means.
- BB. VOLATILE ORGANIC COMPOUNDS (VOC): Carbon compounds that participate in atmospheric photochemical reactions, (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonates, and ammonium carbonate). The compounds vaporize (become a gas) at normal room temperatures. VOC content is calculated in grams per Liter (g/L) according to 40 CFR 59, Subpart D (EPA method 24).
- CC. WASTE: Extra material or material that has reached end of its useful life in its intended use.

1.5 INFORMATIONAL SUBMITTALS

- A. General: Within 30 days of contract award, submit the following based upon Scorecard indications of LEED Credits pursued and Contractor's approach to achievement of those credits. Provide submittals indicating the following:
 - 1. Materials and Resources (MR) Credit 2: Waste Management Plan complying with Division 1 Section "Construction Waste Management and Disposal."
 - 2. MR Credit 4: List of proposed materials with recycled content.
 - a. Provide a preliminary matrix, using LEED Online Form or spreadsheet verifying that credit requirements will be met based on identified materials containing recycled content.
 - b. Indicate post-consumer recycled and pre-consumer recycled content for each product having recycled content, its source, and estimated material cost.
 - 3. MR Credit 5: List of proposed regionally manufactured and extracted, harvested, or recovered materials.
 - a. Provide a preliminary matrix, using LEED Online Form or spreadsheet, verifying that credit requirements will be met based on identified regionally manufactured and regionally extracted, harvested, or recovered materials.
 - b. Identify each regionally manufactured material, and each regionally extracted, harvest, or recovered materials, its source, and estimated material cost.
 - 4. MR Credit 7: List of proposed certified wood products.
 - a. Provide a preliminary matrix, using LEED Online Form or spreadsheet, verifying that credit requirements will be met based on identified certified wood products.
 - b. Identify each FSC-certified wood product, its source, and estimated material cost.
 - 5. Indoor Environmental Quality (IEQ) Prerequisite 3: List of proposed acoustical ceiling finish materials to be installed in all classrooms and core learning spaces.
 - 6. IEQ Credits 3.1 and 3.2: Construction Indoor Air Quality Management Plan complying with Division 01 Section "Indoor Air Quality Requirements Controls."

1.6 PRODUCT DATA SUBMITTALS

- A. General: Provide submittal information demonstrating LEED compliance as described herein.
 - 1. Highlight or circle pertinent LEED information within each submittal.

- 2. Contractor is responsible for completion and transmittal of all construction-related documentation required for LEED Certification.
- B. Material Content Data: For each LEED related product submitted for Divisions 03-10, 31-32 provide the following:
 - 1. Designation of percentages of post-consumer and pre-consumer recycled-content materials.
 - 2. Location of product manufacture and location of harvest, extraction, recovery of its primary raw materials.
 - 3. FSC-certification of sustainably harvested wood materials.
 - a. Provide vendor invoice listing each wood product on a line-item basis, FSC products identified by line-item, and material cost.
 - b. Vendor Chain of Custody number must be shown on invoice.
- C. Material Acoustical Performance: Provide Noise Reduction Coefficient (NRC) for acoustical ceiling finish materials in all classrooms and core learning spaces.
- D. Low-Emitting Materials: Provide manufacturer information as described in Division 01 Section "VOC Content Restrictions."

1.7 MONTHLY INFORMATIONAL SUBMITTALS

- A. With each Application for Payment, submit progress reports comparing actual purchasing and construction activities with LEED Implementation Plans. Provide for information only. Use LEED Online Form or spreadsheet, for the following LEED Credits sought for this Project:
 - 1. MR Credit 2: Construction Waste Management and Disposal.
 - 2. MR Credit 4: Recycled Content Materials.
 - 3. MR Credit 5: Regional Materials.
 - 4. MR Credit 7: Certified Wood Materials.

1.8 CLOSEOUT SUBMITTALS

- A. General: At completion of construction and prior to contract closeout, submit the following documentation in electronic format.
 - 1. Sustainable Sites (SS) Credit 3: Detailed narrative describing site contamination and remediation efforts undertaken by the project.
 - a. Option 1: Confirmation project site was determined contaminated by means of an ASTM E1903 Phase II Environmental Site Assessment
 - b. Option 2: Confirmation site was defined as a brownfield by a local, state, or federal government agency
 - c. Option 3: For asbestos contamination, provide documentation officially indicating property contaminated by a standard equivalent to the referenced ASTM standard, meeting intent to rehabilitate damaged sites where development is complicated by real or perceived environmental contamination above or below ground, such as a Comprehensive Asbestos Survey assessment performed in accordance with EPA Regulation 40CFR Part 763 as regulated by and in accordance with the Toxic Substances Control Act (TSCA), New York State Industrial Code Rule 56, and the New York City Department of Health Title 15

- d. Copy of comprehensive asbestos investigation, which was performed by a certified asbestos investigator.
- e. Copy of remediation documentation.
- 2. LEED Online: Final LEED Online Form and associated required documentation uploaded to LEED Online Project Database for each of the following:
 - a. MR Credit 2: As required in Division 01 Section "Construction Waste Management and Disposal."
 - b. MR Credit 4: Recycled Content.
 - c. MR Credit 5: Regional Materials.
 - d. MR Credit 7: Certified Wood.
 - e. IEQ Prerequisite 3: Minimum Acoustical Performance.
 - f. IEQ Credits 3-5: As required in Division 01 Sections "Indoor Air Quality Requirements" and "VOC Content Restrictions."

1.9 PROJECT MEETINGS

A. Include the status of LEED green building-related work on the agenda of all required regularly scheduled job-site meetings.

1.10 CONTRACTOR LEED COORDINATOR

- A. Designate one employee or consultant as the Contractor LEED Coordinator for this Project.
 - 1. Provide proof of LEED project experience or LEED Accreditation of designated LEED Coordinator within 30 days of contract award.
 - a. LEED Accredited Professional with or without specialty, or have demonstrated experience on at least one LEED Certified project.
 - 2. Maintain access to LEED Online at Project award and throughout project.
 - 3. Document all credits assigned to the Contractor.
 - 4. Attend all LEED meetings.

PART 2 - PRODUCTS

- 2.1 GENERAL
 - A. Where specifications require products to comply with LEED criteria, include product material cost toward the minimum total materials required to comply with the related LEED MR Credit.
 - B. Calculate material cost per LEED guidelines.
 - 1. Include Divisions 03-10 and 31-32 products consistently in MR Credits 4-7.
 - a. Division 12 products may be included if consistently included in MR Credits 3-7.
 - 2. Include all expenses to deliver material to the Project Site incurred by the Contractor including taxes and transportation costs.
 - 3. Exclude installation labor and equipment, mechanical, electrical and plumbing components and specialty items such as elevators.

2.2 RECYCLED-CONTENT MATERIALS

A. Provide materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes a minimum 20 percent of total materials cost per LEED guidelines for MR Credit 4.

2.3 REGIONAL MATERIALS

- A. Provide minimum 20 percent of materials that are harvested, extracted, recovered and manufactured within a 500-mile radius of project site as calculated by material cost per LEED guidelines for MR Credit 5.
- B. Refer to map below indicating 500-mile radius around Project location for guidance:



2.4 CERTIFIED WOOD MATERIALS

- A. Provide new wood-based products such that 50 percent of permanently installed woodbased materials are certified as sustainably harvested in accordance with the Forest Stewardship Council (FSC) guidelines, in compliance with LEED MR Credit 7.
 - 1. FSC Pure and FSC Mixed Credit are valued at 100 percent of product cost.
 - 2. FSC Mixed (NN) percent are valued at indicated percentage of their cost.
 - 3. FSC Recycled and FSC Recycled Credit do not contribute to this credit. These products qualify to contribute to MR Credit 4.
 - 4. FSC bamboo-based products contribute to this credit.

- B. Where FSC wood is combined with non-FSC wood in an assembly, all non-FSC wood to meet the Controlled Wood criteria of the FSC. FSC wood in assemblies with non-Controlled Wood is not eligible for this credit.
- 2.5 MINIMUM ACOUSTICAL PERFORMANCE
 - A. Provide all classrooms and core learning spaces with ceiling finish materials with Noise Reduction Coefficient (NRC) of 0.70 or higher.

PART 3 - EXECUTION (NOT USED)

LEED Schools

Project Scorecard



08/19/2016

		-	CONSULTING	9	
12 5 0 7	Sustainable Sites Possible Point	nts: 24	1	MRc6 - Rapidly Renewable Materials	1
Y ?Y ?N N			1	MRc7 - Certified Wood	1
Υ	SSp1 - Construction Activity Pollution Prevention	0	10 2 1 5	Indoor Environmental Quality	D
Y	SSp2 - Environmental Site Assessment	0			9
1	SSc1 - Site Selection	1	Y ?Y ?N N	I IFO 4 Minimum to to a fin O with Destances	_
4	SSc2 - Development Density & Community Connectivity	4	Y	IEQ01 - Minimum Indoor Air Quality Performance	0
1	SSc3 - Brownfield Redevelopment	1	Y	IEQp2 - Environmental Tobacco Smoke (ETS) Control	0
4	SSc4.1 - Alternative Transportation - Public Transportation Access	4	Y	IEQp3 - Minimum Acoustical Performance	
1	SSc4.2 - Alternative Transportation - Bicycle Storage & Changing Rooms	1		IEQC1 - Outdoor Air Delivery Monitoring	1
2	SSc4.3 - Alternative Transportation - Low Emitting & Fuel Efficient Vehicles	2		IEQc2 - Increased Ventilation	1
2	SSc4.4 - Alternative Transportation - Parking Capacity	2	1	IEQc3.1 - Construction Indoor Air Quality Management Plan - During Construction	1
1	SSc5.1 - Site Development - Protect or Restore Habitat	1	1	IEQc3.2 - Construction IAQ Management Plan - Before Occupancy	1
1	SSc5.2 - Site Development - Maximize Open Space	1	4	IEQc4 - Low-Emitting Materials	4
1	SSc6.1 - Stormwater Design - Quantity Control	1	1	IEQc5 - Indoor Chemical & Pollutant Source Control	1
1	SSc6.2 - Stormwater Design - Quality Control	1	1	IEQc6.1 - Controllability of Systems - Lighting	1
	SSc7.1 - Heat Island Effect - Nonroof	1	1	IEQc6.2 - Controllability of Systems - Thermal Comfort	1
1	SSc7.2 - Heat Island Effect - Roof	1	1	IEQc7.1 - Thermal Comfort - Design	1
1	SSc8 - Light Pollution Reduction	1	1	IEQc7.2 - Thermal Comfort - Verification	1
1	SSc9 - Site Master Plan	1	2 1	IEQc8.1 - Daylight & Views - Daylight	3
1	SSc10 - Joint Use of Facilities	1	1	IEQc8.2 - Daylight & Views - Views	1
			1	IEQc9 - Enhanced Acoustical Performance	1
6 0 0 5	Water Efficiency Possible Poin	nts: 11	1	IEQc10 - Mold Prevention	1
<u>Y ?Y ?N N</u>			6 0 0 0	Innovation & Design Possible Points:	6
Y	WEp1 - Water Use Reduction	0			-
4	WEc1 - Water Efficient Landscaping	4		IDc11 - Green Cleaning	1
4 2	WEc1 - Water Efficient Landscaping WEc2 - Innovative Wastewater Technologies	4 2		IDc1.1 - Green Cleaning	1
4 2 2 2 2	WEc1 - Water Efficient Landscaping WEc2 - Innovative Wastewater Technologies WEc3 - Water Use Reduction	4 2 4	1 1 1	IDc1.1 - Green Cleaning IDc1.2 - Open Space - Exemplary Performance SSc5.2	1 1 1
4 2 2 2 1 1	 WEc1 - Water Efficient Landscaping WEc2 - Innovative Wastewater Technologies WEc3 - Water Use Reduction WEc4 - Process Water Use Reduction 	4 2 4 1	Y Y Y N 1	IDc1.1 - Green Cleaning IDc1.2 - Open Space - Exemplary Performance SSc5.2 IDc1.3 - Low-Mercury Lighting IDc1.4 - Joint Use of Facilities Exemplary Performance	1 1 1
4 2 2 2 1 13 1 3 16	WEc1 - Water Efficient Landscaping WEc2 - Innovative Wastewater Technologies WEc3 - Water Use Reduction WEc4 - Process Water Use Reduction Energy & Atmosphere Possible Point	4 2 4 1	Y Y N N 1	IDc1.1 - Green Cleaning IDc1.2 - Open Space - Exemplary Performance SSc5.2 IDc1.3 - Low-Mercury Lighting IDc1.4 - Joint Use of Facilities, Exemplary Performance IDc2 - LEED Accredited Professional	1 1 1 1
4 2 2 2 2 1 13 1 3 16 X 2Y 2N N	WEc1 - Water Efficient Landscaping WEc2 - Innovative Wastewater Technologies WEc3 - Water Use Reduction WEc4 - Process Water Use Reduction Energy & Atmosphere Possible Point	4 2 4 1 nts: 33	Y Y Y N 1	IDc1.1 - Green Cleaning IDc1.2 - Open Space - Exemplary Performance SSc5.2 IDc1.3 - Low-Mercury Lighting IDc1.4 - Joint Use of Facilities, Exemplary Performance IDc2 - LEED Accredited Professional IDc3 - The School as a Teaching Tool	1 1 1 1 1
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4 2 2 2 2 1 13 1 3 16 Y ?Y ?N N Y 2	WEc1 - Water Efficient Landscaping WEc2 - Innovative Wastewater Technologies WEc3 - Water Use Reduction WEc4 - Process Water Use Reduction Energy & Atmosphere Possible Poir EAp1 - Fundamental Commissioning of the Building Energy Systems EAp2 - Minimum Energy Performance	4 2 4 1 nts: 33	Y Y N 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	IDc1.1 - Green Cleaning IDc1.2 - Open Space - Exemplary Performance SSc5.2 IDc1.3 - Low-Mercury Lighting IDc1.4 - Joint Use of Facilities, Exemplary Performance IDc2 - LEED Accredited Professional IDc3 - The School as a Teaching Tool Possible Points:	1 1 1 1 1
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4 2 2 2 2 1 13 1 13 1 3 16 Y Y Y Y Y Y 10 1 8	WEc1 - Water Efficient Landscaping WEc2 - Innovative Wastewater Technologies WEc3 - Water Use Reduction WEc4 - Process Water Use Reduction Energy & Atmosphere Possible Poir EAp1 - Fundamental Commissioning of the Building Energy Systems EAp2 - Minimum Energy Performance EAp3 - Fundamental Refrigerant Management EAc1 - Optimize Energy Performance EAc2 - On-site Renewable Energy	4 2 4 1 hts: 33 0 0 0 19 7	Y Y Y N 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - - 1 - -	IDc1.1 - Green Cleaning IDc1.2 - Open Space - Exemplary Performance SSc5.2 IDc1.3 - Low-Mercury Lighting IDc1.4 - Joint Use of Facilities, Exemplary Performance IDc2 - LEED Accredited Professional IDc3 - The School as a Teaching Tool Possible Points: Regional Priority Credits Possible Points: RPc1.1 - SSc4.1 RPc1.2 - SSc5.1 Protect or Restore Habitat	1 1 1 1 1 4 1
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SECTION 01 91 13 - GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Commissioning requirements common to all Sections
- B. Systems and equipment start-up and functional performance testing
- C. Validation of proper and thorough installation of systems and equipment
- D. Equipment performance verification
- E. Documentation of tests, procedures, and installations
- F. Coordination and requirements of training events
- G. Preparation and logistics of Facility Manual content
- H. Management of Record Construction Documentation
- I. Sequencing

1.2 GENERAL DESCRIPTION

- A. Commissioning (Commissioning) is the process of ensuring that all building systems are installed and perform interactively according to the design intent; that systems are efficient and cost effective and meet the Owner's operational needs; that the installation is adequately documented; and that the Operators are adequately trained. It serves as a tool to minimize post-occupancy operational problems. It establishes testing and communication protocols in an effort to advance the building systems from installation to full dynamic operation and optimization.
- B. Commissioning Authority shall work with the Contractor and the Design Engineer to direct and oversee the Commissioning process and perform functional performance testing.
- C. The Commissioning Plan outlines the commissioning process beyond the Construction Contract. The specification sections dictate all requirements of the commissioning process relative to the construction contract. The Commissioning Plan is available for reference at the request of the Contractor; however it is not part of the construction contract.
- D. This Section and other Sections of the specification details the Contractor's responsibilities relative to the Commissioning process. It expands on the Commissioning Plan, which covers the roles and responsibilities of Parties outside of the construction contract.

1.3 SCOPE

- A. This Section covers elements, requirements, procedures, and protocols common across all Divisions of the work. Requirements specific to individual Sections are generally specified in the technical specification as well as a dedicated Section for each of Divisions 22 and 26.
- B. Specific systems to be commissioned are indicated in the following Divisions of the Specification:
 - 1. Divisions 01: Conformance to the following provisions of the Commissioning requirements is required under Division 01 and this Section:
 - a. Equipment and Systems Training as required by individual sections.
 - b. Facility Manual preparation and maintenance;
 - c. Record Document preparation and maintenance.

- 2. Division 23 HVAC and Plumbing: Requirements for Commissioning are specified in Section 23 08 00 as well as in individual Div 23 Sections.
- 3. BAS: Requirements for Commissioning are specified in Section 23 09 95
- 4. Division 26 Electrical: Requirements for Commissioning are specified in Section 26 08 00 as well as in individual Div 26 Sections.

1.4 RELATED WORK AND DOCUMENTS

- A. Commissioning Plan: The Commissioning Plan outlines the commissioning process beyond the construction specification. All Contractor responsibilities are outlined in Specifications. Commissioning Plan is available to the Contractor to understand the context of their responsibilities but does not define any additional responsibilities of the Contractor
- B. Section 01 32 00 Construction Progress Documentation: Stipulates the scheduling requirement related to the Commissioning process.
- C. Section 01 33 00 Submittal Procedures: Stipulates additional copies of submittals to be submitted and refers to other sections for additional submittal requirements related to Commissioning.
- D. Section 01 40 00 Quality Requirements: Specifies the requirements for construction quality control.
- E. Section 01 50 00 Temporary Facilities and Controls: Specifies the requirements for using Owner's permanent equipment for temporary conditioning in the facility.
- F. Section 01 77 00 Closeout Procedures: Stipulates Substantial Completion and Final Completion requirements and the basic terms of the construction warranty. It also stipulates Operation and Maintenance Documentation required
- G. Section 01 79 00 Demonstration and Training: Defines the means and methods by which training programs shall occur.
- H. Section 01 91 13 General Commissioning Requirements: details the Commissioning requirements common across all divisions
- I. Section 01 91 14 Functional Testing Procedures: Outlines the generic functional testing procedures required.
- J. Individual Specification Sections: Individual sections stipulate installation, start-up, warranty, O&M documentation, and training requirements for the system or device specified in the Section.
- K. Section 23 08 00 HVAC Systems Commissioning: Details the commissioning procedures specific to HVAC (Div 23) work.
- L. Section 23 09 95 Building Automation Systems Commissioning: Details the commissioning procedures specific to the Building Automation System.
- M. Section 26 08 00 Electrical Systems Commissioning: Details the commissioning procedures specific to Division 26 work.

1.5 DEFINITIONS AND ABBREVIATIONS

A. Acceptance Phase: This is the phase of the project when the facility and its systems and equipment are inspected, tested, verified, and documented; and when most of the Functional Performance Testing and some final training occur. This will generally occur after the Construction Phase is complete (start-up and checks have been accomplished). The Acceptance Phase typically begins with certification by the contractor that the systems have

been started up in accordance with the approved protocols and the submission of the documentation of that start-up. The Acceptance Phase ends with either (the successful completion of all functional performance testing and sign off by the Commissioning Agent as well as the Owner.

- B. Action Item (AI): Any issue that requires a response, completion, corrective or additional work, or any other action. Examples include a Request for Information (RFI), a work directive, a clarification request, a to-do item, an identified deficiency, or any other like item. Action Items must be categorized as appropriate.
- C. Action List: This is a list that is maintained and updated by the CxA that includes all Action Items that relate to Commissioning activities.
- D. A/E: General reference to the Architect/Engineer lead-design entity.
- E. ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers.
- F. Automatic Temperature Controls Contractor (ATC): Contractor responsible for providing the Building Automation System and automatic temperature controls specified in fill in for specific project.
- G. Basis of Design (BOD) Document: The Basis of Design document shall respond to, and be consistent with, the performance criteria specified in the Owner Project Requirements (OPR). The BOD illustrates the means by which OPR criteria are to be achieved, documenting the assumptions and parameters used in the design, and documenting the primary thought processes or decisions made that resulted in the selected alternatives.
- H. Building Automation System (BAS): The computer-based control or automation system. May also be referred to as the FMS.
- I. ComIT: Commissioning Information Tool, as software tool used for collaborative commissioning information management.
- J. Commissioning (Commissioning): The process of ensuring that all building systems perform interactively according to the design intent, the systems are efficient and cost effective and meet the Owner's operational needs.
- K. Commissioning Authority (CxA): The Party retained by the Owner who will oversee the Commissioning process, develop and stipulate many of the Commissioning requirements, manage the Commissioning process, and ensure and validate that systems and equipment are designed, installed and tested to meet the Owner's requirements.
- L. Commissioning Coordinator (CxC): This refers to the Individual within each of the various Parties that is designated the POC for that Party relative to Commissioning activities.
- M. Commissioning Portal: This is an internet hub for the collaboration on Commissioning information. This portal will act as a hub for posting electronic information.
- N. Commissioning Specifications ('Commissioning Specs'): Includes separate Commissioning specification sections and Commissioning-related subsections of other specifications. All Contractor requirements relating to Commissioning should be conveyed within the Commissioning Specs. Commissioning Specs should be referenced but not duplicated within the Commissioning Plan (which is designed to govern non-Contractor-related issues).
- O. Commissioning Team (CxT): The group of Parties involved in the commissioning process for any given system. The Commissioning Team will include a core group involved with all systems. This core group will typically include the CxA, the Owner's Commissioning Coordinator (O/O-CxC)]and the CM's Commissioning Coordinator (CM-CxC). On any

given system, the Commissioning Team will also include the Commissioning Coordinator for the Contractor(s) responsible for the system or equipment.

- P. Contractor: As used herein, 'Contractor' is a general reference to the installing Party and can therefore refer to the CM, subcontractors, or vendors as inferred by its usage.
- Q. Construction Manager (CM): The party acting as the primary coordinator of all the major subcontractors (MC, EC, TAB, ATC, etc as applicable).
- R. Construction Phase: Phase of the project during which the facility is constructed and/or systems and equipment are installed and started. Contractor and subcontractors complete the installation, complete start-up documentation, submit O&M information, establish trends, and perform any other applicable requirements to get systems started. Contractor and Vendors my also conduct equipment specific training. The Construction Phase will generally end upon completed start-up and TAB of systems and equipment.
- S. Contract Documents: The documents governing the responsibilities and relationships between Parties involved in the design and construction of this project including (but not necessarily limited to):
 - 1. Agreements/Contracts;
 - 2. Construction Plans and Drawings;
 - 3. Specifications;
 - 4. Addenda;
 - 5. Change Orders;
 - 6. Commissioning Plan for reference only
- T. Construction Documents: Refers generally to the Contract Documents that dictate the details of the installation (all but item a. above).
- U. Deficiency: A condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents (that is, does not perform properly or is not complying with the
- V. Electrical Contractor (EC): Contractor generally responsible for Div. 26 work
- W. Facility Management System (FMS): Alternate reference to the computer based control or automation system. May also be referred to as automatic temperature control (ATC) system, direct digital control (DDC) system, building automation system (BAS), building management system (BMS), building management and control system (BMCS), digital control system (DCS), Energy Management System (EMS), Energy Management and Control System (EMCS) or System Control And Data Acquisition (SCADA) System.
- X. Facility Manual: [ONLY APPLICABLE FOR LEED ENHANCED PROJECTS] The Facility Manual is the final deliverable from the Commissioning process, and provides the information needed to understand, operate, and maintain the facility and its systems. It should be the repository of all updates and corrections as they occur (even through occupancy). The Facility Manual expands the scope of standard O&M documentation to incorporate additional information developed through the commissioning process. This is also often called a 'Systems Manual' throughout ASHRAE and LEED Commissioning references.
- Y. Factory Authorized Representative: An individual fully trained on the equipment and certified by the manufacturer to perform the respective task.
- Z. Factory Testing: Testing of equipment off-site at the manufacturer's facility may be witnessed by the members of the project team.

- AA. Field Testing by Factory Authorized Representative: On site testing of equipment conducted by a factory authorized representative.
- BB. Fire Alarm Contractor (FAC): Contractor generally responsible for the fire alarm system installation.
- CC. Formal Hand Off Meeting: This is a quality control exercise in which all contractors responsible for completing the installation and start-up of a system or equipment, along with the CxA, Owner and CM, meet to validate that the system or equipment is completed per the contract documents and ready for functional testing, and that all the start-up, verification, nameplate data, prefunctional checklists and testing documentation is complete and accurate to a functional state of completion. CM shall organize and lead the process in all cases.
- DD. Functional Acceptance: A milestone that marks the completion of the Acceptance Phase and successful completion of the FPTs by the CxA.
- EE. Functional Performance Testing (FPT): The detailed and thorough testing of the building systems and the components and equipment making up those systems. References made to FPT throughout the documents are generally inclusive of ISFPT unless specifically indicated otherwise.
- FF. General Contractor (GC): delete if CM used instead
- GG. IAQ: Indoor Air Quality
- HH. Interactive System Functional Performance Testing (ISFPT): The detailed and thorough testing of the interactions of various systems in the building. ISFPTs are considered a subset of the overall concept of FPT and therefore references made to FPT generally will include ISFPTs unless specifically indicated otherwise.
- II. Manufacturer's Representative: Either an individual in direct employ of the manufacturer of the applicable system, or an individual who is certified by that manufacturer to perform the applicable work for which the reference is made. This is synonymous with Factory Authorized Representative
- JJ. Mechanical Contractor (MC): Contractor generally responsible for Division 23 work
- KK. O&M Documentation: When a full Facility Manual is not specified, this refers to Contractor-developed documentation designed to address the needs of facilities personnel and customized for the context of the specific facility and installation. The foundation of O&M Documentation is manufacturer's literature (including 'O&M Manuals', parts lists, troubleshooting guides, etc.) as well as Contractor-developed instructions for start-up and shut-down, sequences, and other installation-specific information. O&M Documentation content is a subset of the Facility Manual, so it is common for only one or the other to be specified.
- LL. O&M Manuals: This term shall be reserved for referencing manufacturer-published O&M documents, which generally has no information specific to the specific facility. Specifications should strive for this information to be submitted in electronic form whenever possible.
- MM. Opposite Season: The season opposite that when the majority of the testing occurs.
- NN. Owner/Operator (O/O): This is a combined reference to the both the Owner and the operators of the facility
- OO. Party: Entity legally responsible for portion of work.
- PP. Point of Contact (POC): General reference to the key individual within each Party.

- QQ. Pre-Test: Preliminary testing accomplished to verify system functionality prior to placing the system/equipment into preliminary service.
- RR. Project Phases: Phases of the project include the Construction Phase, Acceptance Phase, and Warranty Phase
- SS. Project Officer (PO): Individual or entity directly employed by the Owner who is in charge of the design and construction coordination for the project.
- TT. RFI: Request for Information
- UU. Scheduled Outage: A period of time, scheduled by Owner, in which the system is out-ofservice or not to be used by occupants.
- VV. Start-Up: Refers to the quality control process whereby the Contractor verifies the proper installation of a device or piece of equipment, executes the manufacturer's starting procedures, completes the Start-Up Checklist, energizes the device, verifies that it is in proper working order and ready for dynamic testing, and completes the Start-Up Tests.
- WW. Start-Up Checklist Item: A list of items to inspect to verify proper installation of equipment or systems by the Contractor. Checklist items simply require a 'Yes/No' or 'OK/Not' response. These include primarily static inspections and procedures to prepare the equipment or system for initial operation (e.g., belt tension checked, oil levels OK, labels affixed, gages in place, sensors calibrated, etc.). Start-Up Checklist items are one component of the Start-Up Procedures (Start-Up Tests being the other).
- XX. Start-Up Procedures: Refers to the combination of Start-Up Checklists and Start-Up Tests. Start-Up Procedures are typically performed by the Contractor with or without a formal Commissioning process. The Contractor documents the start-up process by completing and submitting the Start-Up Procedures. Start-up procedures may be a combination of those prepared by the CxA, those performed included in the contractor's quality assurance process, and those required by the manufacturer. Regardless of the context of the checklist or format of the form used to documents it, the reference to Start-up Procedures includes all of the stated procedures.
- YY. Start-Up Test: This is a test that may be involved with equipment start-up. It differs from a checklist item in that it requires more than a binary (yes/no, OK, Not OK) response an observation, measurement, or sequence of events must be documented. Start-Up Tests are one component of the Start-Up Procedures (Start-Up Checklists being the other).
- ZZ. Substantial Completion: As defined in the Owner-Contractor agreement. This milestone will coincide with the Functional Acceptance of the systems. This milestone also coincides with the start of the warranty period.
- AAA. TAB: Can refer to the test, adjust, and balance process or the Testing, Adjusting, and Balancing Contractor.
- BBB. Testing Agency: An independent agency typically retained by the Contractor to perform specialized testing of systems or equipment (most commonly electrical). The Testing Agency shall be qualified and equipped to perform the testing and shall submit appropriate qualifications.
- CCC. Trending: Monitoring and recording a history of parameters typically using the building automation system.
- DDD. Vendor: Refers to the organization that sold a system or equipment to the subcontractor. This may be a branch office of the manufacture or a value added reseller.
- EEE. Warranty Period: the period defined by the construction documents where elements of the facility are under contractual warranty
- FFF. Warranty Phase: Includes the early occupancy of the building and can continue through the contractual Warranty Period and at least into the opposite season from when the facility systems were initially tested
- 1.6 REFERENCE STANDARDS
 - A. ASHRAE Guideline 1-1996, "Guideline for Commissioning HVAC Systems"
 - B. ASHRAE Guideline 4-1993, "Preparation of operating and Maintenance Documentation for Building Systems"
 - C. NEBB Procedural Standards for Building Systems Commissioning
 - D. ASHRAE Standard 110 Method for Testing Laboratory Fume Hoods
 - E. NSF 49 Class II Biosafety Cabinetry
 - F. USGBC LEED NC 3.0 Reference Package
 - G. SMACNA IAQ Guidelines for Occupied Buildings under Construction

1.7 DOCUMENTATION

- A. Contractor shall provide to the Commissioning Authority the following per the procedures specified herein and in other Sections of the specification:
 - 1. Shop Drawings and Product Data: CxA shall be provided shop drawings and submittal data for systems and equipment that will be part of the Commissioning process. Some of these submittals will be reviewed by the CxA and others are only needed for record. CxA will mark up the Submittal Register to indicate what is required.
 - a. Submittals to be Reviewed: CM shall provide the CxA one electronic copy of Shop Drawings and Product Data concurrent with distribution to the A/E. Commissioning Authority shall review and incorporate comments via the Design Engineer. CM shall then copy CxA with the reviewed submittal with A/E approval stamp.
 - b. Submittals for Record: CM shall provide to the CxA the final electronic record copy of the submittal.
 - 2. Draft Start-Up Procedures: Contractor shall assist in development of Start-up Procedures for all applicable equipment and systems along with the manufacturer's application, installation and start-up procedures. CxA will initially provide to the Contractor generic Start-up Checklists, the content of which must be reviewed by the Contractor and supplemented with manufacturer-specific requirements and the Contractor's own internal quality assurance procedures and checks. CxA will review draft and recommend approval.
 - 3. Factory Test Reports: Contractor shall provide any factory testing documentation or certified test reports required by the specifications. These shall be provided prior to Acceptance Phase.
 - 4. Schedule Updates: Issue periodic updates to the construction schedule as specified. Provide electronic copy of each update to the CxA. Contractor shall use schedule to notify Commissioning team of scheduled start-up and training activities.
 - 5. Temporary Conditioning Plan: Contractor shall provide initial Temporary Conditioning Plan for approval and then issue periodic updates to reflect actual conditions. At the completion of the Temporary Conditioning, the final plan shall be

submitted with completed maintenance records, inspection and check logs, operating logs, etc.

- 6. Action Item Response: Respond to Action Items to which Commissioning team members assign the Contractor responsibility.
- 7. Field Testing Agency Reports. Provide all documentation of work of independent testing agencies required by the specification. These shall be provided prior to Acceptance Phase.
- 8. Completed Start-Up Procedures: Completed Start-Up Procedure documentation for all applicable equipment and systems. Provide prior to the start of the Acceptance Phase. CxA will review prior to FPT.
- 9. Nameplate Data Documentation: Provide prior to the start of the Acceptance Phase.
- 10. Equipment Warrantees: Provide prior to the start of the Acceptance Phase.
- 11. Training Plan: Provide prior to the start of the Acceptance Phase.
- 12. Record Training Documentation: Provide at least 7 days prior to the start of the applicable training session. The compiled and final record training documentation will be provided by the CM within 14 days of the last training session provided under the construction contract (this will typically be the site specific controls training). This will take the form of the Training Plan supplemented with evaluations and actual dates and topics.
- 13. O&M Manual Content: Provide O&M Manual content per the requirements of this section, and Division 1 requirements. Submit at least one month prior to the beginning of the Acceptance Phase.

1.8 COMMISSIONING SEQUENCING AND SCHEDULING

- A. Refer to the sequencing illustration at the end of this Section for a conceptual graphical representation of the precedents related to the Commissioning tasks. These precedents are generally to be applied per system and/or per area. Where applicable, in order to expedite the close out of the facility, various systems can be in various stages of the commissioning process. CxA and Contractor shall cooperate to schedule the Commissioning tasks to minimize the duration of the Commissioning activities.
- B. The Commissioning will be categorized into Phases as indicated below and defined under the definitions paragraph above. Note that per schedule, different systems and/or areas may be in different phases at any given time given that the Commissioning and testing process will be integrated into the construction process:
 - 1. Construction Phase:
 - 2. Acceptance Phase:
 - 3. Warranty Phase:
- C. CxA will provide a more detailed precedent diagram in Gantt chart OR Excel format for direction of Commissioning precedents and task duration.
- D. Prior to submission of the baseline schedule, Scheduler will coordinate with the Commissioning Authority to specifically include the detailed tasks involved in the commissioning (Commissioning) process. Commissioning Authority will provide an initial "Precedent Diagram" that outlines the optimal commissioning process. Scheduler shall meet with the Commissioning Authority and the subcontractors to synthesize the Precedent Diagram with the general construction process constraints and integrate the agreed upon process into the main construction schedule. Commissioning related tasks shall be coded as such to facilitate generating a Commissioning fragnet that will be used during commissioning progress meetings.

- E. The Commissioning Precedent Schedule will outline generic Commissioning tasks with precedents or prerequisites to each task. These tasks, which will be shown generically for typical systems, will apply to many systems. Contractor shall incorporate the tasks into EACH SYSTEM. This will require a detailed track for each system and as such the scheduler must schedule and code by system as well as area. The Commissioning precedent diagram will also indicate system precedent requirements for start-up and acceptance testing. Contractor shall collaborate with the CxA to determine impacts of project phasing as applicable. Examples of enumerated tasks include:
 - 1. Preparation of draft Start-Up Procedures.
 - 2. Contractor preparation of Training Plan.
 - 3. Preparation of Facility Manual content.
 - 4. Testing Agency activities.
 - 5. Electrical Start-up by system and zone group.
 - 6. Mechanical start-up by system and zone group.
 - 7. Controls Start-up by system and zone group.
 - 8. TAB by system and zone group
 - 9. Training Events
 - 10. Functional Testing by system and zone group.
 - 11. Occupant or Regulatory Agency testing or approval process.
- F. Contractor shall completely install, thoroughly inspect, start-up, test, adjust, and balance systems and equipment. All activities shall be documented per specified procedures and progress tracked on the construction schedule. Contractor shall notify A/E, Owner, and CxA in writing that systems are complete and ready for verification and functional performance testing. CM shall schedule and conduct Formal Witnessed Start-ups of all systems and equipment in the Commissioning scope as specified below.
- G. Contractor shall notify CxA at least 14 days in advance of any tests, start-ups, or training. CxA shall witness selected tests and start-ups. Notification shall be accompanied by a schedule showing the coordinated start date and task duration and all currently open precedent requirements.
- H. Notification of utility or system outages affecting current mission shall require advance notification per applicable Division 01 section.
- I. Connections to or Interruptions of Existing Systems: Where the project entails connection to or interruption of existing functional systems that are supporting the Owner's mission, such connection activities must be shown as a milestone on the project schedule. Generally these connections will require extensive coordination and a long period of pre-notification as defined in Division 01. Owner will not accept these connections unless the connection or outage is shown as a milestone 3 months prior to the event. The schedule will not be required to pinpoint the day and time 3 months in advance, however, it shall have been accurate to +- 2 weeks. The actual notification of the exact day and time shall be processed per applicable Division 01 section.

1.9 FORMAL HAND-OFF MEETINGS

A. CM shall schedule and conduct Formal Hand–Off Meetings (FHOM) - of all systems and equipment. This is a Contractor Quality Control exercise to validate that the systems and equipment are ready for Functional Performance Testing and complete to the point represented on the start-up and prefunctional checklists. It is not intended to be a test although spot checking and validation may occur. The FHOM is not the act of starting up systems, it is the QC validation that the systems have been started to a high standard of care, the systems are complete and ready sufficiently for the functional test, and the start-up and

functional test is accurate. The FHOM should involve the responsible subcontractors and vendors, and their contractually superior entities up to the CM.

B. Notification shall be given of all FHOMs via an Action Item posted on the Portal at least two weeks in advance of the activity. CxA and Owner shall be notified and may witness these however the primary responsibility of confirmation of the represented state of the equipment lies with the CM.

1.10 ELECTRONIC RECORD SUBMITTALS

- A. Within 14 calendar days after receipt of approval from Owner and the Architect on any submittal, for equipment in Divisions 22 and 26, Contractor shall submit a final electronic version of the submittal for Owner's future asset management. These will also be incorporated into the Final electronic O&Ms provided by the Contractors.
- B. Final electronic submittals shall:
 - 1. Be originally authored in electronic media and not scanned versions with hand mark ups unless specifically approved otherwise.
 - 2. Be provided in Portable Document Format (*.pdf) with selectable text and graphics that are readable. Generally the documents shall be merged into one bookmarked document up to 500 mb. Merged documents shall use hierarchical bookmarks to form a table of contents and provide hyperlinks to the subject topic. For submittals larger than 500 mb, provide a summary document in PDF or HTML format with relative hyperlinks to the associated document files within the same directory or in directories subordinate to the summary document.
 - 3. Include all final ratings, parameters, specifications, options, etc.. In the case where the Architect returns the submittal "Approved As Noted, Resubmission Not Required" and includes mark-ups or comments that change the originally submitted ratings, parameters, specifications, options, etc., the Contractor shall correct the documents in the original electronic document prior to submitting the final electronic documents.
 - 4. Highlight the specific rating, parameter, specification, option, etc. when the original document includes multiple alternatives. For instance when a range of performance parameters are given, or various sizes are shown, or various options are listed, the applicable item shall be indicated by highlight, circle, pointer, etc..
 - 5. Not necessarily include generalized direction from the Architect that does not related to ordering and purchasing the equipment. For instance, notes like, coordinate with xxx for final motor horsepower are not to be transferred to the electronic submittal. In that example only the final coordinated sizes would be indicated.
- C. Final Electronic Submittals shall be either posted to the project web site or provided on compact disc.

1.11 COORDINATION MANAGEMENT PROTOCOLS

- A. Coordination responsibilities and management protocols relative to Commissioning are initially defined below but will be refined and documented in the Construction Phase Commissioning Kick Off meeting. Contractor shall have input in the protocols and all parties will commit to process and scheduling obligations. The CxA will record and distribute.
 - 1. Submittals and Shop Drawings: CM shall distribute these to the CxA. CxA shall edit the Systems Matrix to communicate which submittals must be forwarded.
 - 2. CxA Review Comments on Shop Dwgs: Posted on the electronic forum and a copy sent directly to the A/E and Owner PO by the CxA. A/E to consider and incorporate at their discretion.

- 3. Deficiencies Identified by the CxA: When the CxA identifies a deficiency, CxA shall make a good faith assessment of responsible parties. Those parties, and the Cx Team shall be notified of the perceived deficiency. This communication is FOR INFORMATION ONLY and is not a direction of resolve the deficiency. Contractor may accept responsibility and resolve the deficiency voluntarily. If contractor contests either the deficiency or responsibility for that deficiency, Contractor shall respond to that deficiency indicating disagreement. If responsibility is not agreed to via the Commissioning dialogue, CM shall issue a work directive or RFI via the normal contractual channels to resolve the issue.
- 4. Requests for Meetings: In general request by the contractor for a meeting with the CxA shall be routed through Owner PO who will then determine the validity. Note that every attempt should be made to deal with Commissioning issues at Commissioning Meetings.
- 5. Control Sequence Modifications: CxA shall make every attempt to thoroughly review the sequences during the submittal phase and address any issues prior to the submittal approval. However, CxA and the ATC may incorporate minor changes to the sequence during testing when it is apparent that it improves the control of the equipment but does not fundamentally change the sequence. The time required by the ATC for this type of modification is addressed in Section 23 08 00. Any and all changes must be thoroughly documented in the record documents.
- 6. Scheduling Coordination CxA shall consult directly with the CM to incorporate the Commissioning tasks in the project schedule. The process logic and integration shall ultimately be a collaboration between CM, CxA, and subcontractors. The effort will start with CxA and CM proposing initial logic. Then sub contractors will join the discussion and work out the final details, (precedent logic and durations).
- 7. Notification of Completion Milestones Contractor shall notify Owner at least two weeks prior to an anticipated Commissioning activity or Commissioning milestone (such as ready for FPT). CM CxC shall then coordinate the scheduling of the activity (as applicable) between all required parties as applicable. Notification shall be posted using the Commissioning Portal Events Module with an associated Action Item distributed to interested parties.
- 8. Action List: CxA maintains a categorized Action List which tracks the Commissioning related action items. All content of the Action List will be available to all parties who have credentials on the portal. Any party with credentials may post an Action Item. Any party that is copied on an email resulting from an Action Item posting may respond to it and contribute to the dialogue.
- 9. Start-up Checklist and Test Documents: CxA will provide initial "generic" start-up checklists to the contractor. The contractor shall review these with respect to the manufacturer specific start-up procedures and provide comments for the CxA to update and post final, vendor specific checklists. The Contractor then performs the approved Start-Up procedures and enters the results on the Project Portal. CxT subsequently spot checks the procedures and documentation. They are then included in the Commissioning Record
- 10. Functional Performance Test Documents: Functional performance tests are prepared and completed by the CxA. They are developed during the construction phase generally after completed submittals. CxA forwards the FPT procedures to the CM to be subsequently distributed by them to the subcontractors for review. Contractors approve the procedures. Throughout the Commissioning process, CxA maintains a current record of the testing procedures and keeps the documentation up to date and accessible for all to access the current progress.

1.12 CONTRACTOR RESPONSIBILITIES

- A. Construction Phase: The following delineates the commissioning-related responsibilities of the Contractor (and their subcontractors) during the Construction Phase.
 - 1. Include Commissioning requirements in price and plan for work.
 - 2. Designate a Commissioning Coordinator (CxC) from each major subcontractor with activities related to commissioning. These Commissioning Coordinators are to be the primary contacts for Commissioning activities.
 - 3. Attend Construction Phase Commissioning Kick Off Meeting. The Commissioning Coordinator and Project Manager from each major subcontractor shall attend.
 - 4. The Commissioning Coordinator shall attend all Commissioning progress meetings unless otherwise agreed to by the CxA.
 - 5. Remedy any deficiencies identified throughout construction.
 - 6. Review draft Start-Up Procedures and comment with respect to Vendor Specific startup requirements.
 - 7. TAB shall submit sample balancing forms for approval prior to starting work.
 - 8. Schedule and coordinate Commissioning efforts into the construction schedule. Incorporate the precedent diagram provided by the CxA into the construction schedule. Indicate at a minimum all tasks enumerated on the precedent diagram for all systems.
 - 9. Coordinate the work of subcontractors, vendors, manufacturers, and Testing Agencies provided with the bid, and ensure that they are informed of and are adhering to the requirements of the Commissioning process specified throughout the contract documents. Particular reference is made to providing the required O&M Documentation; to submittal of training materials and documentation of that training; to collaboration with the overall start-up and testing process; to developing comprehensive integrated procedures for scheduling and task notification and documenting them in a common format; and to electronic delivery requirements if applicable.
 - 10. Develop and submit Temporary Conditioning Plan
 - 11. Provide assistance to the CxA in preparation of the specific Functional Performance Test (FPT) procedures. Contractors, subcontractors and vendors shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests. Damage caused to equipment performed in accordance with the approved procedures will be the responsibility of the Contractor.
 - 12. Thoroughly complete and inspect installation of systems and equipment as detailed throughout Contract Documents, as required by reference or industry standards, and as specifically indicated elsewhere this section.
 - 13. Start-up, test, adjust, and balance systems and equipment prior to verification and performance testing by the Commissioning Authority. Start-up procedures shall be in accordance with Contract Documents, reference or industry standards, and specifically individual Commissioning specifications. Provide skilled technicians qualified to do the work required. Provide factory trained/authorized technicians where required by the contract documents and stated in the applicable technical section. Generally start-up and testing shall proceed from device checkout, to component checkout, to system checkout, to inter-system checkout.
 - 14. Prepare spaces with adequate security for on site contractors to store equipment. Provide secure space with 120 volt AC power for the CxA, TAB, and ATC to base their operations and store test equipment, drawings, files, and the like.

- 15. Schedule for representative space mock ups as early as possible to facilitate determining standards for close out
- 16. Record start-up and testing procedures on start-up forms or checklists and certify that the systems and equipment have been started and or tested in accordance with the requirements specified above. Each task or item shall be indicated with the party actually performing the task or procedure.
- 17. Provide skilled technicians qualified to perform the work required.
- 18. Provide factory-trained and authorized technicians where required by the Contract Documents.
- 19. Record Start-up Procedures on start-up procedure forms on the Project Portal and certify that the systems and equipment have been started and or tested in accordance with the requirements specified above. Each task or item shall be indicated with the Party actually performing the task or procedure.
- 20. Tag equipment that is started with the Individual's name and date.
- 21. Demonstrate the operation of all systems as specified.
- 22. Certify that systems have been installed and are operating per Contract Documents prior to Functional Performance Testing.
- 23. Maintain an updated set of Record Documentation as required by the Contract Documents.
- 24. Copy the CxA on indicated documentation.
- 25. Conduct and document Equipment and Systems Training events as required by this Section and Section 01 79 00, and by applicable sections of the Specifications pertaining to each piece of equipment or system.
- B. Acceptance Phase: The following delineates the commissioning-related responsibilities of the Contractor (and their subcontractors) during the Acceptance Phase.
 - 1. Assist CxA in functional performance testing. Assistance will generally include the following:
 - a. Manipulate systems and equipment to facilitate testing (as dictated in Section 01 91 14; in most cases this will entail only an initial sample).
 - b. Provide any specialized instrumentation necessary for functional performance testing. Instrumentation outside of that required to complete the work will not be required.
 - c. Manipulate BAS and other control systems to facilitate functional performance testing (as dictated Section 01 91 14; in most cases this will entail only an initial sample).
 - 2. Correct any work not in accordance with Contract Documents.
 - 3. Participate in Training Events relative to use of O&M information and the PM program.
 - 4. Maintain record documentation, and update and resubmit it after Functional Completion.
 - 5. Compensate CxA for additional site time incurred due to incompleteness of systems or equipment at time of Functional Performance Testing.
- C. Warranty Phase: The following delineates the commissioning-related responsibilities of the Contractor (and their subcontractors) during the Warranty Phase.
 - 1. Provide warranty service;
 - 2. Conduct BAS Sequence Training
 - 3. Respond to and document Warranty issues
 - 4. Participate as required in the opposite season testing;
 - 5. Correct any deficiencies identified throughout the Warranty Phase;

6. Update record documentation to reflect any changes made throughout the Warranty Phase and resubmit final Record Drawings at the close of the Warranty period.

1.13 EQUIPMENT SUPPLIER/VENDOR RESPONSIBILITIES

- A. Construction Phase: The following delineates the commissioning-related responsibilities of the Equipment Supplier (and their subcontractors) during the Construction Phase.
 - 1. Provide shop drawings and product data in hard copy and electronic format.
 - 2. Provide manufacturer's application, installation and start-up instructions within 30 days of shop drawing/product data approval.
 - 3. Where factory-authorized start-up is specified, coordinate and participate in the specified commissioning process and document start-up on the appropriate forms.
 - 4. Review and approve Functional Test Procedures affecting supplied equipment.
 - 5. Where training is to be provided by factory-authorized personnel, provide required Training Plan information including course content for approval prior to conducting the training.
 - 6. Conduct and document Equipment and Systems Training events as required by this Section and Section 01 79 00, and by applicable sections of the Specifications pertaining to each piece of equipment or system.
 - 7. Provide spare parts and materials as required by Specifications.
 - 8. Provide special tools as required by the Specifications.
 - 9. Provide Facility Manual content as required and develop project-specific O&M content as required by the Commissioning requirements.
 - 10. Provide all warranties.
- B. Acceptance Phase: The following delineates the commissioning-related responsibilities of the Equipment Supplier (and their subcontractors) during the Acceptance Phase.
 - 1. Participate in any Functional Testing Procedures required.
 - 2. Consult on issues identified relative to the supplied equipment.
- C. Warranty Phase: The following delineates the commissioning-related responsibilities of the Equipment Supplier (and their subcontractors) during the Warranty Phase.
 - 1. Provide any warranty service required to the supplied equipment as applicable with the agreement with the Contractor.
 - 2. Maintain Facility Manual content relative to supplied equipment.
 - 3. Provide technical support to the Owner's facilities personnel.

1.14 COMMISSIONING KICK OFF/COORDINATION MEETING

- A. CxA shall schedule and conduct a Commissioning coordination meeting near the beginning of construction. The following should be discussed at this meeting:
 - 1. The Commissioning Documents
 - 2. Requirements and Sequence of Commissioning
 - 3. Responsibilities of the construction parties
 - 4. Management protocols
 - 5. Required submittals
 - 6. Schedule

1.15 START-UP PROCEDURES AND DOCUMENTATION

A. Purpose: The Commissioning process requires that the normal quality control processes involved with preparing systems and equipment for operation are performed to a high standard of care and are thoroughly documented. The required commissioning-related Start-Up Procedures involve nothing additional than that which would be done for any good installation. These procedures shall be performed to all installed systems and equipment and no sampling strategy is used for the start-up process. The Commissioning process requires all Parties to collaborate to establish the optimal standard of care for starting systems and equipment. After the procedures are established, the Contractor performs them and documents them with the Start-up Procedures that are developed by the joint effort of the Contractor and the CxA.

- B. Manual Creation of Start-up Procedures: Start-up Procedures (consisting of checklists and tests as above) for each type of equipment and system shall be created by the CxA and reviewed by the Contractors prior to start-up. These may be supplemented with Vendor specific start-up forms when approved by the CxA.
- C. 'Generic' Start-Up Procedures: Refer to Sections 23 08 00 and 26 08 00 for generic Start-up Procedures for a variety of mechanical and electrical systems. The content of these Start-Up Procedures shall provide the minimally acceptable content. Prefunctional documentation will be created by the CxA. Generic refers to the fact that the protocols may be created before the shop drawings are finalized. These procedures and protocols will be those common across different manufacturers.
- D. Content of Start-Up Procedures: Start-Up Procedures shall generally include the following for each item of equipment or system (as applicable):
 - 1. Project-specific designation, location and service.
 - 2. Indication of the Party performing and documenting the Start-Up Procedure.
 - 3. Clear explanation of the inspection, test, measurement, and outcome with a Pass/Fail indication and a record of measure parameters.
 - 4. Include a checklist item indicating that all O&M instructions, Warranties, and Record Documents have been completed and submitted.
 - 5. Include a Start-up Checklist item indicating that proper maintenance clearances have been maintained.
 - 6. Include a Start-up Checklist item indicating that special tools and/or spare tools required for normal operation and maintenance were turned over to the Owner.
 - 7. Include Start-up Checklist item indicating that all required dependent or prerequisite equipment and systems were previously started successfully.
- E. Manufacturer's Requirements: Start-up Procedures shall incorporate all manufacturerspecified procedures. As applicable, include acceptance criteria specified therein. The manufacturer's start-up and checkout procedures shall be submitted to the CxA along if they are to supplement the CxA generated forms.
- F. Recording and Documentation of the Start-up: Manufacturer's start-up protocols shall be executed and forms shall be completed by a qualified/authorized technician. These shall either be produced electronically or shall be scanned and submitted electronically. Electronic documentation of Manufacturer's recommended start-up shall be linked into the applicable test in ComIT.
- G. Recording and Documentation of Prefunctional Checklists and Tests: Generally in concert with the start-up process, the ComIT prefunctional tests and checklists shall be completed by a qualified technician. The information contained in the checklists is the minimum amount of information that will be completed in the database. Even if the information is contained in the manufacturer's start-up checklists, it shall be entered for reference in the prefunctional documentation completed in ComIT. The completed documentation shall be presented and reviewed at the Formal Witnessed Start-up
- H. Related Sections and Contract Documents: Refer to the technical specifications and commissioning-related Sections for additional information.

- I. CxA Review: CxA shall review the draft Start-Up Procedures and request any additional information required to meet the Commissioning criteria. CxA will also review and spot-check procedures during Functional Performance Testing.
- J. Documentation Completion: The individual executing the startup must complete the start-up and prefunctional documentation for any given equipment and acknowledge acceptability with the indication of who did the associated task. As approved by the CxA, in some cases the subcontractor as opposed to the manufacturer's start-up technician may complete the prefunctional information in ComIT. Whether done on paper in the field or done directly into the computer, all data shall be entered into the project database.
- K. Sampling and Final Submission: All (100% of) systems are started and documented per the approved procedures and NO sampling strategy is used. Completed Start-up and prefunctional checklists for all pieces of equipment shall be submitted to Commissioning Authority prior to any associated functional performance testing. Any outstanding item shall be clearly indicated and an associated Action Item must be entered to track resolution.
- L. Owner Access: Contractor shall allow access by Owner representatives to inspect the equipment and ensure its proper operation. Owner will be allowed to affix service tags to equipment to track the proper maintenance.

1.16 FUNCTIONAL PERFORMANCE TESTING

- A. The objective of Functional Performance Testing is to demonstrate that each system is operating according to the documented Design Intent Document and Contract Documents. Functional Performance Testing facilitates bringing the systems from a state of Substantial Completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems.
- B. The logistics and procedures involved in Functional Performance Testing are outlined below and in Section 01 91 14.

1.17 DEFICIENCIES IDENTIFIED DURING FUNCTIONAL TESTING

- A. Non-Conformance. Non-conformance deficiencies identified during Functional Performance Testing shall be resolved as follows:
 - 1. The CxA will record the results of the functional test in the ComIT project database. All deficiencies or non-conformance issues shall be noted as Action Items and reported to the Owner and Contractors.
 - 2. Corrections of identified minor deficiencies may be made during the tests at the discretion of the CxA. In such cases the deficiency and associated resolution will be documented in the database.
 - 3. Every effort will be made by the CxA to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
 - 4. As tests progress and a deficiency is identified, the CxA will discuss the issue with the executing Contractor.
 - a. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it:
 - The CxA shall document the deficiency along with the Contractor's response and intentions, and they go on to another test or sequence. A copy/email of the deficiency shall be generated and provided to the Contractor and CxA. The Contractor corrects the deficiency, completes the Action Item response certifying that the issue is resolved and /or the equipment is ready to be retested, and sends it back to the CxA.

- 2) The CxA reschedules the test and the test is repeated.
- b. If there is a dispute about a deficiency, regarding whether it is a deficiency and/or who is responsible:
 - 1) The deficiency shall be documented as an Action Item with the Contractor's response and the CM will be notified. The CM will track this issue under the construction contract dispute resolution provisions.
 - 2) Final interpretive authority is with the A/E. Final acceptance authority is with the Owner.
 - 3) The CxA documents the resolution to the Action Item.
 - 4) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency, and responds to the Action Item indicating completion. The CxA reschedules the test and the test is repeated until satisfactory performance is achieved. CxA then closes the Action Item.
- B. Cost of Retesting: The cost for the CxA to retest a Start-up or Functional Performance Test shall be paid by the Contractor responsible for the deficiency. Owner shall pay the CxA directly and back charge the responsible Contractor.
- C. Failure Due to Manufacturer's Defects. If 10% or three, whichever is greater, of identical pieces of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, all identical units may be considered unacceptable by the DM. (For the purposes of defining 'identical equipment' for this Section, size or capacity alone does not constitute a difference.) In case of failure due to manufacturer's defects, the Contractor shall provide the Owner with the following:
 - 1. Manufacturer's response in writing as to the cause of the failure and proposed resolution.
 - 2. Manufacturer shall implement their proposed resolution on a representative sample of the product.
 - 3. The Owner will determine whether a replacement of all identical units or a repair is acceptable.
 - 4. Upon acceptance, the manufacturer shall replace or repair all identical items at their expense and shall extend the warranty accordingly (if the original equipment warranty had begun).
 - 5. Manufacturer shall pay the costs of all retesting necessitated by the failure.

1.18 TRAINING EVENTS

- A. General: Adequate and thorough training of the Operators and the facilities staff is vital to effective transition and early occupancy of the building. A key goal of the Commissioning Team is to ensure that this is accomplished. Contractors, Subcontractors, and Manufacturers/Vendors as specified shall prepare and conduct training sessions on the installed systems and equipment for which they are responsible. The Contractor shall be responsible for insuring all training is performed in accordance with the Contract Documents.
- B. Training Plan Document
 - 1. The Training Plan shall outline the Training Events as proposed by the Contractor, and shall be approved by the CxA. Training Plan shall summarize all equipment and systems-related training events with topics to be covered and approximate training duration.
 - 2. The Training Plan shall include at a minimum:
 - a. Topic and applicable specification section;
 - b. Scheduled date(s) for the Events(s);

- c. Location and setting (classroom or field);
- d. Lead instructor and instructors qualifications;
- e. Co-instructors and their qualifications;
- f. Training objective;
- g. Event outline/agenda;
- h. Detailed breakout of content to be presented;
- i. Anticipated duration;
- j. Required attendees for each session.
- 3. Review: CM shall compile the individual training agendas of the subcontractors and vendors and submit a comprehensive Training Plan to the CxA, Architect and the Owner for review. Contractor shall incorporate comments and requirements resulting from the review and resubmit the Training Plan prior to conducting any training sessions.
- C. Training Prerequisites: Training shall not be conducted until the subject system or equipment is operating properly and after it has been successfully started per the commissioning requirements. If Contractor wishes to schedule both Start-Up and Training on the same day/visit, Contractor shall allow enough time to fully start-up and document start-up of the systems. If the systems are not fully functioning, training will be canceled and rescheduled.
- D. Record Training Documentation: The Contractor must document all training sessions. Beyond that included in the Training Plan, documentation shall include the names of the attendees. Training shall follow handouts that list at a minimum the key points in bullet-form presentation style, and presentation handouts shall be provided even when training follows detailed written documentation. Training will not be approved unless it contains accompanying written documentation.
- E. Video Documentation: The Contractor must record all training sessions as noted in specifications.
- 1.19 O&M MANUAL CONTENT AND ORGANIZATION
 - A. Preliminary submission of the draft O&M manual shall be made within 30 days of completion of the final approved submittal, but prior to the Acceptance Phase of the project.
 - B. The format of the electronic O&M shall be as described above for the electronic record submittals.
 - C. Final submission of the O&Ms shall be as defined in applicable specification section.

1.20 TEMPORARY CONDITIONING

- A. Contractor shall only use building permanent equipment to provide temporary conditioning on the approval of the AE, Owner, and the CxA. Approval for such will only be given upon acceptance of a detailed plan provided by the individually involved subcontractors and compiled by the CM. The temporary conditioning plan shall be a required element of the Construction IAQ Management Plan required for the LEED Credit IEQ 3.1. The temporary conditioning plan shall consider/address the following at a minimum
 - 1. Indicate that the full start-up protocol as required by the specification for final acceptance will be performed for the temporary start-up. Temporary conditioning plan shall include the start-up forms to be used which will be the same as those that will be used for final start-up.
 - 2. Contractor shall address how equipment will be maintained in good, clean condition. Specifically address:

- a. Temporary filtering of air: Air Filters used for construction shall be at least that specified for final use. Contractor shall remove construction filters and replace with new filters at substantial completion. Filters shall be maintained and replaced at the specified final pressure drop. Contractor shall install a magnehelic for visual indication of pressure drop as well as set up the loaded filter DP switch for monitoring on the BAS.
- b. Temporary Filtering of Water and Condensate: Construction strainers shall be used while circulating fluid during construction. Strainer shall be finer than specified for final strainers.
- c. Sealing/Filtering of Open Ducts: Address that all open ducts shall be either sealed or protected with filter media. Generally return or exhaust systems shall not be used during construction unless otherwise approved.
- d. Lubrication and Maintenance: Contractor shall maintain the systems and equipment in accordance with the manufacturer's instructions. Contractor shall coordinate lubricants used with Owner's operators. Frequency of lubrication and inspection shall be as recommended by manufacturer's literature. Applicable maintenance lubrication schedules shall be included in the plan. Draft maintenance logs shall be submitted with plan and completed as maintenance is performed.
- e. Operation outside of Normal ranges: Systems and equipment shall not be operated outside the range of specified conditions. Plan shall address how the contractor will ensure that operation will not harm the equipment
- f. Emergency Condition Identification and Response protocols: Plan shall address protocols for responding to equipment malfunctions and or harmful operation. Automatic safeties and remote enunciation shall be in place to protect people and property. Temporary operation shall not be allowed until there is an automatic communication/enunciation medium such as a phone connection or an internet connection. At a minimum, an alarm on the equipment used for temporary service shall be automatically sent to the contractor's 24 hour monitoring service and to the Owner's help desk. The contractor shall respond to and be responsible for securing conditions within the building. Owner shall assess the situation and as necessary secure utilities feeding the building from isolation points outside of the building.
- 3. Campus Utility Impact: The plan shall address the expected impact on the campus utilities involved in the temporary conditioning equipment. Specifically address:
 - a. How the systems will be controlled to both ensure they are operating in range, and to avoid energy waste or inefficient conditions.
 - b. Project the range of loads and flows to be imposed on the campus systems. For cooling, indicated how you will ensure a temperature split of at least 8C.
 - c. For campus chilled water connections, the bridge connection and automatic control of the bridge related sequences shall be installed, functional and tested.
- 4. Building Protection: Address how the system will be controlled to avoid humidity conditions that will either promote mold growth or cause corrosion.
- 5. Equipment Reconditioning: Address with specific means and methods how the equipment used for temporary conditioning will be re-conditioned to new condition. Belts, seals, bearings, couplings, or other parts that wear more than 3% of their expected life shall be replaced.
- 6. Cleaning: Address how ducts, pipes, coils, converters, air handling equipment, terminal units, etc. shall be cleaned at final turn over.

- 7. Operations Log: Contractor responsible for operating the equipment shall maintain a log of all activities associated with operating and maintaining equipment. Log shall be submitted to Owner on a frequency specified by them.
- 8. Operating System Alterations: Plan shall address specific protocol for doing work the systems
- 9. Any material, device, component, equipment, etc. that is assessed as damaged or as having a substantially shortened life as a result of temporary conditioning operation shall be replaced by the contractor at no cost to the contract.
- 10. Segregation: Where only portions of a system are to be used, contractor shall specifically indicate how the used portion will be isolated from the unused portion. Plan shall address how to ensure that the reduced operation condition will be maintained within acceptable ranges, and/or how capacity will be throttled to keep all operating parameters in recommended ranges.

1.21 CONNECTION TO OR INTERRUPTION OF EXISTING SERVICES

- A. Contractor shall exercise great care in the connection to or interruption of existing functional services (utilities, systems, spaces, etc.) that support the Owner's mission. This shall only be done with advance notification, completion of Owner documentation to obtain approval, and final approval and supervision by the Owner.
- B. Refer to applicable Division 01 sections for logistics and requirements for connection to or interruption of existing services
- C. All events where an existing service will be connected to or interrupted shall be itemized as a milestone or task in the construction Commissioning schedule. Owner will not approve the connection or interruption unless the event has been forecasted for at least three months. The schedule will not serve as the final notification but will support planning.
- D. Final notification shall be per the Owner's process with all forms and submissions complete and accurate. Owner shall provide information on processes and applicable forms on request.
- E. Depending on the service, Owner may dictate that the interruption be during non-working hours. In other cases, Owner will require the interruption be during working hours so mission can be monitored.
- F. Contractor shall summarize the potential impact and the maximum duration
- G. Owner reserves the right to cancel the connection or interruption at any time if it circumstances necessitate this. The Owner also reserves the right to constrain the extent of any interruption.
- H. Connections to Hydronic Systems:
 - 1. Connections to existing Hydronic systems shall be done only on mutual written approval of both parties to the connection. Owner and contractor shall review the fluid and piping condition and any applicable treatment and/or water analyses of the other parties system and agree to the connection.
 - 2. Contractor shall work with the Owner to ensure the balance of the existing Hydronic system is not affected to the extent that it will affect mission. Therefore the contractor shall attempt to plan connections or interruptions for times when the impact will be the least.
 - 3. Contractor shall record the balance of the existing system before and after the connection to document the impact. Balancing adjustments of the combined system

shall commence immediately upon connection unless approved otherwise by the Owner.

- 4. Contractor shall work with the Owner to ensure any applicable pumps do not overload or become dead headed.
- I. Connections to Air Systems:
 - 1. Connections to existing Air systems shall be done only on mutual written approval of both parties to the connection. Owner and contractor shall review the air quality, inlets and ductwork condition and any applicable filtration of the other party's system and agree to the connection.
 - 2. Contractor shall work with the Owner to ensure the balance of the existing Air system is not affected to the extent that it will affect mission. Therefore the contractor shall attempt to plan connections or interruptions for times when the impact will be the least.
 - 3. Contractor shall record the balance of the existing system before and after the connection to document the impact. Balancing adjustments of the combined system shall commence immediately upon connection unless approved otherwise by the Owner.
 - 4. Contractor shall work with the Owner to ensure any applicable pumps do not overload or become dead headed.
- J. Connections to Electrical Systems:
 - 1. Connections to existing Electrical systems shall be done only on mutual written approval of both parties to the connection. Owner and contractor shall review breaker/fuse settings, short circuit studies, load on system, and condition of the electrical systems and equipment of the other party's system and agree to the connection.
 - 2. Contractor shall work with the Owner to ensure the loading and coordination of settings are such that the connection will not affect mission. Therefore the contractor shall attempt to plan connections or interruptions for times when the impact will be the least. Contractor shall complete and document all interrupter settings and transfer switch timing per the short circuit study and design intent prior to the connection.
 - 3. Contractor shall record the loads on the existing system before and after the connection to document the impact. Interrupter adjustments on the combined system shall commence immediately upon connection unless approved otherwise by the Owner.
 - 4. Contractor shall work with the Owner to ensure any applicable distribution or generation equipment do not overload.

1.22 PHASING PLAN

- A. If contractor intends to start, run, or occupy portions of systems in phases, contractor shall submit a plan for phasing in areas/portions of systems that will be connected subsequent to the initial portions. Specifically address:
 - 1. Pipe and Duct Cleaning: indicate the configurations and protocols for isolating subsequent regions and then protecting the preceding regions when the subsequent region is cleaned/flushed and connected.
 - 2. Pipe disinfection: Indicate the plan for disinfecting each region of potable water or medical gas pipe that requires disinfection. Indicate how the preceding regions of the system will be protected when connecting subsequent regions.
 - 3. Piping Certification/Testing: Indicate the plan for certifying each region of pipe that requires certification and or testing such as laboratory gases, medical gases, and RO/DI water (testing for water quality). Indicate how the preceding regions of the

system will be protected when connecting subsequent regions. Indicate how you will verify that the certification/test results on the previous systems have not been invalidated.

4. System Modifications: Indicate the protocols for making subsequent changes to the systems of pipe and duct when the systems have already been cleaned, flushed, pressure tested, disinfected, certified, etc.

PART 2 PRODUCTS

2.1 INSTRUMENTATION

- A. General: All testing equipment used in the commissioning process shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. All equipment shall be calibrated according to the manufacturer's recommended intervals. Calibration tags shall be affixed or certificates readily available.
- B. Standard Testing Instrumentation: Standard testing instrumentation normally used for performance assessment and diagnosis will be provided by the CxA. Refer to Sections 23 08 00 and 26 08 00 for a list of applicable test equipment.
- C. Special Tools: Special equipment, tools and instruments (only available from a vendor, and specific to a piece of equipment) that are required for testing equipment in accordance with these Contract Documents shall be included in the base bid price to the Contractor and turned over to the Owner upon completion of the project.

2.2 WEB-BASED COMMISSIONING PORTAL

- A. General: The Commissioning Information Tool (ComIT) is a Microsoft Access-based software program integrated with a web based Portal. It allows multiple Parties to collaborate on commissioning information management using the Internet to interact with the Portal via a browser. ComIT uses a hierarchical object tree to represent building systems, components and devices. From this object tree you can access associated information at and below the applicable level. All applicable elements of information are associated with the object tree. ComIT facilitates either completing information directly via the software or by printing forms to fill out in the field.
- B. Participation: All general and major subcontractors shall participate in the use of ComIT to document the Commissioning procedures. The use of the interface includes the electronic completion of all start-up procedures and the response/interaction with the Action List dialogue.
- C. Requirements for Use: All contractors participating in ComIT must have the following based on their use:
 - 1. Portal: This involves using the Portal via a browser. Allows anyone with credentials to view the Commissioning information. Only individuals associated with the responsible Party can edit that information. This obviously requires establishing a connection to the internet.
- D. Portal Training: Included in the contract are two half-day training sessions given by Facility Dynamics (one scheduled near the Commissioning Kickoff Meeting and one scheduled prior to the first equipment start-up). Contractors shall send a representative to at least one training session. Each Contractor is entitled to two hours phone technical support beyond training sessions. Any addition phone support for non-bug related issues beyond this will be at cost.

2.3 TEST KITS FOR METERS AND GAGES

A. Test kits for meters and gages shall be provided to the Owner new and in good condition. Previously used test kits will be unacceptable. Kits shall be submitted prior to the Acceptance Phase. Kits required are specified in the individual technical specifications and in 23 08 00 and 26 08 00:

PART 3 EXECUTION

3.1 START-UP STANDARD OF CARE

A. Procedures that establish a minimum Standard-of-Care for the start-up, check out and testing of applicable equipment are specified in the individual technical specifications as well as Sections 23 08 00, 23 09 95, and 26 08 00. Contractor shall apply this Standard-of-Care and document per the Commissioning requirements.

3.2 FUNCTIONAL PERFORMANCE TEST EXECUTION

A. Functional Performance Testing procedures are specified in Section 01 91 14. Contractor shall participate in the development and approval of the testing procedures, as well as participate as required in the initial sample of tests as indicated herein.

3.3 ACTION LIST

- A. CxA shall maintain an Action List tracking Action Items (required information, identified deficiencies, work required, etc.) that relate to Commissioning. Each item shall be tracked with the initiator, the parties responsible, due date, the date of closure, and a description of the resolution. Each item shall be categorized for sorting and tracking and for documentation on applicable forms.
- B. CxA will disseminate this list as appropriate to keep all parties informed.
- C. All parties indicated as responsible for an action item shall respond. Parties shall respond via the Web Portal interface to ensure all of the dialogue is documented in the testing database..
- D. The originator of an Action Item shall close it and record the resolution. Closing an Action Item amounts to entering the date on which it was addressed.

3.4 SEQUENCING ILLUSTRATION

A. A simplified schematic diagram of the precedents involved in the Commissioning process is provided below. The diagram is generally applicable on a system-by-system basis. Different systems or areas of the building may be phased or sequenced such that different systems are at different points in the Commissioning process. The diagram indicates tasks for the Contractor, the A/E and the CxA. Tasks for each are indicated vertically below their name. The individual tasks are as defined herein. Management protocols are also covered herein.



Sequencing Illustration END OF SECTION

SECTION 01 91 14 - FUNCTIONAL PERFORMANCE TESTING

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Functional Performance Testing of systems.
- B. Documentation of FPTs.
- C. Acceptance criteria.
- D. Interactive System Functional Performance Testing (FPT) of systems.

1.2 SCOPE

- A. This section describes the Functional Performance Testing (FPT) process, procedures, and requirements. It is intended to illustrate (i) the Contractor's requirements for assisting the Commissioning Authority (CxA) with the functional performance testing of systems, and (ii) to demonstrate the level at which systems and equipment will be tested prior to being deemed 'Acceptable' to the Owner.
- B. The CxA will prepare itemized and detailed testing plans and procedures that:
 - 1. Specify individual tests and procedures that meet the general requirements of the Cx Plan and commissioning process;
 - 2. Serve to document and record the testing procedures and the results of the tests.
- C. The Contractor shall provide technical input to the CxA as needed during the development of the final project FPTs.
- D. Example (referred herein to as 'generic') FPTs are provided as illustration to the Contractor of the level of detail to which FPTs will be conducted.

1.3 RELATED WORK AND DOCUMENTS

- A. Commissioning Plan: The Cx Plan is part of the Contract Documents and outlines many of responsibilities, procedures and tasks throughout the Cx process. It encompasses the entire Cx process including phases prior to construction and roles of all Parties. It also describes the Functional Performance Tests that will be performed during the Acceptance Phase.
- B. Section 01 91 13 General Commissioning Requirements: details the Cx requirements common across all divisions
- C. Section 01 91 14 Functional Performance Testing Procedures: Outlines the generic functional testing procedures required.
- D. Individual Specification Sections: Individual sections stipulate installation, start-up, warranty, O&M documentation, and training requirements for the system or device specified in the Section.
- E. Section 23 08 00 Mechanical Systems Commissioning: Details the commissioning procedures specific to HVAC and Plumbing work.
- F. Section 23 09 95 Building Automation Systems Commissioning: Details the commissioning procedures specific to the Building Automation System.
- G. Section 26 08 00 Electrical Systems Commissioning: Details the commissioning procedures specific to Division 26 work.

1.4 DEFINITIONS AND ABBREVIATIONS

A. Refer to Section 01 91 13.

1.5 FUNCTIONAL PERFORMANCE TESTING

- A. Objectives and Scope: Systems shall be tested to ensure proper operation through all modes of operation including normal expected operation, maintenance operation as well as proper response to system and component failures that are considered abnormal operation as indicated below.
 - 1. Normal Operation: In general, each system shall be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. These series of tests will demonstrate that the systems and equipment operate throughout typical operation including normal adjusting, cleaning, media replacement, and maintenance.
 - 2. Abnormal Operation: Test each system to simulate possible abnormal conditions and verify proper responses to such modes and conditions as power failure, equipment and component failure, freeze condition, deviation of operating parameters outside of normal, no flow, supporting utility failure, human error, etc.. This series shall demonstrate proper and safe response to the focus systems and the other systems that it affects or integrates with. These test shall also demonstrate proper enunciation of abnormal conditions to quickly and effectively notify users and operators of such condition. Specific modes required in this project are given in this section and any other sections where test requirements are found.
- B. Development of Test Procedures. CxA shall develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Prior to execution, the CxA shall provide a copy of the test procedures to the Contractor who shall review the tests for feasibility, safety, equipment and warranty protection, and scope. The CxA will also submit the tests to the A/E for review.
 - 1. Contractor shall review the FPTs in detail and approve them.
 - 2. The CxA shall review Owner-contracted testing, factory testing, or required Owner acceptance tests for which the CxA is not responsible to oversee. Review shall include content, scope, and documentation format, and shall determine what further testing or format changes may be required. Redundancy of testing shall be minimized.
 - 3. The purpose of any given specific FPT is to verify and document compliance with the stated criteria of acceptance.
- C. Scheduling: After Contractors notification that systems are ready for testing and submittal and review of all the required submittals has occurred, CM shall schedule the testing. To the extent practical, tests shall be scheduled to allow efficient and contiguous testing of interrelated systems and equipment.
- D. Phasing: Non-interdependent segments of the project testing can be phased. Actual phasing of this project will determine the systems which can be phase-tested. CxA will coordinate the scheduling with the CM and project Team.
- E. Participation: CxA will direct and conduct functional performance tests after Start-Up Procedure documentation of systems and equipment has been reviewed and accepted. Conceptual procedures for the functional performance testing are outlined elsewhere in this Section. CxA will execute the FPTs unless otherwise specified. Contractor shall assist with manipulation of the systems or equipment, provision of supporting equipment or materials

(lifts, ladders, specialty test equipment, safety equipment), and on-the-spot remediation of minor identified deficiencies whenever possible. Contractor support shall be at the direction of the CxA as follows.

- 1. The Contractors have been allotted "FPT Support Hours" in Part III of this Specification Section. This time includes only that for demonstration of the systems, at the direction of the CxA, outside of any other testing. Testing witnessed by the CxA in the presence of other various Contractors or vendors does not constitute time accrued against these hours. Similarly, start-ups, repairs, warranty, training, vendor training, any directly referenced task hours in the specifications, etc. are outside of these hours.
- 2. Time required by the Contractors to re-test failed systems, components, or integrated tests which did not meet specification in the initial testing; responding to action items; or repairing/resolving deficiencies do not count against the FPT Support Hours allotment.
- 3. The CxA will request the Contractor support in a minimum of 4-hour increments. The Contractors must supply a qualified technician or trade contractor, skilled in the respective area of systems testing, to work with the CxA. The hours used for FPT support will be tracked by the CM similar to T&M hours, and each increment of work by each technician will be approved by the CxA. If the technician/trade contractor is unable to demonstrate the systems, no time for that person will be counted for the FPT segment.
- 4. No Party involved with the project is prohibited from participation in or witnessing of any tests. Any Contractor may elect to witness all tests on their systems even if their involvement is not directly requested by the CxA. In this instance, none of the time for that person will be counted as FPT support from the pool of hours.
- 5. The FPT Support Hours are an allowance to be carried by each trade contractor as part of their base bid. Credits for unused hours or additions for additional hours will be calculated based on the unit pricing submitted as part of their bid.
- 6. CxA will endeavor to coordinate effectively with the individual Contractors throughout FPT and minimize their required involvement.
- 7. Contractor assumes responsibility for damage to systems conducted in accordance with the approved procedures.
- F. Detailed Test Procedures and Contractor Review: CxA will prepare detailed and itemized testing procedures to define and document the FPT. These will be developed during the Construction Phase and completed during the Acceptance Phase. The CxA shall submit these procedures to the Contractor for review. Contractor shall indicate all required limitations, safety procedures, maximum thresholds, and any other parameters during the FPT development. Contract shall be responsible for any damage to the equipment caused by functional performance testing done per the procedures and within the limitations of the approved procedures.
- G. Completeness: All systems must be completed and ready for FPT. All start up, factory authorized field testing, independent testing agency tests, and TAB procedures must be complete and the control systems must be tested and started for the respective system or component.
- H. Test Documentation: CxA will conduct tests, and/or witness tests as applicable. CxA will record all test results on the forms developed for the testing. CxA will 'Pass' or 'Fail' the testing and record the date and time of the test. Deficiencies shall clearly be indicated when the test is failed. When all related testing is completed successfully, CxA shall recommend acceptance of the system or component.

- I. Deficiencies and Re-Testing: When deficiencies are identified during testing, depending on their extent or magnitude, they can be corrected during the test and the testing can continue to successful completion. More significant deficiencies will require failure of the test and retesting. Deficiencies of this magnitude will result in an Action Item on the Action List. The resolution of the deficiency will then subsequently be tracked by the CxA via the Action List. All tests shall be repeated until successful completion. Refer to more specific provisions below.
- J. Sampling: Some types of identical equipment (such as terminal devices) will be tested using a sampling strategy. The sample percentage is indicated in the generic FPT provided elsewhere in this Section.
- K. Max Failure Limit and Sample Percentages: A Maximum Failure Limit is indicated along with the Sampling Percentages. The Max Failure Limit indicates the maximum percentage of the tested devices that may have any test that fails before an entirely new sample must be tested. This is based on the concept that if many failures occur, it is a result of inadequate start-up by the Contractor. When the maximum number of failures is reached, testing on that sample will be terminated and re-testing will be scheduled.
 - 1. If no Max Failure Limit is indicated, all tested samples must pass (Max Failure Limit 0%).
 - 2. Where sample tests involve multiple systems (i.e., checking strainers on different hydronic systems) the Maximum Failure Limit will apply per system.
 - 3. The responsible Contractors shall pay the CxA cost of that sample test, and redo the start-up/TAB for the applicable devices/systems.
 - 4. All work necessitated by sample failures shall be at no cost to the Owner.
- L. Opposite Season Testing: Testing procedures shall be repeated and/or conducted as necessary during appropriate seasons. Opposite Season testing will be required where scheduling prohibits thorough testing in all modes of operation. Air handler and central heating system testing for heating-related modes of operation and control loops shall be tested during outside air temperatures below 35°F.
- M. Approval. The CxA passes each test and subsequently recommends approval to Owner or CM who reviews and approves the FPT.

1.6 COORDINATION BETWEEN TESTING PARTIES.

- A. Factory Start-Ups: For many systems and equipment, Factory Start-Ups are specified. These Factory Start-Ups will be reviewed and checked during functional performance testing. All costs associated with the Factory Start-Ups are included with the bid unless otherwise noted. In general, Contractor shall make notification of when Factory Start-Ups are occurring and coordinate these with witnessing Parties. The CxA and CxT members may witness Factory Start-Ups at their discretion. Aspects of functional performance testing accomplished during the Factory Start-Ups may be accomplished and approved by the CxA if they meet the intent of the FPT.
- B. Independent Testing Agencies: For systems where Independent Testing Agencies are specified, the cost of this testing is included with the bid unless otherwise noted. Much of the testing performed by these independent agencies will cover aspects required in the Start-Up Procedures and functional performance tests.
 - 1. Contractor and testing agencies shall coordinate with the CxA so that the CxA can witness the testing and approve the applicable aspects of the FPTs.
 - 2. The CxA may in some cases independently spot-check work of the testing agencies if the tests were not witnessed. However, it is not the intent for the CxA to re-

accomplish testing by others that is specified in the construction specifications. For instance, much of the testing requirements for the electrical systems will be performed by the independent electrical testing agency provided under the bid. The CxA shall witness the indicated sample of the testing and record the results in the record of functional performance tests.

- 3. Contractor is responsible for coordinating the efforts of testing agency with that of the Cx process. Documentation shall be contiguous and seamless and duplication should be avoided. Testing agencies shall complete the documentation of the Cx process as required.
- C. Specialized Testing by Contractor: Where specialized testing is specified in the technical specifications, Contractor, subcontractor, vendor, or factory representative as applicable shall conduct the specified testing and provide all specialized instrumentation and equipment. CxA and other CxT members may witness tests at their discretion. The CxA may in some cases independently spot-check the results of the tests if the tests were not witnessed. However, it is not the intent for the CxA to re-accomplish testing that is specified in the construction specifications. All specialized testing procedures shall be integrated with the Cx process and all documentation shall be coordinated and integrated with the documentation of the Cx process. Examples of specialized testing include:
 - 1. Generator load testing (not building power outage functional testing which will be administered by CxA)
 - 2. Acceptance testing of the Fire Alarm System

1.7 FPT ACCEPTANCE CRITERIA

- A. The Acceptance Criteria shall be as follows unless more specifically indicated within individual tests. CxA may exercise professional judgment to relax requirements and pass tests and recommend approval when appropriate.
 - 1. Capacity and/or equipment performance will generally be as specified $\pm 5\%$.
 - 2. Efficiency where specifically indicated in the documents will be $\pm 5\%$. When inferred from manufacturer's catalogue data, criteria will be $\pm 10\%$.
 - 3. Balancing-related criteria will be $\pm 5\%$ for water and $\pm 10\%$ for air.
 - 4. Accuracy/repeatability on sensing devices will be as specified for the device. CxA and TAB will use calibrated gages for independent validation and use judgment in passing or failing the devices. In many cases, the coordination of multiple related sensors is more important than absolute accuracy.
 - 5. Loop response and setpoint deviation criteria will be as specified in Section 23 09 95.
 - 6. HVAC sequence-related criteria will be as explicitly specified in the documents and as interpreted by the CxA. Code required sequencing shall be per the applicable code.
 - 7. System sequences shall be as required by the approved shop drawings.
 - 8. Motor Phase Imbalance: Shall be no more than 2% (Amps and Volts).
 - 9. Noise Levels:
 - a. Occupied spaces: As indicated in the Basis of Design document. Otherwise, noise level shall be as recommended in the most current version of the ASHRAE Handbooks for the applicable occupancy.
 - b. Max 77dBa at 3' from a UPS.
 - c. Max 65dBa at 7' from an Engine Generator Set.
 - d. At limits of the enterprise or facility: As required by current local ordinances.
 - 10. Indoor Environmental Parameters (T, RH): Shall be as indicated in the Basis of Design document. Otherwise, as recommended in the most current version of the ASHRAE Handbooks for the applicable occupancy.

c.

- a. General Occupied Rooms: Setpoints from 70-75°F +- 3°F and 45% RH +- 15% RH
- b. Data Center Computer Rooms: Setpoints from 69-73°F +- 2°F and 50% RH +- 5% RH
 - Laboratories Rooms: Setpoints from 70-75°F +- 2°F and 45% RH +- 10% RH
- 11. Air Pressurization: As indicated in the Basis of Design document. Otherwise, as indicated in the most current version of the ASHRAE Handbooks for the applicable occupancy. Smoke/shaft pressurization shall be as required by NFPA to maintain maximum door opening forces and to restrict the passage of smoke.
- 12. Indoor Lighting Levels: As indicated in the Basis of Design document. Otherwise, as recommended in the most current version of the IES Handbooks for the applicable occupancy.
- 13. Electrical Systems: Shall be in accordance with manufacturer's recommendations of individual components and devices, NFPA 70B and International Electrical Testing Association (NETA) testing specifications NETA ATS-Latest Version.

PART 2 PRODUCTS

2.1 INSTRUMENTATION

- A. General: All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. All equipment shall be calibrated according to the manufacturer's recommended intervals. Calibration tags shall be affixed or certificates readily available. Supplier of instrumentation shall submit the calibration certificates along with the start up documentation.
- B. Standard Testing Instrumentation: Standard instrumentation normally used for performance assessment and diagnosis will be provided by the CxA for tests being conducted by CxA. All other instrumentation shall be provided by the Contractor. The instrumentation to be provided by the CxA may include:
 - 1. Electronic Manometer (for Air and Flow Hood)
 - 2. Electronic Manometer (for Water)
 - 3. Temperature Instruments and Gages
 - 4. Humidity Instrument and Gage
 - 5. CO2 Instrument
 - 6. Sound Meter
 - 7. Light Level Meter
 - 8. Electronic Multimeter
 - 9. Power Analyzer (including power factor and THD)
 - 10. Receptacle Tester
 - 11. Tachometer
 - 12. Belt Tensioner
 - 13. Ultrasonic Flow Meter
 - 14. Vibration meter capable of measuring acceleration peak to peak
- C. Special Tools: Special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the base bid price to the Contractor and provided to the Owner.

PART 3 FUNCTIONAL PERFORMANCE TESTS (SYSTEMS AND EQUIPMENT RELATED)

3.1 PREREQUISITES

- A. All equipment, components, and devices applicable to the FPT must be started and the Start-Up must be documented and passed. This includes completion of Start-Up Procedures, pressure testing of equipment, duct, piping; flushing/cleaning of applicable systems; completed labeling and identification; completed insulation of applicable systems; and all other requirements for placing system into dynamic operation. The completed, successful, start-up of the systems must be evidenced by the associated checks, tests, and vendor forms filled out and uploaded to the Cx Portal.
- B. Unless specifically agreed to by the Owner and CxA, all support systems shall be complete prior to FPT. For instance, an air handler will require that:
 - 1. The electrical system serving it is completed and tested;
 - 2. The hydronic systems serving it have been pressure tested, flushed, and functional performance tested;
 - 3. Balancing has been accomplished on the air and water sides;
 - 4. The control systems have been started and calibrated.
- C. The CxA shall determine the optimal sequence of testing.

3.2 FUNCTIONAL TESTING PROCESS

- A. Functional Testing on any given system shall generally begin with testing device level elements; progress to component level; to system level, to inter-system level to building level.
- B. Functional Testing of systems shall generally proceed from the utilities to the central systems, to the distribution systems, to the zone terminal units and services. CxA shall plan this process and communicate it through a precedent diagram (in Gantt and Pert or Excel format). Construction Manager shall reflect that process in the Construction Schedule. Subcontractors shall perform work in accordance with the schedule.

3.3 COMMON ELEMENTS FOR ALL SYSTEMS

- A. Required submittal documentation shall be present and located convenient to testing area. Validate that all required documentation has been submitted and is per the contract requirements.
- B. Contractor shall provide the completed Start-Up Procedures at the time of testing. CxA shall review the Start-Up Procedure documentation and spot-check at the beginning of FPT.
- C. Contractor shall demonstrate that access is sufficient to perform required maintenance.
- D. BAS trends shall have been established as required in the documents. These shall generally be reviewed prior to or during FPT.
- E. All dynamic systems powered by electricity shall be tested to simulate a power outage to ensure proper sequencing. Those on emergency power or uninterruptible power shall be tested on all sources.
- F. Capacities and adjusted/balanced conditions as applicable shall be subject to check.
- G. Sequencing Verification: All modes of operation and actions shall be verified for equipment/system samples.
- H. System and equipment configurations shall be compared against the contract documents.
- I. Verify functions (such as heating and cooling) are coordinated and do not overlap or 'fight'.

- J. All adjusted, balanced, controlled systems shall be assessed to determine the optimal setting for the system as applicable. The optimal settings should be determined to establish reliable, efficient, safe and stable operation.
- K. BAS or Local Panel Dynamic Graphics: The graphic displays for all components, systems, and areas required to be represented by a graphic shall be checked for adequacy and accuracy. Furthermore, when setpoints or other parameters are required to be adjustable, CxA shall verify that they can be adjusted directly from the graphic screen.
- L. Emergency power tests for mechanical systems will be conducted in concert with the testing of the emergency power systems. Mechanical contractor shall be available for the power outage test to test mechanical systems under a power outage. This is in addition to the requirements specified for the mechanical system.
- M. Where system and zones are designed for various modes of operations and are indicated as such in the Systems Guide, test representative systems in all modes of operation. This includes:
 - 1. Seasonal Modes
 - 2. Sequencing Modes
 - 3. Emergency Modes
 - 4. Potential configurations of containment zones.

3.4 CONTRACTOR PARTICIPATION HOURS

- A. The Trade Contractors shall include an allowance for FPT support of the demonstration of the systems, at the request of the CxA. The FPT Support Hours to be included, as part of the base bid by Trade, are as follows:
 - 1. Construction Manager FPT Support 8 hours
 - 2. Mechanical (HVAC) FPT Support 40 hours.
 - 3. Building Automation System FPT Support –80 hours
 - 4. Electrical FPT Support 16 hours
 - 5. Fire Alarm FPT Support 8 hours.
 - 6. TAB FPT Support -32 hours

END OF SECTION

SECTION 02082 - SPECIFICATIONS FOR HAZARDOUS MATERIALS ABATEMENT

1.0 GENERAL

1.1 GENERAL CONTRACTOR'S RESPONSIBILITY

- A. The Contractor is responsible for HazMat Familiarity Training for all Contractor and subcontractor personnel. All workers shall be informed of the types and locations of all Hazardous Materials at the school. HazMat Familiarity Training shall include review of contents of the Specifications For Hazardous Materials Abatement, the asbestos survey report and lead screening report, a comprehensive review of the types of known Hazardous Materials that are present at the school as well as a review of the types of suspect and unforeseen Hazardous Materials that may be encountered within hidden and concealed areas of the school. All workers shall be instructed in Stop Work Procedures. If any known, suspect, or unforeseen Hazardous Materials are encountered, they shall not be disturbed without authorization of the General Contractor's Superintendent. If the Superintendent cannot make a determination regarding the nature of a suspect Hazardous Material based on contract documents, a request for determination shall be made to the BCPS Project Manager via Request For Information (RFI). The General Contractor will assure that known or suspect Hazardous Materials are only disturbed by properly trained and licensed contractors and personnel.
- B. The Contractor shall perform surveys as work progresses to detect hazards resulting from selective demolition activities. When conducting any Contract work, the Contractor shall be responsible for asbestos-containing material (ACM) disturbances on the other side of walls, floor slabs, or ceiling decks adjacent to the immediate work space. Equipment (piping, ducting, conduit, etc.) manipulations in the work space may cause disturbances in adjacent rooms or at floor levels above or below the work space. The Contractor shall anticipate such potential disturbances and investigate conditions in adjoining areas before work begins. Conduct abatement or take other precautions, as necessary, to avoid ACM disturbance in the work space and in adjacent areas. If pre-work investigation identifies existing conditions requiring remediation, due to previous work by others, the disturbed materials shall be remediated to avoid further disturbance.
- C. Asbestos pipe and fitting insulation exists in inaccessible areas of the building structures, such as above fixed plaster and drywall ceilings, behind casework, and in hidden wall, ceiling, and other chases. As these building structures are made accessible for renovation purposes, hidden asbestos-containing materials and conditions may be revealed. At the time that the building structure is accessed, the General Contractor's Superintendent (or his designated licensed asbestos inspector) shall be present to inspect the concealed building structure(s) and determine whether unforeseen asbestos conditions are present. At all times while work is taking place within the concealed building structure, either the Superintendent or a subcontractor's senior supervisor (the most senior personnel present at the school representing that subcontractor) shall be present to ensure that no unforeseen asbestos materials or conditions are encountered. While working in these building structures, workers who are not trained to recognize asbestos materials or hazards shall not be allowed to work unsupervised. The Contractor shall be responsible for all costs of remediation if unforeseen Hazardous Materials are disturbed due to negligence or poor supervision of workers.
- D. The Contractor shall report all environmental or hazardous materials testing or sampling results to the BCPS Project Manager. A copy of laboratory reports must be submitted to the Project Manager immediately upon receipt by the General Contractor or any of his direct or indirect

subcontractors. The laboratory report shall consist of a fax copy of the laboratory report form and chain of custody form followed by a telephone call confirming fax receipt. Testing or sampling results which shall be reported include, but are not necessarily limited to, the following: asbestos bulk samples, final clearance air samples; lead-paint chip or dust wipe samples; post-sterilization water samples for bacteria, or water samples for any other contaminants.

- E. The Contractor is responsible for removal and disposal of hazardous materials by properly trained and licensed personnel.
- F. The Contractor is responsible for payment, coordination and scheduling of all Hazardous Materials Abatement work. The Hazardous Materials Abatement Contractor is to be appropriately licensed by all applicable regulatory agencies. Asbestos abatement contractors shall additionally comply with AHERA regulations, including but not limited to: an accredited labor force and an onsite accredited supervisor available at all times abatement work is occurring.
- G. All Hazardous Materials abatement work (including set-up operations, abatement, and tear-down operations) shall be scheduled at times when the school is not occupied by students or the general public. Abatement shall only take place during weekends and holidays; Christmas, Spring, and Summer Breaks. For weekend work, abatement set-up can generally be scheduled beginning at 4:00 PM on Fridays. During other holidays and breaks, abatement set-up work may begin once the school is vacant of students and the public. To facilitate scheduling abatement around the school's activity schedule, the Contractor is responsible for giving at least two weeks advanced notice to the BCPS project representative and the school. For abatement jobs requiring TEM final air clearance, on standard weekends, asbestos abatement must be completed (passed final visual inspection and encapsulated) by Saturday evening at 6:00 pm; so that final air sampling can be initiated by 9:00 pm on Saturday, and analytical results can be obtained by 7:00 am on Sunday. This will accommodate approximately 24 hours of cleaning and re-sampling after receipt of the final air sample laboratory analyses and before school opens for staff and students. For other holidays or school breaks, abatement/final-visual/encapsulation must be completed at least 36 hours proceeding school opening (9:00 pm, two days preceding the day that school starts). Abatement jobs utilizing PCM final air clearance must be completed (passed final visual inspection and encapsulated) by Midnight (two evenings before school starts); and, final air samples must be analyzed by 7:00 am (the day preceding school opening). Lead abatement or lead disturbances shall also be limited to weekends and holidays. Hazardous Materials abatement must be conducted within sealed rooms or behind plywood barriers such that work is not visible to the public, and access to work area can be secured.
- H. All materials removed for hazardous materials abatement (i.e. asbestos, lead or other abatement) shall be replaced. All pipe insulation, or other thermal system insulation materials that are removed (from active systems) shall be replaced with non-asbestos insulation materials. All other structural and/or finishing materials (i.e. flooring materials, wall/ceiling materials, fireproofing, etc.) that are removed for abatement purposes, shall be replaced with materials of equal or superior construction and aesthetic characteristics. Replacement materials shall be installed immediately or in accordance with the Owners schedule. Replacement materials and installation standards shall meet or exceed applicable Specification and industry standards. Replacement materials and schedule shall be approved by the Owner. The Contractor is responsible for all replacement/restoration costs.
 - 1. No replacement or restoration materials shall contain asbestos or asbestiform minerals in an amount greater than 0.0% as determined by transmission electron microscopy. If no commercially available material meets this criterion, written authorization for use of the

material shall be obtained from the BCPS project manager.

2. No 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.

1.2 APPLICABLE STANDARDS AND GUIDELINES

- A. The Contractor shall assume full responsibility and liability for the compliance with all applicable laws, regulations, standards, licensing requirements and patented systems pertaining to asbestos abatement, work practices, hauling, disposal and protection of workers, visitors to the work site and persons occupying areas adjacent to the work site. The Contractor shall hold harmless and indemnify the Baltimore County Public Schools (BCPS) of any liability as a result of patent infringements, failure to comply with applicable standards and licensing requirements on the part of himself, his employees or his sub-contractors.
- B. The Contractor shall have available, copies of all applicable codes, regulations, standards, documents, this specification section (*Specifications For Hazardous Materials Abatement*), the asbestos survey report, and all other related specification sections and drawings.
- C. Where conflicts among the requirements of the codes, regulations, standards, documents, specifications, and drawings exist, the most stringent requirement shall be utilized by the Contractor.

1.3 NOTIFICATION REQUIREMENTS

- A. The Contractor shall be responsible for composing and submitting to the proper authorities any required Federal, State and local asbestos abatement notification. The Contractor shall also be responsible for submitting to the proper authorities any revisions to the original notification.
- B. The Contractor shall be responsible for posting the notice of asbestos project signs at the required locations in or on the building. The Contractor shall ensure that these signs remain in place throughout the project.
- C. The Contractor shall be responsible for notifying the BCPS Project Manager 10 days prior to conducting any asbestos or lead abatement work at the school. The BCPS Project Manager must be informed at least 7 business days prior to posting Asbestos Notification signs on school property.

1.4 PROJECT DESIGN AND IMPLEMENTATION

- A. The Contractor shall be responsible for providing a project design as required by Title 40, Code of Federal Regulations, Part 763.90(g).
- B. The project design must incorporate all technical requirements of the specifications and be accepted by the BCPS Project Manager and/or BCPS' Environmental Services staff.
- C. The project shall be designed and conducted by individuals accredited to perform these functions in accordance with Title 40, Code of Federal Regulations, Part 61, Subpart E. The design must be approved by the BCPS Project Manager and/or BCPS' Environmental Services staff prior to

work commencing.

- 1. Provide the name for each "AHERA Accredited Asbestos Abatement Project Designer" that will work on the project.
- 2. Provide the name and date of hire for each "AHERA Accredited Asbestos Abatement Worker". A minimum of eight (8) workers must be submitted.
- Provide the name and date of hire for each "AHERA Accredited Asbestos Abatement Supervisor". The Contractor shall provide AHERA training certificates, and other documentation (if requested by BCPS) documenting that the Supervisor has a minimum of two (2) years experience as an AHERA Accredited Asbestos Abatement Supervisor.
- 4. Provide a copy of ALL AHERA Certificates held by each Worker, Supervisor, and Project Designer.
- 5. Provide written affirmation that all abatement Workers and Supervisors, and Project Designers are full time employees for the Abatement Contractor; that they are properly trained, experienced, and AHERA accredited employees; that they are not part time, contractual, or temporary employees; and that these are the only employees that will be used for work on the project.
- D. Provide a copy of the Abatement Company's State of Maryland License for doing asbestos abatement work.
- E. The Abatement Company must be pre-qualified by Baltimore County Department of Public Works (BCDPW) Category "I", Buildings, Classification Number 8, ("Asbestos Removal/Encapsulation") and Category "I", Buildings, Classification Number 9 (Lead Paint Abatement) prior to the date of bid opening.
- F. The Abatement Company shall have successfully completed other asbestos abatement services of similar scope and size for the owner, Baltimore County Government, and/or another school system during the past 18 months. The Abatement Company shall provide at least three (3) names of contact persons and phone numbers, as references, for these successfully completed similar asbestos abatement experiences. Abatement Companies who cannot demonstrate to the satisfaction of the BCPS Project Manager that they have had similar experiences of asbestos abatement services shall not be used on a BCPS site.
- G. The Abatement Company shall have been in business providing asbestos abatement services for a minimum of three (3) years. Businesses without three (3) years prior experience shall not be used.
- 1.5 PROJECT SUBMITTALS
 - A. For this project, the following paper work must be completed in triplicate and submitted to the BCPS Project Manager within fifteen (15) working days upon completion of the project:
 - Asbestos Abatement Information Sheets and Post Abatement Floor Plan(s). The Asbestos Abatement Information Sheets must be typed with the exception of the necessary signatures. The Asbestos Abatement Information Sheets must describe the exact locations and quantities of ACMs abated. Each abatement area must be described followed by a

description of the abatement containment method (full containment, mini containment, glove bag, or other) and a description of the abated materials and quantities for each abatement area. The Asbestos Post Abatement Floor Plan(s) must describe and depict the exact locations and quantities of ACMs abated. For each abatement area depicted on the floor plan(s), the abatement containment method (full containment, mini containment, glove bag, or other) shall be noted, and the ACM material type and quantity abated must be noted. Submit one signed original and two (2) copies of the Asbestos Abatement Information Sheets and Post Abatement Floor Plan(s). A blank set of Asbestos Abatement Information Sheets and an example completed set of Asbestos Abatement Information Sheets sub-section entitled ASBESTOS ABATEMENT FINAL REPORTS, included in this specification (Specification For Hazardous Materials Abatement). Example Post Abatement Floor Plans are not included in this specification. All abatement submittals shall be completed in a detailed fashion, similar to the attached examples.

- 2. USEPA and/or State of Maryland asbestos project notification letter(s) and variance letter(s). Submit three (3) copies.
- 3. Workers and Supervisors AHERA Training Certificates. Submit three (3) copies of the current training certificates for each worker/supervisor involved in the project.
- 4. Waste Manifest: Use the asbestos waste tracking system described under Title 40, Code of Federal Regulations 61.15 (d). Submit the signed original manifest and two (2) copies. The BCPS Project Manager must receive waste manifests within forty-five (45) days of the completion of the project.
- The Contractor shall submit Material Safety Data Sheets (MSDS) for all contractor supplies and materials provided under the terms of this Contract in accordance with OSHA Communication Standard 29 CFR 1910.101 and 29 CFR 1926.58 or any other applicable state, federal, or local regulation.
- B. Reporting unusual events: When an event of unusual and significant nature occurs at the work site (example: failure of the negative pressure system, rupture of the temporary enclosure) prepare and submit a special report outlining the circumstances of the event.
- C. Submit written results of any air monitoring conducted by or for the Contractor during the course of the project (example: OSHA compliance air monitoring).

1.6 TRAINED PERSONNEL

- A. All workers and supervisors at the work site must be accredited as per Title 40, Code of Federal Regulations, Part 763, Appendix C to Subpart E.
- B. Training courses attended by workers and supervisors to receive the required accreditation must be approved by the State of Maryland.
- C. The Contractor's on-site supervisor must be a trained competent person as per OSHA asbestos construction standard, Title 29, Code of Federal Regulations, Part 1926.58.
- D. The Contractor's on-site supervisor must be trained in the provisions of the NESHAP standard, Title 40, Code of Federal Regulations Part 61.

- E. The workers and supervisors will be required to have, at all times, on-site evidence of the required AHERA training.
- F. Workers that have not been accredited by AHERA as "Asbestos Abatement Workers" and/or workers that are not full time properly trained, experienced, and AHERA accredited employees or are part time, contractual, or temporary employees, shall not be used on BCPS projects.

1.7 USE OF SITE

- A. At no time shall Contractor's personnel be in public areas wearing protective clothing and/or respirators.
- B. At no time shall the Contractor's personnel be visible to students, staff, or the general public. All abatement work shall be separated from the view of the students, staff, and the general public by visual barriers such as closed doors, plywood barriers, or opaque poly barriers. Any windows through which abatement work can be viewed must be covered with opaque layers of poly or other visual barriers.
- C. No abatement containment poly walls shall be accessible to the students, staff, or general public during school. All poly walls must be separated from students, staff, or the public by closed and secured doors or plywood walls with padlocked doors (locked when unattended).
- D. During asbestos abatement, the doors to the affected room will be sealed in an air-tight manner and locked to prevent unauthorized entry and contamination to other parts of the building.
- E. Abatement Company deliveries, to a BCPS site, of equipment and other materials must be done with the Abatement Company present. These shall not be delivered to the site prior to the start of work, unless approved by the BCPS Project Manager.
- F. To the satisfaction of the school, the Abatement Contractor is to move and/or protect all school equipment, furnishings and occupied areas from asbestos abatement/ construction/ demolition-related debris and noise.
- G. The Abatement Contractor shall provide an abatement crew of appropriate size to minimize the abatement duration. Unless the abatement containment is too small, the Abatement Contractor shall supply a minimum crew size of eight Abatement Workers and one Supervisor at all times. Exception to this rule is also permitted if the abatement, final air sampling, and tear down will all be completed within one shift. A second day of work is permitted (for tear down) if TEM final air sampling is conducted. For all abatement jobs that take more than one shift to complete, the minimum crew sizes must be maintained at all times. For large abatement jobs and/or large containments (where the physical size of the work area does not limit the number of workers), the Abatement Contractor will supply 10, 20, 30 or more workers (as many as the containment and job site will practically accommodate) in order to meet designated deadlines and minimize abatement duration. If, at any time, the Abatement Contractor does not appear to be on schedule for timely completion (according to the scheduled deadline and the school system's needs), BCPS retains the right to require replacement of the Abatement Contractor; or, BCPS will replace the Abatement Contractor with an "On-Call" Abatement Contractor, and back-charge the General Contractor for the costs of job completion.

1.8 WORK AREA SECURITY

- A. The work area is to be restricted only to authorized, trained and protected personnel. The work area must not be accessible to the general public nor to building occupants, including maintenance and custodial personnel.
- B. Restrict entry into the work area by physically isolating the area. All means of access (doors, windows, hallways, etc.) shall be locked so as to prevent entry to the work area. Emergency exits shall not be locked but they are to be sealed with poly sheeting and tape as needed.
- C. A log book shall be maintained. Anyone who enters the work area must record name, affiliation, time in, and time out for each entry.

1.9 EMERGENCY PLANNING

- A. The Contractor shall develop an Emergency Plan to include fire, explosion, toxic atmospheres, electrical hazards, confined spaces, heat related injury, slips, trips and falls.
 - 1. Employees should understand the location of emergency exits and emergency procedures.
 - 2. Telephone numbers of all emergency response personnel shall be prominently posted by the Contractor.

1.10 SUPERVISION

A. The asbestos and/or lead abatement contractor shall not conduct any work (including set-up, tear down, abatement, lead-in-construction, and controlled demolition) unless the Industrial Hygienist is on site to monitor the work.

1.11 RE-ESTABLISHMENT OF THE WORK AREA AND SYSTEMS

- A. Re-secure mounted objects removed during the preparation stage.
- B. Replace objects that were removed to temporary locations.
- C. Re-establish HVAC, mechanical and electrical systems to original working condition.
- D. The area shall be restored to its original or better condition by the Contractor. The Contractor shall repair all areas, damaged as a result of the abatement activities, at no cost to BCPS. Surfaces damaged by abatement activities (such as paint removed by duct tape removal, drywall or plaster surfaces damaged by tape removal, tape or spray-glue residue left on structural surfaces, or other surface disturbances) shall be cleaned and restored to their original or better condition (as approved by the BCPS Project Manager).

2.0 ASBESTOS ABATEMENT

- 2.1 ASBESTOS ABATEMENT SCOPE OF WORK
 - A. The Contractor is required to complete all asbestos abatement described in the Asbestos Abatement Table and Asbestos Abatement Notes. The abatement scope of work listed in the Asbestos Abatement Table and Asbestos Abatement Notes is inclusive of all Base Bid and Add-

Alternate work. The Bidder is responsible for determining the abatement scope of work associated with each phase of work: the Base Bid and each Add Alternate. The Bidder is advised that, within each room or area where work is accepted, the Award Bidder shall abate all exposed and accessible friable ACMs, and all ACMs made accessible during the course of renovations. Friable ACMs (including all pipe and pipe-fitting insulation, friable thermal system insulation, spray-on fireproofing, textured/acoustical plaster, ceiling/wall tiles, ACM debris, etc.) must be removed from all work areas. Replacement ceilings, walls, chase walls, cabinetry, finishings and materials shall not be put back covering these ACMs. The Contractor is not responsible for abating these ACMs where they remain concealed within building structural elements, and remain inaccessible during the entire period of renovation: unless abatement is necessary to complete the renovation or to create safe working conditions. The asbestos abatement scope of work includes ACMs or asbestos-contamination, which will be directly disturbed due to renovation activities, and which must be abated in order to create or maintain safe working conditions. The Contractor is responsible for all associated costs.

- B. The Asbestos Abatement Table and Asbestos Abatement Notes represent an estimate of all ACMs requiring abatement. The asbestos survey report, Asbestos Abatement Table, Asbestos Abatement Notes, Specifications and Drawings shall be used as guides to assist the Bidder in determining the asbestos abatement scope of work. The Contractor shall examine these documents and make their own investigations and assessments of the site. If the Bidder identifies the need to complete abatement (additional to that described in the Asbestos Abatement Table and Asbestos Abatement Notes), the Bidder shall make inquiry during Bidding, or shall adjust their Bid accordingly.
- C. The contractor is responsible for abatement quantities equal to the sum of all quantities described in the Asbestos Abatement Table and Asbestos Abatement Notes. The distribution of ACM quantities may vary from the distribution, as described in the tables and notes and shown on drawings. The specifications and drawings may not describe and/or illustrate every detail of work required to complete the renovation scope of work. Every area/space and material disturbance along the path of renovation may not be described. The Bidder is responsible for reviewing the asbestos survey report; understanding the distribution of ACMs throughout the school; comparing the renovation scope of work to the HazMat documentation; and determining the location of all ACMs that must be abated to complete the renovation. The Contractor shall anticipate ACM abatement in hidden or concealed structural elements of the building(s) based on the ACM quantities and locations described in the HazMat documents.
- D. Any activity, such as dismantling, intact removal, demolition, cutting, sawing, drilling, abrading, attachments or penetrations to pipes, ducts, boilers, tanks, mechanical equipment, doors, windows, frames, walls, ceilings, floors, or other surfaces covered or treated with ACM(s) shall be considered an ACM disturbance. Disturbance of ACM and asbestos contamination shall be performed by a licensed asbestos abatement company in complete compliance with the Specifications For Hazardous Materials Abatement.
- E. Presumed ACMs and assumed ACM locations are listed within the HazMat sections of the Specifications. The Contractor is responsible for all costs associated with investigation, sampling, analyses, and abatement of Assumed/Presumed ACMs. If the Contractor intends to test Presumed ACMs for the purpose of finding them to be non-ACM, they must first obtain the approval of BCPS' Environmental Services staff. Environmental Services must approve the Industrial Hygienist to be used, the number and location of samples to be collected, and the analytical methods to be used. BCPS' Environmental Services staff must be consulted in advance of testing; they must be given a copy of the laboratory report and all supporting

documentation; and, they will approve or disapprove any non-ACM findings. BCPS retains the right to disallow any change in "Presumed ACM" status (regardless of sampling and analytical results). BCPS also retains the right to conduct independent investigation and testing.

F. Suspect asbestos-containing materials found to contain trace amounts (≤1%) asbestos must be treated as ACM in the same manner as materials found to contain greater than 1% asbestos.

2.2 MATERIALS AND EQUIPMENT

- A. A sufficient supply of HEPA filtered vacuum systems, negative pressure ventilation units, firerated polyethylene sheeting, protective clothing, safety equipment (hard hats, safety shoes, gloves, goggles, etc.) and all supplies and equipment necessary to complete the project must be available.
- B. Polyethylene sheeting used for all asbestos abatement and related activities must be fire-rated and shall comply with NFPA 701 as required by NFPA 101 "Life Safety Code" 1997 Edition, Sections 11-7.3.1 and 6-6.1.
- C. Respirators shall be provided in accordance with the submitted written respiratory protection plan. Minimum protection shall be full face negative pressure respirators equipped with HEPA cartridges.

2.3 PREPARATION

A. WORK AREA

- 1. Shut down and lock out power to all heating, ventilating and air conditioning (HVAC) system components that are in, supply or pass through the work area.
- 2. All unnecessary electric power in the work area should be shut off and locked out at the circuit panel box. Provide temporary power sources and lighting as required to carry out the work. Ground fault circuit interrupters shall be installed with all electrical equipment to be used in the work area. Use only grounded extension cords in single lengths or with water proof connectors to connect separate lengths if single lengths do not reach the work area.

B. PRE-CLEANING

- 1. All movable objects within the work area shall be pre-cleaned using HEPA filtered vacuums and wet wiped. After pre-cleaning, movable objects are then removed from the Work Area.
- 2. All fixed objects within the Work Area shall be pre-cleaned using HEPA filtered vacuums and wet wiped. After pre-cleaning, enclose fixed objects in two (2) layers of 6-mil polyethylene sheeting and seal securely in place.
- 3. All floors and other horizontal surfaces within the Work Area shall be pre-cleaned using HEPA filtered vacuums and wet wiped.

C. CRITICAL BARRIERS

1. Completely separate the work area from other portions of the building and the outside, by closing all openings with 6-mil polyethylene sheeting or by sealing cracks leading out of the

work area with duct tape, caulk, foam, etc. This includes all ventilation openings (supply and exhaust), light fixtures, clocks, doorways, windows, convectors, drains, skylights, speakers, lockers, and any other openings into the Work Area.

- 2. Poly containment walls that are exposed to public areas shall be covered with one layer of one-half inch (minimum thickness) plywood. Any containment entrance, bag-out entrance, or other containment breech must be fully contained within plywood structure. Temporary plywood walls with a plywood door must be constructed beyond the entrance in such a fashion that air samples can be collected between the poly containment and plywood structure. Poly walls without penetrations can be attached directly to the inside of the plywood containment.
- 3. Seal any seams in the HVAC system components that pass through the Work Area.
- 4. The Contractor shall seal edges of partitions at floor, ceiling, walls and fixtures to form air tight seals.
- 5. If necessary, mechanically support polyethylene sheeting independently of the duct tape and adhesive cement seals so that seals do not support the weight of the plastic.

D. FLOOR COVERING

- 1. Unless flooring ACM is specified for removal, cover floors in the Work Area with two (2) layers of 6-mil polyethylene sheeting.
- 2. Ensure that all holes in the floor are solidly sealed before the polyethylene sheeting is installed.
- 3. Size polyethylene sheeting to minimize seams. Stagger seams and separate them by a distance of at least six (6) feet.
- 4. Floor sheeting shall extend up the wall by at least twelve (12) inches beyond the wall/floor joint to provide a better seal against water damage and for negative pressure.
- 5. Locations where floor tile is to be removed will not be covered in polyethylene sheeting.

E. WALL COVERING

- 1. Unless ACM on the walls is specified for removal, cover walls in the work area with one (1) layer of 6-mil polyethylene sheeting.
- 2. Wall sheeting shall be sized to minimize seams. Stagger seams and separate them by a distance of at least six (6) feet.

F. CEILING COVERING

- 1. Unless ceiling ACM is specified for removal, all ceilings which are constructed of, or covered with porous or non-cleanable material shall be protected by the installation of one (1) layer of 6-mil polyethylene sheeting.
- 2. If necessary, mechanically support the polyethylene sheeting independently of duct tape or
adhesive seals so that seals do not support the weight of the plastic.

G. WORKER DECONTAMINATION FACILITY

- A worker decontamination facility shall be provided at all locations where workers will enter or exit the Work Area. One system at a single location for each contained Work Area is preferred.
- 2. The worker decontamination facility shall consist of at least a clean room, shower room and equipment room, each separated from the other rooms by an air lock.
- 3. The worker decontamination facility shall utilize 6-mil opaque black or white polyethylene sheeting or other acceptable materials for privacy.
- 4. Shower room shall contain one or more showers as necessary to adequately accommodate workers. Each shower head shall be supplied with hot and cold water adjustable at the tap. The shower enclosure shall be constructed to prevent leakage of any kind. An adequate supply of soap, shampoo and towels shall be supplied by the Contractor and available at all times. Shower water shall be drained, collected and filtered through a system with at least 0.5-1 micron particle size collection capacity.
- 5. Two layers of 6-mil polyethylene sheeting shall be used for all floors, walls and ceilings of the decontamination facility.

H. WASTE AND EQUIPMENT DECONTAMINATION/PASS-OUT SYSTEM

- 1. The Contractor shall construct a waste and equipment decontamination/pass-out system at a location away from the worker decontamination facility. Wherever, possible, the waste and equipment decontamination/pass-out system shall be located where there is direct access from the Work Area and to the outside of the building.
- 2. The Contractor shall construct the waste and equipment decontamination/pass-out system in a similar fashion to the worker decontamination facility using similar materials, and airlock design.
- 3. The waste and equipment decontamination/pass-out system shall not be used to enter or exit the Work Area.

I. INSTALLATION AND OPERATION OF NEGATIVE PRESSURE VENTILATION EQUIPMENT

- Install and initiate operation of negative pressure ventilation equipment. Openings made in the enclosure system to accommodate these units shall be made airtight with tape and/or caulking as needed. If more than one (1) unit is installed, they should be turned on one at a time, checking the integrity of barriers for secure attachment and the need for additional reinforcement.
- The Contractor shall investigate and make sure that the electrical power existing at the work site is adequate to meet the electrical power demand by the negative pressure ventilation units. If power is inadequate, the Contractor will be responsible for supplying temporary power sources.

- 3. Supply the number of negative pressure ventilation units necessary to provide one air change every fifteen (15) minutes in all locations of the work area. Maintain a negative pressure equal to, or greater than negative 0.02 inches of water gauge.
- 4. Negative pressure ventilation units shall be exhausted to outside of the building whenever feasible. They shall not be exhausted into occupied areas of the building. Twelve (12) inch wire-reinforced extension ducting shall be used to reach from the work area to the outside. Exhaust ducting that is routed through an exterior window or door must be secured by a minimum of one layer of one-half inch thick plywood. Plywood must fill the entire window or door opening, with a circle cut out that is only large enough to accommodate the exhaust ducting.

J. MAINTENANCE OF WORK AREA CONTAINMENT

- 1. All polyethylene barriers inside the Work Area, in the worker decontamination facility and at partitions constructed to isolate the Work Area from occupied areas shall be inspected at least twice daily, prior to the start of each day's abatement activities and following the completion of the day's abatement activities.
- 2. Damage to and/or defects in the containment system are to be repaired immediately upon discovery.
- 3. At any time during the abatement activities after barriers have been erected, if visible material is observed outside of the work area or if damage occurs to barriers, all debris/residue must be cleaned up using appropriate HEPA vacuuming and wet mopping procedures.
- 4. If air samples collected outside of the Work Area during abatement activities indicate airborne fiber concentrations greater than 0.005 f/cc or pre-measured background level (whichever is lower), work shall immediately cease for inspection of barriers. Clean-up of surfaces outside of the work area using HEPA vacuums and wet cleaning techniques may be necessary. Follow up air sampling, outside the work area, shall then be conducted to document reduced airborne fiber concentrations.

K. COMMENCEMENT OF WORK SHALL NOT OCCUR UNTIL:

- 1. Work Area containment has been constructed and tested.
- 2. All pre-abatement submissions, notifications, postings and permits have been provided and are satisfactory to the BCPS Project Manager.
- 3. All negative pressure ventilation systems are functioning adequately as specified.
- 4. All equipment for abatement, clean-up and disposal are on hand.
- 5. All worker training and certification is completed.
- Contractor receives permission from the Industrial Hygienist to commence abatement. Permission to proceed is required on each full-containment, mini-containment, glove bag, or other containment type. Permission to proceed is required on each glove bag, after appropriate inspection and/or smoke testing of the glove-bag set up.

2.4 REMOVAL PROCEDURES

- A. When possible, begin removal at point farthest from the negative air ventilation unit(s) and work toward the unit(s).
- B. Wet all asbestos containing material with amended water solution using equipment capable of providing a fine spray mist in order to reduce airborne fiber levels when the material is disturbed. Perforate outer covering of any insulation which has been painted and/or jacketed in order to allow penetration of amended water. Saturate the material to the substrate, however, do not allow excessive water to accumulate in the work area.
- C. Spray material repeatedly during the work process to maintain a continuously wet condition. Keep all removed material wet enough to prevent fiber release until it can be containerized for disposal.
- D. Wetting procedures are not equally effective on all types of asbestos containing materials, but, shall be used in all cases, including floor tile and mastic removal.
- E. Saturated asbestos containing material shall be removed in manageable sections. Removed material should be containerized before moving to a new location for continuance of work. Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible material is cleaned up.
- F. Material removed from building structures or components shall not be dropped or thrown to the floor. Material should be removed as intact sections or components whenever possible and carefully lowered to the floor.
- G. After completion of all stripping, work surfaces from which asbestos containing materials have been removed shall be wetted, brushed and sponged or cleaned by some equivalent method to remove all visible residue.
- H. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and negative ventilation units are in operation again.

2.5 CLEAN-UP PROCEDURES

- A. Remove and containerize all visible accumulation of asbestos containing material and asbestos contaminated debris utilizing rubber dust pans and rubber squeegees to move material around. Do not use metal shovels to pick up or move accumulated waste. Special care must be taken to prevent damage to floor sheeting.
- B. Remove all containerized waste from the work area and transport from the work area to the disposal site or temporary storage facility. Temporary storage of asbestos waste within the school is prohibited.
- C. Wet clean all surfaces in the work area using rags, mops, sponges and HEPA vacuum systems as appropriate.
- D. Decontaminate all tools and equipment and remove at the appropriate time in the cleaning sequence.

- E. The Work Area shall be cleaned until it is in compliance with Federal, State and Local requirements and/or any more stringent criteria specified herein. Any additional cleaning cycles shall be provided as necessary, at no cost to the owner until these criteria have been met.
- F. The negative air filtration devices must be kept operational during entire clean-up and decontamination procedure.
- G. When clean-up is completed, the Work Area shall be allowed to dry.

2.6 VISUAL INSPECTION

- A. The Industrial Hygienist shall make the final inspection of the Work Area for visual residue. If any residue is observed, it will be assumed to be asbestos and the cleaning cycle must be repeated.
- B. All surfaces, including polyethylene sheeting, must successfully pass the visual inspection.
- C. The Work Area must be entirely dry with no visible wetness.
- 2.7 ENCAPSULATION OF WORK SURFACES (LOCK DOWN)
 - A. After successfully passing the visual inspection, the Contractor shall apply a coating of bridging encapsulant to all surfaces in the Work Area from which asbestos has been removed and any cut or exposed surfaces of asbestos-containing materials or fiberglass insulation. Spray-encapsulant shall be applied to all polyethylene sheeting used to cover walls, floors, ceilings and nonremovable fixtures. Surfaces from which floor tile and mastic have been removed shall not be sprayed with encapsulant.
 - B. A heavy coat of encapsulant shall be applied to the soil in areas where contaminated soil was removed or areas where asbestos debris was removed from the soil. A heavy coat of spray encapsulant shall be applied to all areas of the soil that were abated. Two layers of 6 mil poly will be applied to the surface of the soil with edges of plastic glued and duct-taped to side walls. Poly layers must be removed at the completion of the General Contractor's renovation project. The poly must be removed by the asbestos abatement Contractor by licensed abatement workers.
 - C. Allow encapsulant to dry.
- 2.8 FINAL CLEARANCE OF WORK AREA
 - A. Continue to operate negative air filtration system.
 - B. Carefully roll up the polyethylene sheeting used to protect floors, walls, ceilings and nonremovable fixtures with the contaminated portion on the inside and package for disposal as asbestos contaminated waste. Any other debris shall also be disposed of as asbestos contaminated waste.
 - C. Plastic used to maintain critical barriers at doors windows, vents, etc., shall be sprayed with encapsulant, but not removed until air monitoring is successfully completed.
 - D. Wet clean with amended water all walls, floors, woodwork, ceilings, fixtures and all other surfaces. Allow surfaces to dry. All cloths and sponges used in the cleaning operation must be disposed of as contaminated waste.

- E. Following the cleaning operation, the Industrial Hygienist will perform a visual inspection of the removal area. Areas failing the final inspection shall be re-cleaned. Any additional cleaning cycles required to pass the final inspection will be provided by the Contractor at no cost to BCPS.
- F. After the successful completion of the visual inspection, the Industrial Hygienist will conduct clearance air monitoring.
- G. All samples shall be analyzed by phase contrast microscopy (PCM) using NIOSH 7400 method and/or transmission electron microscopy (TEM) in accordance with 40 CFR 763, Appendix A to Subpart E.
- H. The sample collection will be made while using the aggressive procedures described in USEPA 1985, "Measuring Airborne Asbestos following an Abatement Action", and 40 CFR 763 Appendix A to Subpart E.
- I. PCM samples will be analyzed on site. TEM results will be available within twenty-four (24) hours of sample collection. Quicker TEM result turnaround time may be required depending on the given project.
- J. The clearance criteria for release of work area will be as stated in 40 CFR 763.90 (I) of Subpart E, subject to 2.8 M (listed below).
- K. Areas failing final clearance shall be re-cleaned using procedures described in Section 2.5, and retested until satisfactory results are obtained. Any additional cleaning cycles will be at no cost to BCPS. If final clearance samples exceed acceptable limits, any additional testing that is necessary will be performed at the Contractor's cost. All additional cleaning and associated hygienist services will be paid for by the Contractor.
- L. For abatement projects requiring TEM clearance, if the air monitoring fails to meet acceptable clearance criteria, subsequent testing will be paid for by the Contractor. Additional testing will have a twenty-four (24) hour turnaround time for results.
- M. All TEM clearance samples must be below 70 s/mm2 and all PCM clearance samples must be less than 0.01 fibers/cc. Averaging of samples is not permitted for demonstrating final clearance.
- N. The Contractor must accommodate final air sampling of the Industrial Hygienist. Therefore, the Contractor must include in their bid all necessary abatement time extensions or additional abatement work days necessary to complete final air testing in accordance with 40 CFR 763, COMAR protocol, and the requirements of BCPS as further described below. The Contractor is responsible for any additional abatement costs and abatement monitoring costs associated with subsequent rounds of final air samples if the first round or subsequent rounds of final air samples do not pass all final air clearance criteria. The following guidelines shall determine whether PCM or TEM final air sampling protocols are employed for each set of final air clearance samples.
 - Determination of a NESHAP size Project is based on the quantity of regulated ACM removed from the school since January 1st of that calendar year. Once the cumulative amount of ACM removed from a school during the calendar year exceeds NESHAP quantity, TEM air sampling shall be conducted for all abatement of regulated ACM, regardless of the quantity of ACM abatement (For example, if asbestos insulation is removed from one pipe fitting with one glove bag, TEM final air clearance must be conducted.)

- 2. Final air sampling is required for all ACM abatement inside or outside the school building and regardless whether the material is RACM, Category I Non-Friable, or Category II Non-Friable.
- 3. Air sampling shall be conducted during removal or disturbance of roofing materials if the methods used render any portion of the ACMs or PACMs friable. If rendered friable, air sampling shall be conducted on the roof (in and around the work area); air sampling shall also be conducted inside the school below the work area. If hand/manual cutting methods are used which do not render the ACM/PACM friable (for example, use of axes, hatchets, knives, spud bars, shovels, power slicers, power plows, but not saws), air sampling is not required; however, an Industrial Hygienist must still be present during all work.
- 4. Asbestos caulking and glazing compounds which are friable, or will become friable, during abatement procedures must be treated as friable ACMs. TEM final air sampling is required for all such friable abatement.
- 5. Cut-and-wrap methods must be treated similarly to glove bag methods. This is considered a friable removal. TEM final air sampling is required if the school is over NESHAP for the calendar year.
- O. If multiple rooms, areas, spaces, hallways, etc. are clearance air sampled utilizing one set of air samples, each such room, area, space, hallway, etc. must be represented by at-least one air sample collected within that discrete space. For example, seven classrooms and a hallway contained within one containment cannot be cleared with one set of five inside-containment air samples. At-least eight inside-containment air samples would be required to clear this containment.

2.9 RE-ESTABLISHMENT OF THE WORK AREA AND SYSTEMS

- A. Re-establishment of the Work Area shall only occur following the successful completion of clearance air monitoring.
- B. Remove the remaining critical polyethylene barriers and dispose as contaminated waste.

2.10 DISPOSAL OF ASBESTOS

- A. All waste materials, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, State, and Federal regulations and herein.
- B. Immediately collect asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing which may produce airborne concentrations of asbestos fibers and place in sealed fiber-proof, waterproof, non-returnable containers (e.g. double plastic bags 6-mils thick, cartons, drums or cans). Wastes within the containers must be adequately wet in accordance with 40 CFR 61-SUBPART M. Properly decontaminate the waste containers before they leave the containment area. Affix warning and Department of Transportation (DOT) label to each container including the bags, or use at least 6-mils thick bags with the approved warnings and DOT labeling preprinted on the bag.
- C. The name of the waste generator, the location at which the waste was generated, the Contractor's Asbestos License number, and the date the container was sealed shall be clearly

indicated on the outside of each container. Prevent contamination of the transport vehicle (especially if the transport vehicle is a rented truck likely to be used in the future for non-asbestos purposes). These precautions include lining the vehicle cargo area with 6-mil plastic sheeting (similar to work area enclosure) and thorough cleaning of the cargo area after transport and unloading of asbestos debris is complete. Dispose of waste asbestos material at an EPA or State-approved asbestos landfill.

D. For temporary storage of less than 20 cubic yards of ACM, store sealed impermeable bags in rigid asbestos waste containers for no more than 7 days after completion of the abatement project. An area for interim storage of asbestos waste-containing drums or skids will be assigned by BCPS. Procedure for hauling and disposal shall comply with 40 CFR 61-SUBPART M, Section 61.150, State, regional, and local standards. Sealed plastic bags may be dumped from drums into the burial site unless the bags have been broken or damaged. Damaged bags shall remain in the drum and the entire contaminated drum shall be buried. Workers unloading the sealed drums shall wear appropriate NIOSH approved respiratory protection and personal protective equipment when handling asbestos materials at the disposal site.

2.11 ALTERNATIVE PROCEDURES

A. GENERAL

- 1. Procedures described in this specification must be utilized at all times.
- 2. If specified procedures cannot be utilized, a request must be made to the BCPS Project Manager, providing details of the problem encountered and recommended alternatives.
- 3. Alternative procedures must provide equivalent or greater protection than the procedures they replace.
- 4. Any alternative procedures must be approved by the BCPS Project Manager and/or BCPS' Environmental Services staff.
- If glovebag or mini-enclosure procedures are to be utilized, they must, at a minimum, adhere to the procedures contained in the attachments "Glovebag Techniques for Small Scale Activities" and "Mini-enclosure for Small Scale Activities".
- 6. For floor tile removal, all procedures contained in this specification apply.
- 7. The Contractor is responsible for obtaining any variance that is required to utilize an alternative procedure.

B. GLOVEBAG TECHNIQUE FOR SMALL SCALE ACTIVITIES

- All glovebag operations must be conducted within a contained area with negative pressure. Rooms or open areas, within which glove-bag asbestos removal will take place, must be isolated from the rest of the building by physical or poly barriers. Critical barriers, walls and floors are not required to be covered and sealed in accordance with full-containment criteria. Negative air filtration must be provided within the contained area, but need not meet full containment requirements for four air changes per hour.
- 2. Contained areas set-up with large numbers of glove bags (such as crawlspaces, hallways,

mechanical areas, etc.) must be furnished with a decontamination chamber. If a three-stage decontamination chamber is utilized, workers may wear a single layer of protective clothing. If a two-stage, single-stage, or no decontamination chamber is utilized, workers must wear two layers of protective clothing.

- 3. Cover all surfaces directly under the glovebag and extending to a minimum distance of five (5) feet from the glovebag in all directions, with a single layer of 6-mil polyethylene sheeting.
- 4. Place all necessary tools into the pockets located inside the glovebag. Also include a quantity of bridging encapsulant.
- 5. Pre-clean the insulated surface to ensure adhesion between the insulation and tape seal.
- 6. Place one strip of duct tape along each edge of the open top slit of the glove bag for reinforcement. The bottom seam of the bag is also taped to ensure its integrity.
- 7. Attach the bag to the insulated surface by folding and lapping the open edges and sealing with staples and duct tape to form a tight seal.
- 8. If needed, provide additional support to the glovebag to prevent the weight of the removed material from damaging the glovebag or the pipe and its supports.
- 9. Use a smoke tube with aspirator bulb to test seal. Place tube into a marked entry port and fill the bag with visible smoke by squeezing the bulb. The smoke tube shall be removed and the entry port taped closed. Gently squeeze the glovebag and look for smoke leaking out, especially at the top and ends of the glovebag. If leaks are found, tape closed using duct tape and re-test.
- 10. Once smoke test has been passed, the entry port is opened, and the bag is squeezed lightly to remove excess smoke.
- 11. Cut open the side port, insert the wetting agent sprayer nozzle and thoroughly wet the area to be removed. The nozzle is removed and the HEPA vacuum hose is inserted into the port and sealed tightly with duct tape.
- 12. Proceed with removal by having the worker insert his arms through the armholes and into the gloves.
- 13. When necessary, apply more wetting agent into the bag during removal to ensure the material is kept wet at all times.
- 14. When removal is completed, reinsert the sprayer nozzle and thoroughly wet and clean the abated surfaces, all non-disposable tools and the top portion of the bag to below the side port.
- 15. The rough edges of the cut ACM are then coated/sealed with bridging encapsulant.
- 16. Keep the tools that will be reused in the top section of the bag. Activate the vacuum to remove air from the glovebag. While air is being removed, squeeze the bag as tightly as possible, just below the side port.

- 17. After the air has been removed, twist the glovebag and tape and seal at the twisted area, with all removed and contaminated material at the bottom of the bag.
- 18. Place the bag in a 6-mil disposal bag.
- 19. If cuts, holes or ruptures occur in the glovebag, stop all work immediately, repair the damage, and clean the work site as needed.
- 20. The Contractor is responsible for obtaining any variance required by MDE to utilize a glovebag procedure.

C. MINI-ENCLOSURE FOR SMALL SCALE ACTIVITIES

- 1. The structure will consist of 6-mil polyethylene sheeting supported by a preconstructed framework formed around the Work Area.
- 2. Two layers of 6-mil polyethylene sheeting will be used for all floors, walls and ceilings of the mini-enclosure. The floor inside the mini-enclosure will extend no less than one (1) foot up each wall.
- 3. The structure will be minimized in size so as to allow entry to only the number of workers necessary to perform the activity.
- 4. A small changing room (approximately three (3) feet by seven (7) feet) will be constructed contiguous to the mini-enclosure. Entry to the changing room and from the changing room to the mini-enclosure will be through double sheeted entry ways. The first layer of sheeting in the entry way will be sealed to the doorway at the top and on the right side, the second sheet will be sealed at the top and on the left side.
- 5. All workers will use a double set of protective coveralls.
- 6. After completing the activity, the worker will HEPA vacuum his outer layer of disposable coveralls, remove them and leave them in the mini-enclosure as asbestos contaminated waste. He will then enter the changing room and remove the inner layer of disposable coveralls and wet wipe his respirator, leaving it on until exiting the changing room.
- 7. The Contractor is responsible for obtaining any required variance necessary to utilize a minienclosure procedure.

D. REMOVAL PROCEDURES FOR ASBESTOS FLOOR TILES AND MASTIC

- 1. If either material (the floor tile or the associated mastic) contains asbestos, both materials shall be removed as ACM. Asbestos floor tile is assumed to contaminate non-asbestos mastic, and asbestos mastic is assumed to contaminate non-asbestos floor tile.
- 2. The following procedures shall be used only when the removal procedure will not cause the material to become "Regulated" as defined in 40 CFR Part 61.141, or "Friable" as defined in COMAR 26.11.21. For example, asbestos floor tiles must be removed in whole. Use of buffers or other mechanical methods will cause the mastic removal to be regulated.
- 3. Completely separate the Work Area from other portions of the building and the outside by

closing all openings with 6-mil polyethylene sheeting or by sealing cracks leading out of the work area with duct tape, caulk, foam, etc. This includes all ventilation openings (supply and exhaust), doorways, windows, convectors, drains, skylights and any openings into the Work Area.

- 4. Seal any seams in the HVAC system components that pass through the Work Area.
- 5. Cover all walls to a height of six feet with one layer of 6-mil polyethylene sheeting.
- 6. Cover all non-removable objects that are within six feet of the area of removal.
- 7. Use wet, methods at all times during the removal.
- 8. Use negative pressure ventilation equipment at all times to maintain a minimum negative pressure of negative 0.02 inches of water gauge. The negative pressure must be maintained until final air samples have passed the clearance criteria.
- 9. The clearance criteria for release of the Work Area will be as stated in 40 CFR 763.90 (I) of Subpart E. Aggressive sampling will be used for clearance sampling.
- 10. Except as noted above, all provisions contained in the "Specifications for Hazardous Materials Abatement" will be followed.
- E. ASBESTOS CONTAINING WINDOW REMOVAL ACTIVITIES
 - The abatement company will establish a written abatement design for the specific conditions presented by each window abatement job. The abatement Contractor is responsible for the removal and disposal of all windows in accordance with all Federal, State, and local regulations as well as these specifications. Interior ACM applications must be abated in accordance with AHERA protocols and these specifications.
 - Window system removal or disturbance must be conducted as an asbestos abatement project. Abatement methods employed must meet the approval of MDE and EPA requirements. In addition to regulatory requirements, the requirements of these specifications and those listed below must be followed:
 - a. A poly critical (consistent of two layers of 6-mil poly) must be established on the inside of the window system. The critical must cover the entire window system with an air-tight seal.
 - b. The room(s) (where the abatement is taking place) shall be sealed from the corridor or other areas of the school: to prevent the spread of contamination from the immediate room in the event of a release from the abatement work area. The doors to the room shall be sealed in an air-tight fashion, or shall be fitted with flapped and layered ploy.
 - c. Cover all vents and HVAC equipment in the room.
 - d. ACM glazing applications must be sealed/covered with duct tape to minimize disturbance during removal.
 - e. All glass that will remain in the frame during abatement must be taped to minimize the

breakage hazard.

- f. If work must be performed inside the building, which will disturb ACM, a containment enclosure must be erected inside sufficient in size for the individual(s) to safely work.
- g. Visual and physical barriers must be maintained surrounding the work area at all times; both inside and outside the building. Workers in protective suites and respirators cannot be visible to the public at any time. Clear or milky poly is not an acceptable visual barrier. If poly is used as a visual barrier, the poly must be black or opaque. At minimum, physical barriers to the work area shall consist of plastic safety fencing marked with safety tape. If the regulated area will be unattended or unsupervised at any time prior to final air clearance and tear-down, a rigid physical barrier must be erected on the exterior of the building. Minimum requirements for rigid physical barriers include steel fencing or ½-inch plywood to a height of 6 feet surrounding the exterior portions of the regulated area.
- h. Drop clothes must be used. Install a 6 mil poly drop cloth outside the window. The drop cloth must extend beyond the ends of the window wall and far enough from the building so as to catch all debris generated.
- i. HEPA Vacuuming and wet abatement methods must be employed. Maintain wet conditions during the entire process. Hand scrape caulk and/or glazing after wetting with amended water. If power tools are used to remove glazing or putty, in addition to wetting, a HEPA Vacuum must be used at the point of removal to collect all dust generated. HEPA Vacuum all dust and debris as it is generated.
- j. When the window wall is removed, place it on a drop cloth and immediately wrap in 6 mil poly. Place the wrapped window wall in a lined dumpster and dispose as contaminated waste.
- k. All debris and surfaces shall be thoroughly cleaned and disposed as asbestos waste. Thoroughly clean all residue from the window opening of the building. Thoroughly clean all drop cloths and dispose as contaminated waste. Thoroughly clean the first critical barrier, remove and dispose as contaminated waste.
- At least two PCM air samples must be collected inside the school (outside the contained Work Area) during all phases of the abatement project. PCM air sampling shall demonstrate that no asbestos release occurred to the school during the abatement actions. If not, remediation of the school will be completed by the Contractor and will meet BCPS remediation requirements.
- m. In addition to abatement clearance requirements for the window "containments", a set of PCM clearance air samples shall be completed within the school building (outside the contained Work Area).
- F. MANUAL REMOVAL OF ASBESTOS CONTAINING ROOFING MATERIAL: Baltimore County Public Schools recognizes that non-friable asbestos containing roofing material may be removed by certain manual methods such that the material is not made friable, and can be treated as nonregulated material. Although each project may be slightly different, the following procedures must be used as a minimum in order to conduct a removal using "Manual Methods". The contractor must obtain approval from BCPS for the tools and procedures to be used on the project prior to

work beginning. It is also the contractor's responsibility to ensure that the methods and tools used are in compliance with all regulatory agencies (EPA, MOSH, MDE, Baltimore County DEPRM, etc.)

- 1. Power tools, except as noted, may not be used. The roof material may be sliced manually (e.g., with an axe or knife) and removed by hand. The material must not be torn, only sliced with a blade. BCPS also considers a "Roof Warrior" with the vertical blade attachment that slices the roof material a manual method of removal. These methods will maintain the material in a non-friable condition. After cutting, the material must then be lowered into a lined refuse container for proper disposal. The cut material may not be thrown from the roof. Chutes may not be used unless they comply with OSHA's "Dust Tight" requirement. The use of water may be required to reduce the risk of generating dust. Chutes may be used for non-asbestos materials, but non-asbestos materials may not be dropped on the asbestos containing materials.
- 2. Refuse containers must be lined.
- 3. Refuse containers must be attended at all times. The containers must either be removed at the end of each work day, or secured and covered if they are to be left on site. Secured and covered means that no unauthorized persons can access the interior of the container, and it is covered to prevent rain from entering. Suitable methods of securing would be a lockable fence of suitable height, or a container with lockable doors. Plastic sheeting or waterproof tarpaulins would be an acceptable rain covering.
- 4. During the entire asbestos removal operation, an independent industrial hygienist, contracted to the Board, will oversee the work practices and perform sampling for airborne asbestos. If at any time, the airborne asbestos level down wind of the work reaches 0.01 f/cc or greater, the removal must be stopped and an asbestos abatement contractor must be utilized to complete the remaining removal using appropriate asbestos abatement procedures at no additional cost to BCPS.
- 5. Seal off all entrances and penetrations to the roof (critical barriers) within the designated asbestos Work Area. All exhaust vents, windows, doors, chimneys, and other openings shall be sealed with one layer of 6-mil. poly.
- 6. Within ten (10) business days of completing a roof replacement project, the Award Bidder will address a letter to Baltimore County Public Schools stating that no replacement or restoration materials used on this Project contain asbestos or asbestiform minerals. The letter shall be sent to the attention of Mr. Bob Merrey at Baltimore County Public schools, Department of Physical Facilities, Office of Environmental, 9610 Pulaski Park Drive, Suite 204, Baltimore Maryland 21220.
- G. ROOF PENETRATION WITH ASBESTOS CONTAINING ROOFING MATERIALS REMOVAL: In addition to regulatory requirements, the requirements of these specifications and those listed below must be followed:
 - 1. Establish designated limits for the asbestos Work Area with the use of warning tape or other continuous barriers, and maintain all other requirements for asbestos control areas except local exhaust.
 - 2. A poly critical (consistent of two layers of 6-mil poly) must be established on the inside of the

roof deck. The critical must form an air-tight separation between the roof penetration and the interior of the building.

- 3. Seal off all entrances to the roof (critical barriers) within the designated asbestos Work Area. All exhaust vents, windows, doors, chimneys, and other openings shall be sealed with one layer of 6-mil. poly.
- 4. HEPA Vacuuming and wet abatement methods must be employed. Maintain wet conditions during the entire process. If power tools are used, in addition to wetting, a HEPA Vacuum must be used at the point of removal to collect all dust generated. HEPA Vacuum all dust and debris as it is generated.
- 5. Remove the material intact, any non-intact debris should be HEPA vacuumed. Wrap and wet all non-intact material while on the roof.
- 6. Wet ACM material with fine mist spray of surfactant or a removal encapsulant during removal or other handling so as to reduce the emission of airborne fibers. Remove roofing material, coating, or wall panel by hand without cutting to the greatest extent possible and immediately transport to a dumpster at ground level. Wet materials in the dumpster with a fine spray of amended water or removal encapsulant to control visible emissions.
- Hand Cutting and Removal: Use manual methods such as axes, hatchets, knives, spud bars, shovels, power slicers, power plows, but not saws. Lightly mist the area to be removed with a fine spray of surfactant or removal encapsulant. Dispose of all materials as Category I – Non-Friable Demolition Waste.
- 8. Machine Cutting and Removal: Lightly mist the area to be removed with a fine spray of surfactant or removal encapsulant. Provide HEPA exhaust equipment for machine cutters (HEPA Vacuums). Use equipment shrouds to control visible emissions. All HEPA vacuum dust shall be properly bagged and disposed of as asbestos-containing waste.
- All debris and surfaces shall be thoroughly cleaned and disposed as asbestos waste. Thoroughly clean all residue from all surfaces. Thoroughly clean all critical barriers, remove and dispose as contaminated waste.

H. ABATEMENT AND DEMOLITION OF BOILERS AND BOILER BASES

- 1. Demolition of boilers and boiler bases must take place inside a negative-pressure asbestosabatement containment until it is established that no asbestos-containing materials will be encountered. All work must be conducted by a licensed asbestos abatement contractor in accordance with all conditions of the Specifications of Hazardous Materials Abatement. All components and layers of boilers and boiler bases must be exposed for direct visual inspection to determine that no ACMs are present. All components and layers shall be dismantled and destructively investigated within the containment until all ACMs are identified and removed. If all components, layers, materials comprising boilers and boiler bases cannot be exposed, the entirety of boiler and boiler base demolition shall be completed by the abatement contractor within the negative-pressure abatement containment.
- 2. ACMs associated with the boilers and boiler bases may include, but are not limited to the following: boiler jacket insulation; hidden insulation layers or packing materials located under the surface insulation layer(s); rope gaskets between boiler sections or at equipment/pipe

connections; insulation or packing materials internal to the boiler; cementitious or plasterous structural or surfacing applications on or internal to the boiler; gasket or insulation material between the steel boiler and the masonry, brick, or block boiler base; insulation or gasket materials between horizontal or vertical layers of brick, block, masonry, or concrete; tar or asphalt applications between the boiler base and the concrete floor slab; tar, felt, caulking, or glazing materials on, between, or within any of these structural elements; and sprayed-, troweled-, or painted-on tar or other suspect ACM surfacing materials applied to any of these structural elements.

- 3. Boiler bases include all structural support materials under the steel boiler, between the steel and the concrete floor slab.
- 4. Materials and surfaces that can be decontaminated (those that are smooth, non-porous, and cleanable) may be disposed as non-ACM waste, once decontamination is complete. All other materials must be disposed as ACM waste. Bricks are not considered cleanable and must be disposed of as ACM waste.
- 5. During abatement and demolition of boilers, all penetrations from the boiler room to other building areas must be sealed in an air-tight fashion with two layers of 6-mil poly. All HVAC equipment, vents, and ducts must also be covered and sealed with two layers of 6-mil poly.
- 6. All of the procedures of these Specifications shall be followed unless alternate procedures are approved in writing by the BCPS Project Manager.
- I. REMOVAL OF MECHANICAL GASKETS
 - Mechanical gaskets are assumed to be present at flange connections of piping, ducting, and other mechanical equipment. If gaskets cannot be inspected and sampled without disturbance, the gaskets shall be treated as ACM. Rather than disconnecting pipe/duct/mechanical equipment sections and exposing the gasket, the equipment sections containing gaskets can be cut out and disposed as ACM. The contractor is responsible for all costs associated with investigation, testing, analysis, and abatement.
- J. REMOVAL OF DOORS
 - All interior and exterior doors are assumed to be asbestos containing fire doors. Removal/ modification to doors, and hardware replacement/salvage, are considered ACM abatement activities and must be conducted by the abatement contractor in full compliance with the Specifications For Hazardous Materials Abatement. The abatement contractor shall protect the school from asbestos fiber release during all such operations and clean all salvaged components of any and all asbestos residue.

2.12 ASBESTOS ABATEMENT FINAL REPORTS

A. BLANK ASBESTOS ABATEMENT INFORMATION SHEETS (following five sheets)

BALTIMORE COUNTY PUBLIC SCHOOLS ASBESTOS ABATEMENT INFORMATION SHEET

Contractor Name & Address	School Name & Address	
Contractor License #:	Contractor Job #:	
Work Order #:	(B.C.P.S. WILL SUPPLY)	
School #:	(B.C.P.S. WILL SUPPLY)	
B.C.P.S. Person Ordering Work: OFFICE FIELD		
Start Date:	Completion Date:	
Total Number of Hours:	_	

Location and Description of Abatement Site:

Location	Material	Quantity	Date Removed

TOTALS			

Reason for Choosing Response Action:

DESCRIPTION AND EXPLANATION OF ENTIRE ABATEMENT ACTIVITY AND ENGINEERING CONTROLS UTILIZED. <u>INCLUDE EXACT LOCATIONS, AMOUNTS AND TYPES OF ASBESTOS REMOVED, ENCAPSULATED OR ENCLOSED</u>. ATTACH ADDITIONAL SHEETS IF NECESSARY.

Description and	l Explanation of	f Transportation	and Disposal of Asbestos:
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Name of Dispos	al Site:					
Address of Disp	oosal Site:					
List all Personn	el Assigned to Projec	t. Include:				
	Name					
	Classification (Work	er, Supervisor, etc.)				
	Accreditation #	-				
	State of Accreditation	n				
	Date of Accreditation	1				
	Expiration of Curren	t Accreditation				
	Total # Hours Worke	ed				
	Signature Verifying	Having Worked on Project	et			
Name	Class	Accreditation #	State	Date	Expiration	Work Hours

Signature Verifying Having Worked on Project:

LIST OF EQUIPMENT:

NAME OF PROJECT MONITORING FIRM:

SPECIFICATIONS FOR HAZARDOUS MATERIALS ABATEMENT

020820-28

PROJECT DESIGNER NAME:		
PROJECT DESIGNER ACCRED. # & S	STATE:	
COMPANY AFFILIATION:		
COMPANY ADDRESS:		
-		

ENCLOSED SHOULD BE THE FOLLOWING: STATE/EPA NOTIFICATION OF ASBESTOS PROJECT SHEET; COUNTY WASTE DISPOSAL APPROVAL; LANDFILL RECEIPT; PROJECT DESIGN PAPERWORK; ANY OTHER CORRESPONDENCE OR INFORMATION PERTAINING TO THE ABATEMENT.

REMINDER: ALL AHERA, FEDERAL, STATE AND LOCAL REQUIRMENTS ARE EFFECTIVE FOR B.C.P.S. WORK.

Signature of Chief Officer or Designee

Name and Title (Typed)

Date

B. EXAMPLE COMPLETED ASBESTOS ABATEMENT INFORMATION SHEETS (following eight sheets)

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

BALTIMORE COUNTY PUBLIC SCHOOLS ASBESTOS ABATEMENT INFORMATION SHEET

Contractor Name & Address	School Name & Address				
Example Asbestos Removal, Inc.	Example Elementary School				
555 Pulaski Highway	8220 Example Road				
Baltimore, MD 21237	Example, MD 21244				
(Subcontractor of ABC GC, Inc.)					
Contractor License #: M12-34-567	Contractor Job #: 123-45				
Work Order #: <u>CP210000000 – PO for AE</u>	BC GC, Inc. (B.C.P.S. WILL SUPPLY)				
School #: 123400	(B.C.P.S. WILL SUPPLY)				
B.C.P.S. Person Ordering Work: OFFICE FIELD Project Manager	Department of Physical Fac.				
Start Date: <u>5/25/03</u>	Completion Date: 8/05/04				
Total Number of Hours: N/A					

Location and Description of Abatement Site:

Asbestos abatement of classrooms, storage rooms, cafeteria, kitchen, stage, media room, boiler room and office areas to accommodate scheduled renovation work. See the following table for locations, descriptions and quantities of abated asbestos containing materials. All floor tile and mastic was abated in the immediate vicinity of the unit vents in those rooms. Window caulking/glazing applications were abated during the demolition of the entire window system, which was treated an asbestos containing material (ACM). All pipe insulation and pipe fittings abated were located above the ceiling except for rooms 19, 21, 26 and the principles office where one fitting was identified in each of the unit vents.

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

Location	Material	Quantity	Date Removed		
	2x4 ceiling tile	900 SF	9/25-9/29/03		
Room #1	Pipe Insulation	22 LF	9/25-9/29/03		
	Pipe Fittings	4	9/25-9/29/03		
	2x4 ceiling tile	900 SF	9/25-9/29/03		
Room #3	Pipe Insulation	10 LF	9/25-9/29/03		
	Pipe Fittings	2	9/25-9/29/03		
	2x4 ceiling tile	900 SF	10/2-10/6/03		
Doom #5	Pipe Insulation	22 LF	10/2-10/6/03		
K00III #3	Gray Exterior Window Caulk	60 LF	2/26-2/27/04		
	Pipe Fittings	4	10/2-10/6/03		
In the interest of brevity for these example ASBESTOS ABATEMENT INFORMATION SHEETS, the materials and quantities are not listed for rooms 2, 4, 6 through 19, and 21 through 26. However, detailed information should be included for all abated rooms in the contractor's completed ASBESTOS ABATEMENT INFORMATION SHEETS.					
Media Center	Tan 9"x9" floor tile and mastic	40 SF	12/18-12/22/00		
	Gray Exterior Window Caulk 200 LF 4/19-4/13/04				

			12,10 12,22,00
	Gray Exterior Window Caulk	200 LF	4/19-4/13/04
	White interior window glazing	250 LF	4/19-4/13/04
Caleteria	Gold 12"x12" floor tile and mastic	100 SF	1/3-1/12/04
	Unit vent heat shield	5	1/3-1/12/04
	Pipe Fittings	3	1/19-1/21/04
Main Office	Off white 9"x9" floor tile and mastic	80SF	1/19-1/21/04
	Unit vent heat shield	1	1/19-1/21/04
	Pipe Fittings	1	1/19-1/21/04
Principle's Office	Off white 9"x9" floor tile and mastic	15 SF	1/19-1/21/04
	Unit vent heat shield	1	1/19-1/21/04
Vice Dringinle's	Pipe Fittings	1	1/19-1/21/04
Office	Off white 9"x9" floor tile and mastic	15 SF	1/19-1/21/04
	Unit vent heat shield	1	1/19-1/21/04
Stage	Pipe Fittings	5	1/26-1/27/04
Kitchen	Pipe Fittings	12	1/26-1/27/04

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

Location	Material		Quantity	Date Removed
DeilenDeem	Tank Insulation		100 SF	5/7-5/18/04
	Breeching		200 SF	5/7-5/18/04
Doller Koolli	Pipe Insulation		900 LF	5/7-5/18/04
	Pipe Fittings		73	5/7-5/18/04
	Tan 9"x9" floor tile and mastic	around unit	10 SF	1/29-2/2/04
K-1	vent			
	Gray Exterior Window Caulk		80 LF	4/17-4/19/04
	Tan 9"x9" floor tile and mastic	around unit	10 SF	1/29-2/2/04
K-2	vent			
	Gray Exterior Window Caulk		80 LF	4/23-4/24/04
S-1	1x1 ceiling tile - White with sm	all pinholes	4 SF	2/6-2/7/04
S-2	1x1 ceiling tile - White with sm	all pinholes	10 SF	2/7-2/8/04
S-4	1x1 ceiling tile - White with sm	all pinholes	12 SF	2/8-2/9/04
TOTALS				
2x4 CT		21,600 SF		
Pipe Insulation abov	e CT	290 LF		
Gray Exterior Windo	ow Caulk	1060 LF		
Pipe Fittings		78		
Green 12"x12" FT a	nd mastic	105 SF		
Unit vent heat shield	l	14		
Tan 9"x9" FT and m	astic	175 SF		
White interior windo	ow glazing	250 LF		
Gold 12"x12" FT and mastic		100 SF		
Off white 9"x9" FT and mastic		110 SF		
1x1 ceiling tile - White with small pinholes		26 SF		
Tank Insulation (Boiler Room)		100 SF		
Breeching (Boiler Room)		200 SF		
Pipe Insulation (Boil	ler Room)	900 LF		
Pipe Fittings (Boiler	Room)	73		

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

Reason for Choosing Response Action:

For systemic renovations of Example Elementary School.

DESCRIPTION AND EXPLANATION OF ENTIRE ABATEMENT ACTIVITY AND ENGINEERING CONTROLS UTILIZED. INCLUDE EXACT LOCATIONS, AMOUNTS AND TYPES OF ASBESTOS REMOVED, ENCAPSULATED OR ENCLOSED. ATTACH ADDITIONAL SHEETS IF NECESSARY.

Exact locations, quantities and asbestos containing materials abated are described in the preceding table.

Work areas requiring full containment were set up to contain two classrooms whenever possible. The following is a list describing the grouping of rooms per containment: 1 & 3; 5 & 7; 9 & 11; 13; 10; 8 & 6; 4 & 2; 12 & 14; 16 & 18; 15 & 17; 19 & 21; 23 & 25; 26 & 24; Main office, Principle's office & Vice Principle's office; Boiler Room. A total of 15 full containment work areas were set up during the job. All of the ACM listed in the preceding table for these rooms was abated under full containment except for the window caulking applications. Window caulking applications were abated and disposed of at a later date with the removal of the entire window system (which was treated as ACM).

Full Containment Procedures: All work was completed under full negative-pressure containment. All moveable objects were removed from the work area. All critical areas (windows, lockers, clocks, vents, etc.) and nonmoveable objects (bookcases) were sealed with two layers of 6mil poly. Walls were covered and sealed with one layer of 6mil poly and floors were covered and sealed with two layers of 6mil poly and one poly drop cloth. A three stage decon (clean room, shower room and equipment room) with air locks separating each room was constructed at the entrance to each containment. A moveable plywood partition was constructed in the hallway outside of each containment to provide a security barrier between the work area and employees/students at the school. The plywood barrier was approximately four feet wide, allowing access to other areas of the school.

Abatement of ACM was completed using wet methods, removing ACM in manageable size pieces, and bagging debris in black 6 mil poly bags as work occurred. All visible debris was picked up, bagged and removed from the work area at the end of each workday. Bags were removed from the work area through the shower room, where they were double bagged, and taken immediately to an off-site storage trailer. Following the completion of abatement work, final cleaning, and visual inspection, airless sprayers (spray encapsulant) and bridging encapsulant were used throughout the entire work area.

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

Pipe fittings located in the kitchen and above the stage were abated using glovebag procedures described in the specs for this job. A poly drop cloth was placed directly under the glovebag and covered an area five feet from the glovebag in all directions. The glovebag was properly sealed with all required tools inside the glovebag and smoke tested by the industrial hygienist to insure a proper seal. The fittings were then abated after thoroughly wetting the fittings and inserting and sealing a HEPA vacuum hose within the glovebag. Upon completion of abatement the areas were cleaned, sealed with bridging encapsulant, and the glovebags, debris, and tools were properly removed and disposed of.

Replacement 1x1 ACM ceiling tiles were removed from rooms S-1, S-2 and S-3 within mini-enclosures according to procedures described in the specs for this job. The ceiling tiles were glued to the ceiling with non-ACM mastic dots. Removal of the replacement ceiling tiles included the ACM ceiling tiles and all adjacent non-ACM 1x1 ceiling tiles. The containments were constructed with 2 layers of 6 mil poly sheeting on the floors and walls. Two workers used amended water to soak the ceiling tiles before removing and bagging them. HEPA vacuums were used to clean all debris from the work area. All poly, disposable clothing and debris were disposed of as asbestos waste.

Floor tile and associated mastic were removed from Room 22, Media Center, and the Cafeteria under modified containment procedures described in the specs for this job. Six (6) mil poly was used to build a "tent" with one entrance around the floor tile to be abated. All edges of the poly "tent" were sealed with duct tape. Amended water was used during abatement work. A HEPA vacuum was used during the entire process to clean any debris. Mastic remover was used to abate the mastic. Upon completion of abatement work the entire work area was wet wiped to clean any debris.

Windows separating the cafeteria and outside of the school building were removed under full containment methodologies described in the specs for this job. These are the only windows within the school required to be removed under full containment per the Maryland Department of the Environment (MDE). The windows were removed under full negative-pressure containment with a three-stage decon chamber inside of the building. The containment was set up four feet inside and four feet outside of the window. The exterior portion of the containment was constructed of plywood. Once the containment was inspected by the industrial hygienist the window was removed with as little disturbance as possible. The widow was wrapped and sealed in poly and set to the side for disposal. All remaining caulk on the building was scraped off and cleaned with a HEPA vacuum. Upon final cleaning (including the poly used to seal the window unit) and passing test results the containment was taken down and the sealed window was placed in a trailer for disposal.

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

Windows in rooms K-1, K-2, 2, 4, 5, 6, 7, 8, 9, 10, 11, and 13, were removed under modified containment methodologies. MDE granted a variance for these methodologies on September 28, 2000. The windows were unbolted from the inside and poly was used to seal the window from the inside of the room immediately adjacent to the window. Poly criticals were installed at doors to the classroom. Poly was placed on the ground outside of the window. Then all window panes were sealed with duct tape and caulking was scraped from the top, sides and bottom of the window's exterior using amended water and HEPA vacuums while scraping. The window was removed onto the poly where it was wrapped, sealed in poly and placed in a trailer for disposal. All sills, poly and the ground were vacuumed to remove any debris.

This is a summary of the work completed. All work was completed in accordance with the abatement and monitoring specifications for this job.

Description and Explanation of Transportation and Disposal of Asbestos:

Debris was double bagged or wrapped and sealed with 6mil poly and duct tape (windows with ACM applications) and labeled for transport.

Name of Disposal Site:	PST Reclamation
Address of Disposal Site:	4431 Sands Road
	Harwood, MD 20776

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

List all Personnel Assigned to Project. Include:

Name Classification (Worker, Supervisor, etc.) Accreditation # State of Accreditation Date of Accreditation Expiration of Current Accreditation Total # Hours Worked Signature Verifying Having Worked on Project

Name	Class	Accreditation #	State	Date	Expiration	Work Hours
Employee Name	Supervisor	123456	MD	1/1/03	1/1/04	N/A
Employee Name	Supervisor	123456	MD	1/1/03	1/1/04	N/A
Employee Name	Supervisor	123456	MD	1/1/03	1/1/04	N/A
Employee Name	Worker	123456	MD	1/1/03	1/1/04	N/A
Employee Name	Worker	123456	MD	1/1/03	1/1/04	N/A
Employee Name	Worker	123456	MD	1/1/03	1/1/04	N/A
Employee Name	Worker	123456	MD	1/1/03	1/1/04	N/A
Employee Name	Worker	123456	MD	1/1/03	1/1/04	N/A

Signature Verifying Having Worked on Project:

LIST OF EQUIPMENT:

Negative pressure ventilation units
HEPA vacuums
6-ml poly sheeting
Safety equipment (hard hats, gloves, goggles, etc.)
Protective clothing
Respirators
Bridging/spray encapsulant
Scaffolding
Ladders
Water w/surfactant
Spray bottles

EXAMPLE REPORT – INFORMATION WITHIN THIS REPORT IS NOT FACTUAL AND FOR REFERENCE ONLY

NAME OF PROJECT MONITORING FIRM:

Example Monitoring, Inc.

PROJECT DESIGNER NAME:	John Doe	
PROJECT DESIGNER ACCRED. # & S	STATE:	123456 Maryland
COMPANY AFFILIATION:	Example Asbestos Removal, Inc.	
COMPANY ADDRESS:	555 Pulaski Highway Baltimore, MD 21237	

ENCLOSED SHOULD BE THE FOLLOWING: STATE/EPA NOTIFICATION OF ASBESTOS PROJECT SHEET; COUNTY WASTE DISPOSAL APPROVAL; LANDFILL RECEIPT; PROJECT DESIGN PAPERWORK; ANY OTHER CORRESPONDENCE OR INFORMATION PERTAINING TO THE ABATEMENT.

REMINDER: ALL AHERA, FEDERAL, STATE AND LOCAL REQUIRMENTS ARE EFFECTIVE FOR B.C.P.S. WORK.

Signature of Chief Officer or Designee

John Doe

Name and Title (Typed)

August 15, 2004 Date

SPECIFICATIONS FOR HAZARDOUS MATERIALS ABATEMENT

020820-37

3.0 PROCEDURES FOR THE IDENTIFICATION OF PCB LIGHT BALLASTS; AND FOR REMOVAL, INCINERATION AND/OR RECYCLING OF PCB LIGHTING BALLASTS AND FLUORESCENT LIGHT TUBES/BULBS.

3.1 SUMMARY OF WORK

- A. Procedure for identification of PCB lighting ballasts as required for bidding and construction purposes.
 - 1 The Contractor is responsible for determining PCB versus Non-PCB for ballasts that are disposed.
 - 2. Any ballasts that are removed during the course of renovation, that will not be re-installed at the school, must be visually examined for a NON-PCB designation. The words "NON-PCB" will be printed on the manufacturer's label or elsewhere on the ballast. The words "NON-PCB" may be part of the original manufacturer's label text or may be separately stamped on the label or outer surface of the ballast.
 - 3. NON-PCB Ballasts: Fluorescent light fixture ballasts that are visibly labeled as "NON-PCB" are considered non PCB-contaminated.
 - 4. PCB Ballasts: Ballasts with no visible "NON-PCB" labeling are considered PCB ballasts (either PCB-contaminated or PCB-containing).
- B. Non-PCB ballast disposal: Any non-PCB ballasts that are removed during the course of renovation, and that will not be re-installed at the school can be discarded as standard construction waste. Non-PCB ballasts shall not be treated as hazardous waste.
- C. Procedure for the removal, pick-up, Incineration, Recycling, and Disposal of PCB lighting ballasts and fluorescent light tubes/bulbs as required by BCPS.
 - 1. PCB Ballasts: Any PCB ballasts that are removed during the course of renovation, and that will not be re-installed at the school must be segregated from the standard waste stream and handled as hazardous waste. PCB ballasts must be recycled as hazardous waste.
 - Fluorescent Light Tubes/Bulbs: All fluorescent light tubes/bulbs that will be disposed must be treated as hazardous waste. Any tubes/bulbs that are removed during the course of renovation, and that will not be re-installed into a light fixture cannot be discarded with standard trash. The light tubes/bulbs must be recycled as hazardous waste.
 - 3. The Contractor shall furnish all necessary manifesting, labor, materials (including 55 gallon DOT drums and liners for ballasts and recycle containers for bulbs), equipment, and other incidentals needed to properly pack, store, remove, haul, and dispose of PCB light ballasts and fluorescent light tubes/bulbs from the site. Work shall be performed in strict accordance with all Federal, Environmental Protection Agency, Department of Transportation, OSHA, State, Maryland Department of the Environment, and local Government agency regulations.

3.2 COORDINATION

- A. Requests for the delivery and pick-up of waste containers will be coordinated by the Contractor.
- B. Pick-ups will be made during normal business hours, Monday thru Friday, 8:00am to 3:30pm, unless otherwise approved by the BCPS Project Manager.
- C. An EPA ID number will be obtained for the site as required for the pick-up of PCB Ballasts and/or fluorescent light bulbs.
- D. Waste Hauler contractors shall report to the main office of the school to identify themselves and to alert school administrators as to the work they will be performing at their site.

3.3 PERSONAL PROTECTIVE EQUIPMENT

A. The Contractors' personnel shall be equipped with and use all personal protective clothing and equipment necessary to safely handle product waste containers. Use of personal protective clothing and equipment shall be consistent with requirements and recommendations of the Occupational Safety and Health Administration (OSHA), the EPA, and/or the recommendations of the BCPS Project Manager and/or BCPS' Environmental Services staff. The minimum level of personal protective equipment required in the handling of waste containers shall include chemical resistant gloves, safety shoes or boots, a work uniform, and appropriate eye protection. All such equipment shall be supplied and properly maintained by the Contractor.

3.4 IDENTIFICATION AND PACKAGING

A. Pick-ups shall be conducted at the facility. Contractor personnel shall evaluate the individual waste containers to ensure that they are properly identified and can be safely handled and transported. Contractor personnel shall then perform an inventory and inspect drums to ensure approval as shipping containers according to DOT and EPA requirements and treatment, disposal, or recycling facility requirements.

3.5 PROPERLY TRAINED AND CERTIFIED PERSONNEL

A. Pick-ups shall be carried out by professionally trained and specifically qualified as required by OSHA, DOT, EPA, and MDE to evaluate and safely manage the hazards associated with handling, sorting, packaging, and transporting regulated products. All personnel must meet applicable medical, training, and licensure requirements of Federal, State, and local agencies having jurisdiction over regulated waste handling, transportation, and disposal activities.

3.6 PERMITS AND CERTIFICATIONS

A. The Contractor must be approved by the Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE) as a certified hazardous waste hauler. The Contractor's facility shall be approved as a Commercial Storage Facility under the EPA's TSCA regulations. Contractor's personnel shall be HAZWOPER trained with supervisors being OSHA certified.

3.7 PACKAGING

- A. Hazardous waste shall be transported in DOT approved containers that shall preclude the loss of any of the material to the environment.
- B. Containers must be properly labeled in accordance with EPA and DOT regulations.

3.8 LICENSES - HAZARDOUS WASTE

- A. Contractors must submit copies of their Hazardous Waste Haulers Transporters license approved by the EPA and MDE, as well as haulers licenses for other transporters proposed for participation in transporting the PCB laden ballasts or Fluorescent Light Bulbs from the site.
- 3.9 PERMITS AND MANIFESTING
 - A. Contractor shall be responsible for obtaining all necessary permits. All manifests required for hauling and disposal of materials must be prepared by the Contractor and are subject to review and approval by BCPS and the Baltimore County Department of Environmental Protection and Resource Management.
 - B. All manifests, profiles, Bills of Lading, etc. are to be forwarded to the BCPS Project Manager.

3.10 TREATMENT AND/OR DISPOSAL

- A. The disposal facility shall be an EPA approved treatment and storage or disposal facility, licensed for the Incineration or Recycling of PCB lighting ballasts and fluorescent light bulbs.
- B. Use of Permitted Facilities with Full Status Required: The Contractor shall be responsible for providing treatment, disposal, or recycling of all waste collected at the facility in accordance with applicable Federal, State, and local regulations. Wastes shall be transported to facilities that have been issued operation permits pursuant to the Resource Conservation and Recovery Act (RCRA) and as implemented by the hazardous waste regulatory authorities of jurisdiction. General information about the facility and copies of permits or operational violations shall be available for review by the BCPS Project Manager.
- C. Use of Land Disposal Discouraged: The land disposal of wastes shall be kept to the smallest amount feasible. Secured chemical landfills shall only be employed by the Contractor when no other practical method of treatment or disposal for a particular waste is available. The Contractor shall maximize the use of treatment facilities that employ validated, best available technologies to permanently destroy or render wastes non-hazardous.
- D. The Contractor must supply the BCPS Project Manager a Certificate of Disposal or Destruction or Recycling, and a copy of the completed manifest (signed-off by all handlers of the waste) for each shipment of hazardous waste generated.

3.11 OTHER SERVICES

A. The Contractor shall provide Emergency Response Services in the event of an uncontrolled release of hazardous or non-hazardous materials from an accident or fire, or transportation accident on any of the grounds in the serviced location. In the event of an incident, Contractor shall notify the BCPS Project Manager immediately, as well as the Maryland Department of the

Environment to report the release of a regulated substance.

4.0 LEAD-BASED PAINT (LBP), LEAD MATERIALS, AND LEAD SURFACES

4.1 PROCEDURES FOR HANDLING AND REMOVING LBP, LEAD MATERIALS, AND LEAD SURFACES

- A. Renovation activities disturbing LBP, lead materials (materials other than paint film containing greater than 0.7mg/cm2 lead concentration), lead surfaces (including painted surfaces and other materials containing less than or equal to 0.7mg/cm2) must be handled in accordance with the requirements of the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and Maryland OSHA regulations. Contractor representatives and sub-contractors must be notified of the presence and location of LBP, lead materials, and lead surfaces so their workers and the environment can be adequately protected.
- B. Regulations of OSHA Lead in Construction standard (29 CFR, 1926.62) with Maryland amendments must be adhered to during demolition or renovation activity which disturbs LBP, lead materials, and lead surfaces. These regulations require employers to use engineering controls such as HEPA filtered vacuum equipped tools and special work practices to reduce worker exposure to lead. These regulations also require exposure monitoring, biological monitoring, and employee training when a worker is exposed to airborne lead levels at or above the action level.
- C. Disturbance of LBP, lead materials, or lead surfaces is defined as follows: Any of the following activities involving LBP, lead materials, or lead surfaces 1) dismantling, paint-stripping, demolition, cutting, sawing, drilling, or abrading, or 2) attachments or penetrations to doors, windows, frames, trim surfaces, walls, ceilings, floors, or painted pipes. All disturbances to LBP, lead materials, and lead surfaces must include procedures to minimize disturbance, protect the school from spread of lead dust, and contain and clean up all dust and debris.
- D. Disturbance or removal of LBP and/or lead materials shall be performed by a licensed leadabatement Contractor.
- E. Disturbance or removal of lead surfaces shall employ procedures for protection of building components, building contents, and the owner's property from airborne or settled dust; and dust-free clean up must be completed.
- F. Disposal of LBP, lead materials, lead surfaces and debris from LBP, lead materials, and lead surfaces must be conducted in accordance with Resource Conservation and Recovery Act (RCRA) regulatory requirements. Toxic Characteristic Leaching Procedures (TCLP) testing is required to determine if waste must be disposed of as lead hazardous waste.
- G. The lead screening report lists all lead testing results. Exact lead concentrations of all test surfaces are listed. Note that a "negative" finding only means that the surface is below ≤0.7 mg/cm2, the legal limit for lead paint. This does not necessarily mean that the surface is safe to work with and will not produce an exposure if cut, sanded or burned. A certified lead paint risk assessor should be consulted prior to performing any of the Contract work for an interpretation of the data in the report. All of the testing results shall be reviewed, and the impact on all painted surfaces shall be evaluated. The school shall be protected from lead-contaminated dust associated with disturbance of paint and other surfaces and materials containing any concentration of lead.

- H. Torch cutting and welding of any surface or material, containing any concentration of lead, shall be conducted after hours with the building empty, unless the Contractor obtains authorization from BCPS's Project Manager. Doors and other structural openings between the work area and adjacent interior building areas shall be sealed to prevent migration of fumes. Ventilation shall be provided which actively removes air and fumes from the work area to the building exterior: establishing a quasi negative-pressure condition in the work area.
- I. LBP surfaces and materials can be drilled utilizing HEPA-equipped tools that are manufactured and designed to capture all generated dust. At completion of drilling, all surrounding and underlying surfaces shall be clean of all dust utilizing an amended water solution. The Industrial Hygienist must monitor the work procedures and clean up; and, workers must be properly trained.

4.2 ABATEMENT SCOPE OF WORK FOR LBP, LEAD MATERIALS, AND LEAD SURFACES

- A. The lead abatement scope of work shall be determined by the Bidder. Known locations and quantities of LBP, lead materials and lead surfaces are listed within the lead screening report. The lead screening report, Lead Abatement Table, Lead Abatement Notes, Specifications and Drawings shall be used as guides to assist the Contractor in determining the lead abatement scope of work. The Contractor must examine the lead screening report and make their own investigation and assessment of the site.
- B. The lead abatement scope of work includes locations and quantities of lead abatement that are not specifically listed on the Lead Abatement Table; nor described in the Lead Abatement Notes; nor shown on drawings; nor described in any other specification section. The lead abatement scope of work includes LBP, lead materials, and lead surfaces which will be directly disturbed due to renovation activities and which require abatement to maintain or create safe working conditions (in accordance with OSHA guidelines). The specifications, drawings, and lead abatement table may not describe and/or illustrate every detail of work required to complete the renovation scope of work. Every area/space and material disturbance along the path of renovation is not described in the specifications, drawings or lead abatement table. The Contractor is responsible for reviewing the lead screening report; understanding the distribution of LBP, lead materials and lead surfaces throughout the school; comparing the renovation scope of work to the lead screening report findings; and determining the lead abatement scope of work required to complete the renovation. The Contractor shall estimate lead abatement in hidden or concealed areas of the building(s) based on quantities and locations referenced in the lead screening report, and the Contractor shall adjust their bid accordingly.
- C. Presumed locations and quantities of LBP, lead materials and lead surfaces are listed within the HazMat sections of the Specifications. The Contractor is responsible for all costs associated with investigation, sampling, analyses, and abatement.

5.0 BCPS ON-CALL ABATEMENT AND INDUSTRIAL HYGIENE CONTRACTORS

Approved Hazardous Materials Contractors				
	INDUSTRIAL HYGIENISTS (Reference only – IH HIRED BY BCPS)	(Oth	ABATEMENT CONTRACTORS er Qualified Abatement Contractors May Be Used On The Owner's Sites)	
1.	Advanced Air Analysis, Inc. 8 Sudbrook Lane Main Building, 2 nd Floor Baltimore, MD 21208 410-653-7676 410-486-5200 FAX Alexander Fridman	1.	A-L Abatement, Inc. 4505 Fitch Avenue Baltimore, MD 21236 410-882-3166 410-882-3170 FAX Larry King	
2.	Aerosol Monitoring & Analysis, Inc. 1331 Ashton Road, Box 646 Hanover, MD 21076-0646 410-684-3327 410-684-3384 FAX Todd Woerner	2.	Colt Insulation, Inc. 2901 Dede Rd., Suite B Finksburg, MD 21048 410-833-3383 x26 410-833-3389 FAX David Paetow	
3.	I H Services, Inc. 1831 Portal Street, Suite E Baltimore, MD 21215 410-633-4000 410-633-4122 FAX David Patak/Scott Richardson	3.	Goel Services, Inc. 6201 Dix Street NE Washington, DC 20019 202-465-6900 202-457-0105 FAX Piyush J. Goel	
4.	Tidewater, Inc. 8990 Route 108, Suite D Columbia, MD 21045 410-997-4458 410-997-8713 FAX Bruce Reynolds	4.	NCM Demolition and Remediation, LP 3900 Vero Road Baltimore, MD 21227 410-247-5031 David Rymers	

Baltimore County Public Schools

6.0 ASBESTOS AND LEAD ABATEMENT NOTES

7.0 ASBESTOS AND LEAD ABATEMENT TABLES

8.0 HAZARDOUS MATERIALS REPORTS
HAZARDOUS MATERIALS SURVEY REPORT

Lansdowne Elementary School 2301 Alma Road Baltimore, Maryland 21227



Prepared for:

Grimm and Parker Architects 11720 Beltsville Drive, Suite 600 Calverton, Maryland 20705

September 20, 2016

Prepared by:



200 Fairbrook Drive • Suite 201 • Herndon, Virginia • 20170 (703)648-0822 • appenv.com

1148-16-0225

HAZARDOUS MATERIALS SURVEY REPORT

Lansdowne Elementary School 2301 Alma Road Baltimore, Maryland 21227

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HAZARDOUS MATERIALS SURVEY REPORT

Lansdowne Elementary School 2301 Alma Road Baltimore, Maryland 21227

1.0 EXECUTIVE SUMMARY

Applied Environmental, Inc. conducted a hazardous material survey of Lansdowne Elementary School, located at 2301 Alma Road, Baltimore, Maryland, which included an intrusive survey for Asbestos-Containing Material (ACM), and a non-intrusive survey for lead-containing surface coatings, light tube ballasts that may contain Polychlorinated Biphenyls (PCBs), and mercury-containing articles such as fluorescent light tubes and thermostats. This survey was performed by a team of Environmental Protection Agency (EPA) accredited and State of Maryland licensed asbestos and lead inspectors on select dates from August 15 through 23, 2016. In addition, the roofing system was sampled at the time of the survey. It is our understanding that all interior building components in the structure will be demolished and removed. Drawings of the first floor and roof are attached in Appendix E, showing room numbers that sampling locations can be cross referenced to.

As a result of the survey, multiple types of ACM were identified. A list is provided in Section 4.1. Leadcontaining painted components were also identified. Testing results are presented in Appendix D. No PCBcontaining light ballasts were observed. Light tubes are assumed to contain mercury. No mercury thermostats were observed.

2.0 BUILDING DESCRIPTION

Lansdowne Elementary School was originally built in 1963 with minor renovations in 1971, 1983, 1984, 2006, and 2007. The building comprises approximately 50,985 square feet contained in a single story with a crawl space. The exterior of the building is constructed of brick masonry and mortar. Interior wall systems consist of concrete masonry units, gypsum board, and ceramic wall tile over concrete. Ceilings consist of suspended ceiling board decking above suspended ceiling tiles and textured plaster ceilings. Floor coverings throughout the majority of the building consist of vinyl floor tile over a concrete sub floor. Ceramic flooring and wall tile were present in the faculty restrooms and kitchen areas, while terrazzo flooring and ceramic wall tile were found throughout the corridors and restrooms.

The existing roof is a built-up roof system with pea gravel.

The piping systems throughout the building were primarily insulated with fiberglass with plastic vinyl fittings. In area where demolition had been performed, the exposed mudded fitting within the pipe chase was insulated with mudded insulation. The visible ducting systems were insulated with fiberglass insulation, and some were bare metal. A brief description of our approach to the survey is presented in Section 3.0 of this report.

3.0 SURVEY AND EVALUATION PROCEDURES

3.1 Asbestos-Containing Materials Survey

This comprehensive asbestos building survey was conducted by a team of Environmental Protection Agency (EPA) accredited and State of Maryland licensed asbestos inspectors. Insulating and building construction materials considered to be suspect ACM were identified and sampled in accordance with AHERA 40 CFR 763 and OSHA Standard 29 CFR 1926.1101 inspection and sampling protocol.

Building materials evaluated during the survey were placed in one of three categories listed below:

- Surfacing materials including spray applied or troweled on wall/ceiling coatings, fireproofing materials, and acoustical treatments.
- Thermal system insulation including plumbing and HVAC system insulation.
- Miscellaneous materials including ceiling tiles, acoustical wall tiles, adhesive on acoustical wall tiles, wall panel insulation, floor tiles/mastic, resilient sheet flooring, fire doors, and gypsum board joint compounds.

Suspect ACM was separated into homogeneous areas. A homogeneous material is defined as a building material that is uniform in color and texture. A homogeneous area, once identified, is placed into one of the three categories listed above, and sampled in accordance with the AHERA protocol which prescribes the number of samples to be collected. Each homogeneous area was also evaluated to determine its current condition. The existing locations and quantities of ACM are noted in Appendix A, "Homogeneous Material List".

3.2 Lead-Containing Surface Coating Screening Survey

The lead-containing surface coating screening survey was performed to measure lead concentrations of typical painted surfaces in order to provide information to contractors to take precautions and comply with the OSHA "Lead in Construction" Standard (29 CFR 1926.62).

The lead paint survey was performed using a Niton XLp 300A Spectrum X-Ray Fluorescence (XRF) analyzer. The Niton XLp 300A is a hand held, portable lead detector, capable of immediately determining lead concentrations of tested surfaces in a non-destructive manner. The detection level of the Niton XLp 300A is 0.1 milligrams of lead per square centimeter (mg/cm²) of area tested. Please note that there may be concentrations of lead below this detection limit present throughout the property. The XRF calibration was validated in accordance with the manufacturer's instructions. During the survey, 80 surfaces were tested. Typical surfaces tested by the XRF included, but were not limited to, wall systems, door systems, ceilings, stair components, window components, floors, heater casings, and support beams. Lead-containing paint was detected on multiple building system components.

3.3 Polychlorinated Biphenyl Verification and Mercury-Containing Articles Survey

According to the EPA, all ballasts manufactured prior to July 1978 have a greater than 50% chance of containing PCBs at 50 parts per million (ppm) in their potting material. Ballasts manufactured after July 1978 are required to bear a "No PCBs" label indicating that they do not contain PCBs. Our survey consisted of visually inspecting 10 to 15 % of the light ballasts.

3.4 Accessibility Limitations

Where possible, the presence of plumbing lines, or other systems observed to penetrate into inaccessible locations were noted, and considered to be consistent with adjacent accessible areas. Select locations within wall systems, behind chalkboard, and pipe chases were accessed as part of our destructive sampling; however, significant demolition activities were not performed as part of this survey. Suspect ACM were sampled at locations noted. Mudded elbow joints are assumed to be between floors, within finished enclosed walls and ceilings, and in sealed pipe chases.

Should these inaccessible interstitial areas be impacted in the future, they must be evaluated to determine if any material present is considered homogenous with other material samples, or appropriately sampled by an accredited asbestos inspector. Suspect materials are assumed to be asbestos-containing until confirmed otherwise by laboratory analysis.

4.0 RESULTS

4.1 Asbestos-Containing Materials

All identified homogenous materials considered to be potentially asbestos-containing, and assumed ACM of each building are indicated in Appendix A, "Homogenous Material List". The laboratory reports are included in Appendix B, "Bulk Sample Analytical Reports". The laboratory report provides results of all samples collected, and the percentage quantities of the entire sample composition (i.e., asbestos-containing and non-asbestos-containing).

The following materials were identified as asbestos-containing:

- 9" x 9" beige with light green streaks floor tile,
- 9" x 9" tan with brown, white, and orange streaks floor tile,
- 9" x 9" beige with brown flecks floor tile,
- 9" x 9" light green with green flecks floor tile,
- 9" x 9" olive green with green streaks floor tile,
- Black tar (vapor barrier) on exterior perimeter wall,
- Black chalkboard/bulletin board adhesive, and
- Gray powdery mudded joint on fiberglass insulated pipe.

During our destructive sampling, a mudded joint elbow was observed in the Classroom 4 pipe chase next to the side exit door. The elbow was sampled and reported by the laboratory as containing greater than one percent asbestos. Therefore, the Baltimore County Public School representative, Mr. Dean Cymek, recommended to assume that there are two mudded elbow joints within all classroom pipe chases that are located near the side exit doors. It should be noted that fire doors were also assumed to be asbestos-containing and were not sampled by Applied Environmental, to maintain the integrity and

function of these materials. These fire doors were identified by UL fire rating plates located on the doorjamb. Therefore, all fire doors throughout the building should be treated as asbestos-containing until sampling determines otherwise.

4.2 Lead-Containing Surface Coatings

XRF analysis detected lead readings in excess of the unit detection limit on the following building components:

- Door systems,
- Window systems,
- Walls,
- Lobby support post,
- Ceramic tile walls and baseboards,
- Concrete boiler room floor,
- Plaster ceilings,
- Convector casings,
- Stair components, and
- Support beams.

Additional information regarding these components is provided in Appendix C, "XRF Lead-Containing Components".

XRF testing did not detect lead above the detection limit on any other surfaces tested. Refer to Appendix D, "XRF Lead Testing Results" for a complete listing of all readings performed by the XRF analyzer. The "Floor" and "Room" columns further define the location of the tested surface. Individual building components tested are listed under "Component". The substrate on which the paint film is applied is noted under "Substrate." The condition of the tested component is noted under "Condition." The color of the topcoat layer of paint is noted under "Color," to assist in determining the location of the building components tested. The actual concentration of lead is recorded in the "PbC" column in the noted units, mg/cm².

As this was a screening survey, Applied Environmental recommends that building components identified with lead-containing surface coatings in specific areas of the building be assumed to have similar surface concentrations of lead throughout the rest of the building, and be handled in accordance with OSHA's lead standard until additional XRF testing or paint chip analysis proves otherwise.

4.3 Polychlorinated Biphenyls and Mercury Light Tubes

Based on our survey of light fixtures within the building, a representative number of light ballasts were inspected, all were marked with labeling indicating "No PCBs", and are assumed not to contain PCBs. In addition, the fluorescent light tubes may contain quantities of mercury that require disposal as universal waste; however, the tubes should be re-used elsewhere or properly disposed of as universal waste at the end of their life cycle. No mercury thermostats were observed within the building.

5.0 RECOMMENDATIONS

5.1 Asbestos-Containing Materials

The asbestos-containing floor tiles, black chalkboard adhesive, fire doors, and black vapor barrier are non-friable materials as defined by NESHAP. A non-friable ACM is defined as any material that contains more than one percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. The majority of the non-friable ACM were observed to be in good or fair condition. It is expected that the non-friable material will become friable during demolition; therefore, these materials should be removed prior to demolition.

The asbestos-containing mudded elbows are considered friable materials as defined by NESHAP. A friable ACM is defined as any material containing greater than one percent asbestos that, when dry, can be crumbled, pulverized or reduced to powder with hand pressure. The friable ACM were observed to be damaged significantly.

The identified friable ACM must be removed prior to demolition activities by a qualified State of Maryland licensed asbestos abatement contractor prior to interior demolition of the building components, in accordance with applicable EPA, OSHA, and State of Maryland regulations.

The OSHA Asbestos in Construction Standard, 29 CFR 1926.1101 requires that any contractor performing work impacting materials that contain asbestos be notified of the testing results, and take appropriate actions to comply with the requirements of the OSHA Standard. Notification should be made in writing and receipted

Applied Environmental has made every effort to locate ACM throughout the surveyed areas. However, access above fixed plaster ceilings and wall cavities was limited. Asbestos-containing mudded fittings should be assumed present within wall chases, between floors, and above fixed ceilings where plumbing systems are expected to be present. Precautions must be taken when walls and ceilings are penetrated, to avoid impact to asbestos insulation in the wall cavities.

5.2 Lead-Containing Surface Coatings

All construction activities that involve lead are regulated by the OSHA "Lead in Construction Standard" (29 CFR 1926.62). The standard does not define a specific concentration of lead, which must be present within paint for it to be considered "lead-containing." Therefore, painted and glazed surfaces that have detectable concentrations of lead must be handled in accordance with the OSHA Lead in Construction Standard.

Any contractor performing work that could impact paint films that have detectable concentrations of lead should be informed of the testing results, and must take appropriate actions to comply with OSHA standards. These appropriate actions include performing air monitoring to measure worker exposure and assuring that the workers are provided with adequate respiratory protection and the appropriate training.

The disposal of lead paint waste generated during demolition operations is regulated by EPA Standard 40 CFR 261, Subpart C. This regulation requires that a Toxicity Characteristic Leaching Procedure (TCLP) test be utilized to determine if the lead paint waste is considered hazardous. A material is considered hazardous if it is ignitable, reactive, corrosive, or toxic. TCLP testing was not included in the scope of work.

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5.3 Polychlorinated Biphenyls and Mercury Light Tubes

During any project requiring the removal of light ballasts, each should be separately inspected for the "No PCBs" ballast labeling that is required to be on ballasts that do not contain PCBs. If "No PCBs" is not labeled on the ballast, the ballast must be assumed to contain PCBs, and properly disposed of as hazardous waste.

All fluorescent light tubes contain some mercury. We recommend that light tubes be used to their full life span, and then disposed of as universal waste at the end of their life cycle.

APPENDIX A

HOMOGENEOUS MATERIAL LIST



Homogeneous Material List (Material Suspected of Being Asbestos-Containing)

Lansdowne Elementary School 2301 Alma Road, Baltimore, Maryland

August 2016

Mat. Code	Material Description	Friable (Yes/No)	Location	Sample Numbers	ACMª (Yes/No)	Approx. Quantity*
FT1	12" x 12" tan with brown mottle floor tile	No	Classrooms 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, Rooms S1, S2, S3, S4, Speech, Reading, and Main Office spaces	01, 03	No	
FM1	Brown mastic associated with 12" x 12" tan with brown mottle floor tile	No	Classrooms 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, Rooms S1, S2, S3, S4, Speech, Reading, and Main Office spaces	02, 04	No	
FT2	9" x 9" beige with light green streaks floor tile	No	Faculty, Gymnasium and associated storages, and Room S14	<mark>05</mark> , 07	Yes	5,110 s.f. ^b .
FM2	Black mastic associated with 9" x 9" beige with light green streaks floor tile	No	Faculty, Gymnasium and associated storages, and Room S14	06, 08	No	
FT3	9" x 9" tan with brown, white, and orange streaks floor tile	No	Rooms S5, S6, S7, S8, S9, S10, S12, S13, stage side entrance, kitchen office, and storage/AHU room behind stage	09, 11	Yes	1,512 s.f.
FM3	Black mastic associated with 9" x 9" tan with brown, white, and orange streaks floor tile	No	Rooms S5, S6, S7, S8, S9, S10, S12, S13, stage side entrance, kitchen office, and storage/AHU room behind stage	10, 112	No	-
FT4	9" x 9" beige with brown flecks floor tile	No	Classroom 18 and Health Suite	<mark>13</mark> , 15	Yes	1,417 s.f.
FM4	Black mastic associated with 9" x 9" beige with brown flecks floor tile	No	Classroom 18 and Health Suite	14, 16	No	
FT5	9" x 9" light green with green flecks floor tile	No	Classroom 20	17, 19	Yes	877 s.f.
FM5	Black mastic associated with 9" x 9" light green with green flecks floor tile	No	Classroom 20	18, 20	No	
FT6	12" x 12" brown with dark brown mottle floor tile	No	Library and Computer Room	21, 23	No	
FM6	Brown mastic associated with 12" x 12" brown with dark brown mottle floor tile	No	Library and Computer Room	22, 24	No	
FT7	12" x 12" beige with blue and brown specks floor tile	No	Classroom K1	25, 27	No	
FM7	Yellow mastic associated with 12" x 12" beige with blue and brown specks floor tile	No	Classroom K1	26, 28	No	1
FT8	9" x 9" olive green with green streaks floor tile	No	Guidance Office	<mark>29,</mark> 31	Yes	120 s.f.
FM8	Black mastic associated with 9" x 9" olive green with green streaks floor tile	No	Guidance Office	30, 32	No	
WS1	Black board will sill	No	Main Office spaces, Faculty, and Health Suite	33, 34	No	
SM1	White seam mastic on fiberglass insulated duct foil	No	Corridor outside gymnasium above suspended ceiling tile	35, 36	No	
SM2	Brown seam mastic on fiberglass insulated duct foil	No	Corridor outside gymnasium above suspended ceiling tile	37, 38	No	
VB1	Black tar (vapor barrier) on exterior perimeter wall	No	Throughout perimeter walls	<mark>39,</mark> 40, 41, 42, 43, 44, 45	Yes	8,650 s.f.
SM3	Gray seam mastic on metal ducting system	No	Boys and Girls restrooms, and selected areas	46, 47	No	



Homogeneous Material List (Material Suspected of Being Asbestos-Containing)

Lansdowne Elementary School 2301 Alma Road, Baltimore, Maryland

August 2016

Mat. Code	Material Description	Friable (Yes/No)	Location	Sample Numbers	ACMª (Yes/No)	Approx. Quantity*
CT1	2' x 4' white with worm like gouges and pinholes ceiling tile	Yes	Faculty, Health Suite, Cafeteria, classrooms, S3, S4, S12, S13, and S14	48, 49	No	
CT2	2' x 4' white with fissures and pinholes ceiling tile	Yes	Classroom K1	50, 51	No	
СТЗ	2' x 4' white smooth surface (drywall) ceiling tile	Yes	Restrooms and throughout kitchen	52, 53, 63	No	
CT4	2' x 4' white with decorative gouges and pinholes ceiling tile	Yes	Corridors, Main Office	54, 55	No	
FC1	Blue woven fire curtain	No	Stage and window curtains	56, 121	No	
WC1	Gray interior window caulk	No	Throughout	57, 58	No	
WT1	4' x 4' white with fissures and pinholes wall tile	Yes	Classroom 16	59, 60	No	
WM1	Brown mastic associated with 4' x 4' white with fissures and pinholes wall tile	No	Classroom 16	61, 62	No	
CP1	Brown ceiling deck panel	No	Throughout	64, 65, 66	No	
TZ1	Multi-color terrazzo flooring	No	Throughout corridors, restrooms, and custodial closet	67, 68	No	
CB1	Black chalkboard/Bulletin board mastic	No	Throughout classrooms	<mark>69,</mark> 70	Yes	51 ea.º
CK1	White sink caulk	No	Restrooms	71, 72	No	
WC2	Gray exterior window caulk	No	Throughout	73, 74	No	
DJ1	Gypsum wall board with joint compound on skylight	No	Throughout skylight walls	75, 76, 77	No	
MJ1	Gray powdery mudded joint on fiberglass insulated pipe	Yes	Throughout classroom chases near side exit doors	78	Yes	41 ea.
DC1	Gray exterior door caulk	No	throughout	79, 80, 81, 82	No	
DC2	White interior door caulk	No	Throughout	83, 84, 85	No	
PL1	Two-coat textured ceiling plaster	No	Equipment Room	86, 87, 88	No	
DJ2	Gypsum ceiling board with joint compound	No	Equipment Room	89, 90	No	
PL2	Two-coat wall plaster	No	Throughout classroom near sinks	91, 92, 93	No	
PL3	Two-coat ceiling plaster	No	C2, C3, Custodial Closet, and Recreational storage rooms	94, 95, 96	No	
DJ3	Gypsum ceiling board with joint compound	No	Throughout classrooms above side exit doors, S11 ceiling and near corridor doors	97, 98, 99	No	
AR1	Asphalt roofing tat with pea gravel (top layer)	No	Roof	100, 101	No	
RI1	Roof insulation with black felt (mid layer)	No	Roof	102, 103	No	
AR2	Asphalt roofing tar (bottom layer)	No	Roof	104, 105	No	
DM1	Gray mastic on fiberglass insulated duct foil	No	Roof	106, 107, 108	No	



Homogeneous Material List

(Material Suspected of Being Asbestos-Containing)

Lansdowne Elementary School 2301 Alma Road, Baltimore, Maryland

August 2016

Mat. Code	Material Description	Friable (Yes/No)	Location	Sample Numbers	ACMª (Yes/No)	Approx. Quantity*
ST1	Black stair tread	No	Roof – metal ladders to gymnasium and cafeteria roofs	109, 110	No	
FL1	Gray flashing on vent	No	Roof	111, 112	No	
RS1	Roof shingle on vent	No	Roof	113, 114	No	
FL2	Black flashing on perimeter	No	Roof	115, 116	No	
RS2	Roof shingle on perimeter	No	Roof	117, 118	No	
WC2	Gray exterior window caulk	No	Roof – Gymnasium windows	119, 120	No	
		Assumed As	sbestos-Containing Materials			
FD1	Fire Door	No	Throughout	Not Sampled	Assumed	104 ea.
MJ1	Gray powdery mudded joint on fiberglass insulated pipe	Yes	Assumed between floors, within finished enclosed walls and ceilings, and in sealed pipe chases	78	Yes	50 ea.
^a ACM = A	sbestos-Containing Material.	^b s.f. = square	feet ^c ea. = each			

*The quantity estimates provided are for information purposes only and shall not be used as the sole basis for bidding. The Contractor shall verify the accuracy of stated measurement or condition prior to submitting bid. Also, the Contractor shall base his bid on his own data and measurement takeoffs and not solely on provided data.

APPENDIX B

BULK SAMPLE ANALYSIS REPORTS

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Certificate of Analysis

NV

 Date Collected:
 08/29/16

 Date Received:
 08/30/16

 Date Analyzed:
 09/09/16

 Date Reported:
 09/09/16

 Project ID:
 16028252

Test Requested:

Applied Environmental

Herndon, VA 20170

Attn:Osman Sharif

200 Fairbrook Dr. Suite 201

3002, Asbestos in Bulk Samples

Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

Client Project Name: Job# 1148-16-0225 Grimm & Parker

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

			Homo-	Number	Percent of	Asbestos	Detected	Non-Asbestos	Non-Fibrous	Matrix
Sample Id	entification	Client's Physical Description of Sample;	geneous	of	Sample (%)	<u>Chrysotile</u>	Amphibole	Fibers	Material	Material
Client	Lab Sample Number		(yes/no)	Layers	pro (, e)	(%)	(%)	(area %)	(area %)	(composition)
01	16028252-001	12" x 12" Tan with Brown Mottle Floor Tile Classroom 2	Yes	1	100	NDI	ND1		100	C, B, OP
02	16028252-002	Brown Mastic Associated with 12" x 12" Tan with Brown Mottle Floor Tile Classroom 2	Yes	1	100	NDI	NDI	CELL (3)	97	Т, С, В, ОР
03	16028252-003	12" x 12" Tan with Brown Mottle Floor Tile Classroom 12	Yes	1	100	ND1	NDI		100	C, B, OP
04	16028252-004	Brown Mastic Associated with 12" x 12" Tan with Brown Mottle Floor Tile Classroom 12	Yes	1	100	NDI	ND1	CELL (2)	98	Т, С, В, ОР
05	16028252-005	9" x 9" Beige with Light Green Streaks Floor Tile Faculty Break Room	Yes	1	100	3	ND1		97	C, B, OP
06	16028252-006	Black Mastic Associated with 9" x 9" Beige with Light Green Steaks Floor Tile Faculty Break Room	Yes	1	100	ND1	ND1	CELL (Trace)	>99	T, B, OP
07	16028252-007	Sample Not Analyzed - Prior Positive								
08	16028252-008	Black Mastic Associated with 9" x 9" Beige with Light Green Steaks Floor Tile Room S14	Yes	I	100	NDI	NDI		100	T, B, OP
09	16028252-009	9" x 9" Tan with Brown, White and Orange Streaks Floor Tile Room S13	Yes	1	100	3	ND1		97	С, В, ОР
10	16028252-010	Black Mastic Associated with 9" x 9" Tan with Brown, White, and Orange Streaks Floor Tile Room S13	Yes	1	100	NDI	ND1		100	T, B, OP

Catter I Pos

Cathleen Piccione Laboratory Analyst

Cathleen Piccione Technical Supervisor

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A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite ND1 = None Detected Trace = Less Than 1%





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QAJVK

NVLAP LAB CODE 200829-0

Certificate of Analysis

08/29/16 Date Collected: 08/30/16 Date Received: 09/09/16 Date Analyzed: Date Reported: 09/09/16 Project ID: 16028252

Applied Environmental

Herndon, VA 20170

Attn:Osman Sharif

200 Fairbrook Dr. Suite 201

Aerobiology

ASSOCIATES,

Expertise Since 1997

Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

LAboratory

INCORPORATED

Test Requested: 3002, Asbestos in Bulk Samples

Client Project Name: Job# 1148-16-0225 Grimm & Parker

Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116 Method:

Sample Id	entification	Client's Physical Description of Sample;	Homo- geneous	Number of	Percent of Sample (%)	Asbestos Chrysotile	Detected Amphibole	Non-Asbestos Fibers	Non-Fibrous Material	Matrix <u>Material</u>
Client	Lab Sample Number		(yes/no)	Layers	Sumple (70)	(%)	(%)	(area %)	(area %)	(composition)
11	16028252-011	Sample Not Analyzed - Prior Positive								
12	16028252-012	Black Mastic Associated with 9" x 9" Tan with Brown, White, and Orange Streaks Floor Tile Stage Side Entrance	Yes	1	100	ND1	NDI		100	T, B, OP
13	16028252-013	9" x 9" Beige with Brown Flecks Floor Tile Classroom 18	Yes	1	100	3	NDI		97	С, В, ОР
14	16028252-014	Black Mastic Associated with 9" x 9" Beige with Brown Flecks Floor Tile Classroom 18	Yes	1	100	ND1	NDI		100	T, B, OP
15	16028252-015	Sample Not Analyzed - Prior Positive								
16	16028252-016	Black Mastic Associated with 9" x 9" Beige with Brown Flecks Floor Tile Health Suite Closet	Yes	1	100	ND1	NDI		100	T, B, OP
17	16028252-017	9" x 9" Light Green with Green Flecks Floor Tile Classroom 20	Yes	1	100	3	NDI		97	С, В, ОР
18	16028252-018	Black Mastic Associated with 9" x 9" Light Green with Green Flecks Classroom 20	Yes	I	100	NDI	ND1		100	Т, В, ОР
19	16028252-019	Sample Not Analyzed - Prior Positive								
20	16028252-020	Black Mastic Associated with 9" x 9" Light Green with Green Flecks Classroom 20	Yes	1	100	NDI	NDI	CELL (Trace)	>99	T, B, OP

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Cathleen Piccione Laboratory Analyst

Catter I Pa Cathleen Piccione

Technical Supervisor

A = Amosite AC = Actinolite AN = Anthophyllite CR = CrocidoliteTR = Tremolite ND1 = None Detected Trace = Less Than 1% CELL = CelluloseQ = Quartz MW = Mineral Wool C = Carbonates FBG = Fiberglass V = Vermiculite SYN = Synthetic G = Gypsum WO = Wollastonite M = Mica NTR = Non-Asbestiform TR T = Tar NAC = Non-Asbestiform AC P = Perlite FT = Fibrous Talc O = Organic AH = Animal Hair B = Binder OP = Opaques D = Diatoms

Certificate of Analysis

<u>MVLAD</u>

NVLAP LAB CODE 200829-0

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Applied Environmental 200 Fairbrook Dr.Suite 201 Hemdon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lausdowne Elementary School, 2301 Alma Road, Baltimore Maryland

Expertise Since 1997

LADORATORY

INCORPORATED

Test Requested: 3002, Asbestos in Bulk Samples

AERODIOLOGY

ASSOCIATES,

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id Client	entification Lab Sample Number	Client's Physical Description of Sample;	Homo- geneous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix <u>Material</u> (composition)
21	16028252-021	12" x 12" Brown with Dark Brown Mottle Floor Tile Library	Yes	1	100	NDI	ND1		100	C, B, OP
22	16028252-022	Brown Mastic Associated with Dark Brown Mottle Floor Tile Library	Yes	1	100	NDI	NDI	CELL (7)	93	C, B, OP
23	16028252-023	12" x 12" Brown with Dark Brown Mottle Floor Tile Computer Room	Yes	1	100	ND1	NDI		100	C, B, OP
24	16028252-024	Brown Mastic Associated with Dark Brown Mottle Floor Tile Computer Room	Yes	1	100	NDI	ND1	CELL (10)	90	C, B, OP
25	16028252-025	12" x 12" Beige with Blue and Brown Specks Floor Tile Classroom K 1	Yes	1	100	NDI	NDI		100	C, B, OP
26	16028252-026	Yellow Mastic Associated with 12" x 12" Beige with Blue and Brown Specks Floor Tile Classroom K 1	Yes	1	100	ND1	NDI	CELL (Trace)	>99	C, B, OP
27	16028252-027	12" x 12" Beige with Blue and Brown Specks Floor Tile Classroom K 1	Yes	1	100	ND1	ND1		100	C, B, OP
28	16028252-028	Yellow Mastic Associated with 12" x 12" Beige with Blue and Brown Specks Floor Tile Classroom K 1	Yes	1	100	NDI	NDI	CELL (Trace)	>99	C, B, OP
29	16028252-029	9" x 9" Olive Green with Green Streaks Floor Tile Guidance Office	Yes	1	100	4	ND1		96	С, В, ОР
30	16028252-030	Black Mastic Associated with 9" x 9" Olive Green with Green Streaks Floor Tile Guidance Office	Yes	1	100	ND1	NDI		100	T, B, OP

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Cathleen Piccione Laboratory Analyst

Page 3 of 14

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Technical Supervisor

A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite ND1 = None Detected Trace = Less Than 1%

CELL = Cellulose Q≃Quartz MW = Mineral Wool C = CarbonatesFBG = Fiberglass V = Vermiculite SYN = Synthetic G = Gypsum WO = Wollastonite M = Mica NTR = Non-Asbestiform TR T = Tar NAC = Non-Asbestiform AC P = PerliteFT = Fibrous Talc O = Organic AH = Animal Hair B = BinderOP = Opaques D = Diatoms



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Certificate of Analysis

Applied Environmental 200 Fairbrook Dr. Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker

3002, Asbestos in Bulk Samples

Aerobiology Associates, Incorporated

Expertise Since 1997

Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

QAIVN NVLAP LAB CODE 200829-0

08/29/16 Date Collected: 08/30/16 Date Received: Date Analyzed: 09/09/16 09/09/16 Date Reported: Project ID: 16028252

Test Requested:

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id	entification	Client's Physical Description of Sample;	Homo- geneous	Number of	Percent of Sample (%)	Asbestos Chrysotile	Detected Amphibole	Non-Asbestos Fibers	Non-Fibrous Material	Matrix Material
Client	Lab Sample Number		(yes/no)	Layers	bumpie (78)	(%)	(%)	(area %)	(area %)	(composition)
31	16028252-031	Sample Not Analyzed - Prior Positive								
32	16028252-032	Black Mastic Associated with 9" x 9" Olive Green with Green Streaks Floor Tile Guidance Office	Yes	1	100	NDI	NDI		100	T, B, OP
33	16028252-033	Black Board Will Sill Faculty Break Room	Yes	1	100	NDI	NDI		100	C, OP
34	16028252-034	Black Board Will Sill Health Suite	Yes	1	100	ND1	NDI		100	C, OP
35	16028252-035	White Seam Mastic on Fiberglass Insulated Duct Foil Corridor Outside Gymnasium Above Suspended Ceiling Tile	Yes	1	100	NDI	NDI	WO (1)	99	C, B, OP
36	16028252-036	White Seam Mastic on Fiberglass Insulated Duct Foil Corridor Outside Gymnasium Above Suspended Ceiling Tile	Yes	1	100	NDI	ND1	WO (1)	99	C, B, OP
37	16028252-037	Brown Seam Mastic on Fiberglass Insulated Duct Foil Corridor Outside Gymnasium Above Suspended Ceiling Tile	Yes	1	100	NDI	NDI		100	C, B, OP
38	16028252-038	Brown Seam Mastic on Fiberglass Insulated Duct Foil Corridor Outside Gymnasium Above Suspended Ceiling Tile	Yes	1	100	NDI	ND1		100	C, B, OP
39	16028252-039	Black Tar (Vapor Barrier) On Exterior Perimeter Wall Classroom 20	Yes	1	100	7	ND1		93	T, B, OP
40	16028252-040	Sample Not Analyzed - Prior Positive								

Catter I Ros

Cathleen Piccione Laboratory Analyst

Catter I Pos

Cathleen Piccione Technical Supervisor A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite ND1 = None Detected Trace = Less Than 1%

CELL = Cellulose Q = QuartzMW = Mineral Wool FBG = Fiberglass SYN = Synthetic WO = Wollastonite NTR = Non-Asbestiform TR NAC = Non-Asbestiform AC FT = Fibrous Talc AH = Animal Hair

C = Carbonates V = Vermiculite G = GypsumM = Mica T = Tar P = Perlite O = Organic B = BinderOP = Opaques D = Diatoms

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Dulles, VA 20166 (877) 648-9150 www.aerobiology.net

Suite 100

43760 Trade Center Place

Applied Environmental 200 Fairbrook Dr. Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

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NVLAD® NVLAP LAB CODE 200829-0
 Date Collected:
 08/29/16

 Date Received:
 08/30/16

 Date Analyzed:
 09/09/16

 Date Reported:
 09/09/16

 Project ID:
 16028252

Test Requested: 3002, Asbestos in Bulk Samples

AERODIOLOGY

ASSOCIATES,

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id	lentification Lab Sample Number	Client's Physical Description of Sample;	Homo- geneous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Detected Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix <u>Material</u> (composition)
41	16028252-041	Sample Not Analzyed - Prior Positive								
42	16028252-042	Sample Not Analzyed - Prior Positive								
43	16028252-043	Sample Not Analzyed - Prior Positive								
44	16028252-044	Sample Not Analzyed - Prior Positive								
45	16028252-045	Sample Not Analzyed - Prior Positive								
46	16028252-046	Gray Seam Mastic on Metal Ducting System Boys Restroom	Yes	1	100	NDI	ND1		100	C, B, OP
47	16028252-047	Gray Seam Mastic on Metal Ducting System Girls Restroom	Yes	I	100	ND1	NDI		100	C, B, OP
48	16028252-048	2' x 4' White with Worm Like Gouges and Pinholes Ceiling Tile Classroom 14	Yes	1	100	ND1	ND1	CELL (25) MW (50)	25	P, C, OP
49	16028252-049	2' x 4' White with Worm Like Gouges and Pinholes Ceiling Tile Classroom 20	Yes	I	100	NDI	NDI	CELL (30) MW (50)	20	P, C, OP
50	16028252-050	2' x 4' White with Fissures and Pinholes Ceiling Tile Classroom K 1	Yes	1	100	ND1	ND1	CELL (35) MW (45)	20	P, C, OP

Catter & Ros

Cathleen Piccione Laboratory Analyst

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Cathleen Piccione Technical Supervisor A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite NDI = None Detected Trace = Less Than 1%



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Applied Environmental 200 Fairbrook Dr.Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

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ASSOCIATES,

Test Requested: 3002, Asbestos in Bulk Samples

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id	entification	Client's Physical Description of Sample;	Homo-	Number of	Percent of	Asbestos Chrysotile	Detected Amphibole	Non-Asbestos Fibers	Non-Fibrous Material	Matrix Material
Client	Lab Sample Number		(yes/no)	Layers	Sample (%)	(%)	(%)	(area %)	(area %)	(composition)
51	16028252-051	2' x 4' White with Fissures and Pinholes Ceiling Tile Classroom K 1	Yes	1	100	NDI	NDI	CELL (35) MW (45)	20	P, C, OP
52	16028252-052	2' x 4' White Smooth Surface (Drywall) Ceiling Tile Boys Restroom	Yes	1	100	NDI	NDI	CELL (15) FBG (2)	83	C, OP, G
53	16028252-053	2' x 4' White Smooth Surface (Drywall) Ceiling Tile Girls Restroom	Yes	1	100	NDI	ND1	CELL (15) FBG (2)	83	C, OP, G
54	16028252-054	2' x 4' White with Decorative Gouges and Pinholes Ceiling Tile Corridor Outside Faculty Breakroom	Yes	1	100	NDI	NDI	CELL (40) MW (25)	35	P, C, OP
55	16028252-055	2' x 4' White with Decorative Gouges and Pinholes Ceiling Tile Corridor Outside Classroom 12	Yes	1	100	ND1	NDI	CELL (40) MW (25)	35	P, C, OP
56	16028252-056	Blue Woven Fire Curtain Cafeteria Stage	Yes	1	100	NDI	NDI	SYN (80)	20	C, B, OP
57	16028252-057	Gray Interior Window Caulk Faculty Breakroom	Yes	I	100	ND1	NDI		100	C, B, OP
58	16028252-058	Gray Interior Window Caulk Cafeteria	Yes	1	100	NDI	ND1		100	C, B, OP
59	16028252-059	4' x 4' White with Fissures and Pinholes Wall Tile Classroom 16	Yes	1	100	NDI	NDI	CELL (30) MW (50)	20	P, C, OP
60	16028252-060	4' x 4' White with Fissures and Pinholes Wall Tile Classroom 16	Yes	1	100	ND1	ND1	CELL (30) MW (50)	20	P, C, OP

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Cathleen Piccione

Technical Supervisor

Catter & Res

Cathleen Piccione Laboratory Analyst

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A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite ND1 = None Detected Trace = Less Than 1% CELL = CelluloseQ = QuartzMW = Mineral Wool C = Carbonates FBG = Fiberglass V = Vermiculite SYN = Synthetic G = Gypsum WO = Wollastonite M = Mica NTR = Non-Asbestiform TR T == Tar NAC = Non-Asbestiform AC P = PerliteFT = Fibrous Tale O = Organic AH = Animal Hair B = BinderOP ≈ Opaques D = Diatoms

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Applied Environmental 200 Fairbrook Dr.Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

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3002, Ashestos in Bulk Samples Test Requested:

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ASSOCIATES,

Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116 Method:

Sample Id	entification	Client's Physical Description of Sample:	Homo-	Number of	Percent of	Asbestos Chrysotile	Detected Amphibole	Non-Asbestos Fibers	Non-Fibrous Material	Matrix Material
Client	Lab Sample Number	F	(yes/no)	Layers	Sample (%)	(%)	(%)	(area %)	(area %)	(composition)
61	16028252-061	Brown Mastic Associated with 4' x 4' White with Fissures and Pinholes Wall Tile Classroom 16	Yes	1	100	ND1	NDI	CELL (Trace)	>99	С, В, ОР
62	16028252-062	Brown Mastic Associated with 4' x 4' White with Fissures and Pinholes Wall Tile Classroom 16	Yes	1	100	NDI	ND1		100	C, B, OP
63	16028252-063	2' x 4' White Smooth Surface (Drywall) Ceiling Tile Kitchen Serving Area	Yes	1	100	ND1	NDI	CELL (15) FBG (2)	83	C, OP, G
64	16028252-064	Brown Ceiling Deck Panel Stage Storage/AHU Room	Yes	1	100	NDI	ND1	CELL (15)	85	C, OP, G
65	16028252-065	Brown Ceiling Deck Panel Classroom 18	Yes	1	100	ND1	NDI	CELL (15)	85	C, OP, G
66	16028252-066	Brown Ceiling Deck Panel Classroom 8	Yes	1	100	NDI	ND1	CELL (15)	85	C, OP, G
67	16028252-067	Multi-Color Terrazzo Flooring Corridor Outside Classroom 15 Near Exit Door	Yes	1	100	ND1	NDI		100	Q, C, B, OP
68	16028252-068	Multi-Color Terrazzo Flooring Custodial Closet	Yes	1	100	NDI	NDI		100	Q, C, B, OP
69	16028252-069	Black Chalkboard Mastic Classroom 10	Yes	1	100	3	ND1		97	T, B, OP
70	16028252-070	Sample Not Analyzed - Prior Positive								

Catter & Res

Cathleen Piccione Laboratory Analyst

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Cathleen Piccione

Technical Supervisor

A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite ND1 = None Detected Trace = Less Than 1%

CELL = Cellulose MW = Mineral Wool FBG = Fiberglass SYN = Synthetic WO = Wollastonite NTR = Non-Asbestiform TR NAC = Non-Asbestiform AC FT = Fibrous Talc AH = Animal Hair

V = Vermiculite G == Gypsum M = Mica T = Tar $\mathbf{P} = \mathbf{Perlite}$ O = Organic B = Binder OP = Opaques D = Diatoms

Q = Quartz

 $\hat{C} = \hat{C}$ arbonates

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Applied Environmental 200 Fairbrook Dr.Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

Expertise Since 1997

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Test Requested: 3002, Asbestos in Bulk Samples

Aerobiology

ASSOCIATES,

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id Client	entification Lab Sample Number	Client's Physical Description of Sample;	Homo- geneous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Detected Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix <u>Material</u> (composition)
71	16028252-071	White Sink Caulk Women's Faculty Restoom	Yes	1	100	NDI	ND1		100	C, B, OP
72	16028252-072	White Sink Caulk Men's Faculty Restroom	Yes	1	100	NDI	NDI		100	C, B, OP
73	16028252-073	Gray Exterior Window Caulk Clasroom 18 Exterior	Yes	1	100	NDI	ND1		100	C, B, OP
74	16028252-074	Gray Exterior Window Caulk S 14 Exterior	Yes	1	100	ND1	NDI		100	C, B, OP
75	16028252-075	Gypsum Wall Board with Joint Compound on Skylight Corridor Outside Classroom 18	No	2	100	ND1	NDI	CELL (30)	70	C, OP, M
76	16028252-076	Gypsum Wall Board with Joint Compound on Skylight Corridor Outside S 8	No	2	100	ND1	NDI	CELL (30)	70	C, OP, M
77	16028252-077	Gypsum Wall Board with Joint Compound on Skylight Corridor Outside Classroom 11	No	2	100	NDI	ND1	CELL (20)	80	C, OP, G, M
78	16028252-078	Gray Powdery Mudded Joint on Fiberglass Insulated Pipe Clasroom 4 Pipe Chase Near Side Exit	Yes	1	100	4	NDI	MW (45)	51	C, OP , G
79	16028252-079	Gray Exterior Door Caulk Cafeteria	Yes	1	100	ND1	NDI		100	C, B, OP
80	16028252-080	Gray Exterior Door Caulk S 14	Yes	1	100	NDI	ND1		100	C, B, OP

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Cathleen Piccione Laboratory Analyst

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Cathleen Piccione Technical Supervisor

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CELL = Cellulose	O = Ouartz
MW = Mineral Wool	C = Carbonates
FBG = Fiberglass	V = Vermiculite
SYN = Synthetic	G = Gypsum
WO = Wollastonite	M = Mica
NTR = Non-Asbestiform TR	T = Tar
NAC = Non-Asbestiform AC	P = Perlite
FT = Fibrous Talc	O == Organic
AH = Animal Hair	B = Binder
	OP = Opaques
	D = Diatoms

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Applied Environmental 200 Fairbrook Dr.Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

Expertise Since 1997

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INCORPORATED

Test Requested: 3002, Asbestos in Bulk Samples

AERODIOLOGY

ASSOCIATES,

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id Client	entification Lab Sample Number	Client's Physical Description of Sample;	Homo- gencous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Detected Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix Material (composition)
81	16028252-081	Gray Exterior Door Caulk Cafeteria	Yes	1	100	ND1	NDI		100	C, B, OP
82	16028252-082	Gray Exterior Door Caulk Classroom 16	Yes	1	100	NDI	ND1		100	C, B, OP
83	16028252-083	White Interior Door Caulk S 14	Yes	1	100	NDI	ND1	CELL (Trace) FT (Trace)	>99	C, B, OP
84	16028252-084	White Interior Door Caulk Classroom 16	Yes	1	100	ND1	NDI		100	C, B, OP
85	16028252-085	White Interior Door Caulk Cafeteria	Yes	1	100	NDI	NDI	FT (Trace)	>99	C, B, OP
86	16028252-086	Two-coat Textured Ceiling Plaster Equipment Room	Yes	1	100	ND1	NDI		100	Q, C, OP, G
87	16028252-087	Two-coat Textured Ceiling Plaster Equipment Room	Yes	1	100	ND1	NDI		100	Q, C, OP, G
88	16028252-088	Two-coat Textured Ceiling Plaster Equipment Room	Yes	1	100	NDI	NDI		100	Q, C, OP, G
89	16028252-089	Gypsum Ceiling Board with Joint Compound Equipment Room	No	2	100	NDI	NDI	CELL (18)	82	P, C, OP, G, M
90	16028252-090	Gypsum Ceiling Board with Joint Compound Equipment Room	No	2	100	NDI	NDI	CELL (23)	77	P, C, OP, G, M

Catter I Pos

Cathleen Piccione Laboratory Analyst

Cathleen Piccione **Technical Supervisor** A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = TremoliteND1 = None Detected Trace = Less Than 1%



Date Collected: 08/29/16 Date Received: 08/30/16 09/09/16 Date Analyzed: Date Reported: 09/09/16 16028252 Project ID:

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Applied Environmental 200 Fairbrook Dr.Suite 201 Hemdon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker

Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

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 Project ID:
 16028252

Test Requested: 3002, Asbestos in Bulk Samples

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Identification Client Lab Sample Number		Client's Physical Description of Sample;	Homo- geneous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Detected Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix <u>Material</u> (composition)
91	16028252-091	Two-coat Wall Plaster Classroom K1	Yes	I	100	ND1	NDI		100	C, OP, M
92	16028252-092	Two-coat Wall Plaster Classroom 20 Above Side Exit Door	Yes	1	100	ND1	NDI		100	C, OP, G
93	16028252-093	Two-coat Wall Plaster Classroom 12	Yes	1	100	NDI	ND1		100	C, OP, G
	16028252-094	Two-coat Ceiling Plaster C2 Painted White Plaster	Yes	1	50	NDI	NDI		100	C, OP, G
94	16028252-094	Two-coat Ceiling Plaster C2 Beige Plaster	Yes	1	50	ND1	NDI		100	P, C, OP, G
	16028252-095	Two-coat Ceiling Plaster C4 Painted White Plaster	Yes	1	20	ND1	NDI		100	C, OP, G
66	16028252-095	Two-coat Ceiling Plaster C4 Beige Plaster	Yes	1	80	NDI	NDI		100	P, C, OP, G
06	16028252-096	Two-coat Ceiling Plaster Recreation Storage Painted White Plaster	Yes	1	80	NDI	ND1		100	C, OP, G
<u></u>	16028252-096	Two-coat Ceiling Plaster Recreation Storage Beige Plaster	Yes	1	20	ND1	NDI		100	P, C, OP, G
97	16028252-097	Gypsum Wall Board with Joint Compound Classroom 20 Above Side Exit Door	No	2	100	NDI	ND1	CELL (1)	99	C, OP, G, M

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Cathleen Piccione Laboratory Analyst

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Cathleen Piccione Technical Supervisor

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3002, Ashestos in Bulk Samples Test Requested:

Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116 Method:

Sample Id Client	entification Lab Sample Number	Client's Physical Description of Sample;	Homo- geneous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Detected Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix <u>Material</u> (composition)
98	16028252-098	Gypsum Wall Board with Joint Compound Classroom 4 Above Side Exit Door	No	2	100	ND1	NDI	CELL (2)	98	C, OP, G, M
99	16028252-099	Gypsum Wall Board with Joint Compound SI1	No	2	100	NDI	ND1	CELL (30)	70	P, C, OP, M
	16028252-100	Asphalt Roofing Tar with Pea Gravel (Top Layer) Roof Black Tar with Stones	Yes	1	65	NDI	NDI	CELL (Trace)	>99	Q, T, C, B, OP
100	16028252-100	Asphalt Roofing Tar with Pea Gravel (Top Layer) Roof Black Tarry Semi-Fibrous Material	Yes	1	35	NDI	ND1	FBG (30)	70	Т, В, ОР
16028252-101		Asphalt Roofing Tar with Pea Gravel (Top Layer) Roof Black Tar with Stones	Yes	1	50	NDI	NDI			Q, T, C, B, OP
101	16028252-101	Asphalt Roofing Tar with Pea Gravel (Top Layer) Roof Black Tarry Semi-Fibrous Material	Yes	1	35	NDI	NDI	FBG (30)	70	Т, В, ОР
	16028252-101	Asphalt Roofing Tar with Pea Gravel (Top Layer) Roof Brown Fibrous Material	Yes	1	15	NDI	ND1	CELL (75)	25	P, OP
102	16028252-102	Roof Insulation with Black Felt (Mid Layer) Roof Brown Fibrous Material	Yes	1	90	ND1	NDI	CELL (75)	25	P, OP
102	16028252-102	Roof Insulation with Black Felt (Mid Layer) Roof Black Fibrous Material	Yes	1	10	ND1	ND1	CELL (70) FBG (15)	15	B, OP

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Cathleen Piccione Laboratory Analyst

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Technical Supervisor

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Cathleen Piccione

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08/29/16 Date Collected: 08/30/16 Date Received: Date Analyzed: 09/09/16 Date Reported: 09/09/16 Project ID: 16028252



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Applied Environmental 200 Fairbrook Dr.Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

3002, Asbestos in Bulk Samples Test Requested;

Aerobiology

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Identification		Client's Physical Description of Sample;	Homo- geneous	Number of	Percent of Sample (%)	Asbestos Chrysotile	Detected Amphibole	Non-Asbestos Fibers	Non-Fibrous Material	Matrix Material
Chem	Lao Sample Number	Roof Insulation with Black Felt (Mid Layer)	(yes/10)	Takels			(76)	(aica /6)	(diça 70)	(composition)
]	16028252-103	Roof	Yes	1	30	NDI	ND1	FBG (25)	75	T, B, OP
102		Black Semi-Fibrous Tarry Material						CELL (Trace)		
105		Roof Insulation with Black Felt (Mid Layer)								
	16028252-103	Roof	Yes	1	70	ND1	NDI	CELL (75)	25	P, OP
		Brown Fibrous Material								
		Asphalt Roofing Tar (Bottom Layer)								
	16028252-104	Roof	Yes	1	10	ND1	ND1	CELL (70)	20	B, OP
104		Black Fibrous Material						FBG (10)		
		Asphalt Roofing Tar (Bottom Layer)								
1	16028252-104	Roof	Yes		90	NDI	ND1	FBG (30)	65	Т, В, ОР
i		Black Semi-Fibrous Tar						CELL (5)		
		Asphalt Roofing Tar (Boltom Layer)	V		10	101			07	
	16028252-105	Koot	Yes		75	NDI	NDI	FBG (3)	97	Q, 1, C, B, OP
105		Black I ar with Stones	··· ·· ·			· · ·		CELL (Trace)		
	16029252 105	Aspnaa Rooning Tar (Bortom Layer)	Vac	Ι,	26	ATTAL	NTN	CELL (65)	35	TROP
	10028232-103	R001 Black Filesun Matarial	ICS		23	NDI	NDI	CELL (65)	33	1, B, OF
		Black Fibrous Material								
106	16028252-106	Gray Martin on Fiberalass Insulated Duct Foil	Vac	1	100	NDI		FBG (20)	80	CBOP
100	10028232-100	Roof	105	· ·	100	NDI	ND1	1130 (20)	80	C, B, OF
		1001								
107	16028252-107	Grav Mastic on Fiberglass Insulated Duct Foil	Yes	1	100	NDI	NDI	FBG (20)	80	C B OP
10,	10020202 107	Roof						120(20)	00	0, 2, 01
						· · ·		······		
108	16028252-108	Gray Mastic on Fiberglass Insulated Duct Foil	Yes	1	100	ND1	NDI	FBG (20)	80	C, B, OP
		Roof								
109	16028252-109 Black Stair Tread		Yes	1	100	ND1	NDI		100	Q, C, B, OP
		Ladder to Gymnasium Roof								

Catter / Res

Cathleen Piccione Laboratory Analyst

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Catter 1 Pm

Cathleen Piccione **Technical Supervisor**

43760 Trade Center Place, Suite 100, Dulles, VA 20166 (877) 648-9150

A = AmositeAC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite ND1 = None Detected Trace = Less Than 1%

CELL = Cellulose Q ⇒ Quartz MW = Mineral Wool $\hat{C} = \hat{C}arbonates$ FBG = Fiberglass V = Vermiculite SYN = Synthetic WO = Wollastonite NTR = Non-Asbestiform TR NAC = Non-Asbestiform AC FT = Fibrous Talc AH = Animal Hair

G = Gypsum M = Mica T = Tar $\mathbf{P} = \mathbf{Perlite}$ O = Organic B = Binder OP = Opaques D = Diatoms

Date Collected: 08/29/16 Date Received: 08/30/16 09/09/16 Date Analyzed: Date Reported: 09/09/16 16028252 Project ID:

ASSOCIATES, Expertise Since 1997

NVLAD

NVLAP LAB CODE 200829-0

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ASSOCIATES, MICORPORATED Expertise Since 1997

LAboratory

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Certificate of Analysis

QAIVN

NVLAP LAB CODE 200829-0

 Date Collected:
 08/29/16

 Date Received:
 08/30/16

 Date Analyzed:
 09/09/16

 Date Reported:
 09/09/16

 Project ID:
 16028252

Applied Environmental 200 Fairbrook Dr.Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

Test Requested: 3002, Asbestos in Bulk Samples

Aerobiology

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id Client	Lab Sample Number		Homo- geneous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Detected Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix <u>Material</u> (composition)
110	16028252-110	Black Stair Tread Ladder to Cafeteria Roof	Yes	1	100	ND1	ND1		100	Q, C, B, OP
111	16028252-111	Gray Flashing on Vent Roof	Yes	1	100	NDI	NDI	CELL (25)	75	T, C, B, OP
112	16028252-112	Gray Flashing on Vent Roof	Yes	1	100	ND1	ND1	CELL (Trace)	>99	Т, В, ОР
113	16028252-113	Roof Shingle on Vent Roof	Yes	1	100	NDI	NDI	SYN (10) FBG (Trace)	90	Q, T, C, B, OP
114	16028252-114	Roof Sbingle on Vent Roof	Yes	1	100	ND1	NDI	SYN (20)	80	Q, T, C, B, OP
115	16028252-115	Black Flashing on Perimeter Roof	Yes	1	100	NDI	ND1		100	T, B, OP
116	16028252-116	Black Flashing on Perimeter Roof	Yes	1	100	ND1	NDI	CELL (Trace)	>99	T, B, OP
117	16028252-117	Roof Shingle on Perimeter Roof	Yes	1	100	NDI	ND1	SYN (35)	65	Q, T, C, B, OP
118	16028252-118	Roof Shingle on Perimeter Roof	Yes	1	100	NDI	NDI	SYN (35)	65	Q, T, C, B, OP
119	16028252-119	Gray Exterior Window Caulk Gymnasium Window on Roof	Yes	1	100	NDI	NDI		100	C, B, OP

Catter I Pas

Cathleen Piccione

Technical Supervisor

Catter I Pas

Cathleen Piccione Laboratory Analyst

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A = Amosite AC = Actinolite AN = Anthophyllite CR = Crocidolite TR = Tremolite ND1 = None Detected Trace = Less Than 1%



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NVLAP LAB CODE 200829-0

Date Collected:	08/29/16
Date Received:	08/30/16
Date Analyzed:	09/09/16
Date Reported:	09/09/16
Project ID:	16028252

Applied Environmental 200 Fairbrook Dr. Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland

Expertise Since 1997

Test Requested: 3002, Asbestos in Bulk Samples

Aerobiology

ASSOCIATES,

Method: Polarized Light Microscopy (PLM), Interim Method for Asbestos in Bulk Insulation; EPA 600/M4-82-020. Methos for Asbestos in Bulk Building Material: EPA 600/R-93/116

Sample Id Client	entification Lab Sample Number	Client's Physical Description of Sample;	Homo- geneous (yes/no)	Number of Layers	Percent of Sample (%)	Asbestos Chrysotile (%)	Detected Amphibole (%)	Non-Asbestos <u>Fibers</u> (area %)	Non-Fibrous <u>Material</u> (area %)	Matrix <u>Material</u> (composition)
120	16028252-120	Gray Exterior Window Caulk Gymnasium Window on Roof	Yes	1	100	NDI	ND1		100	C, B, OP
121	16028252-121	Blue Woven Fire Curtain Cafeteria Stage	Yes	1	100	NDI	NDI	SYN (85)	15	C,B, OP
	-								· · · · ·	

Catter I Ro

Cathleen Piccione Laboratory Analyst

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Cathe I Res

Cathleen Piccione Technical Supervisor A = Amosite AC = Actinolite AN = Anthophyllite CR = Crociolite TR = Tremolite ND1 = None Detected Trace = Less Than 1%

CELL = Cellulose Q = Quartz MW = Mineral Wool $\vec{C} = Carbonates$ FBG = Fiberglass V = Vermiculite SYN = Synthetic G = Gypsum WO = Wollastonite M = Mica NTR = Non-Asbestiform TR T = TarNAC = Non-Asbestiform AC P = PerliteFT = Fibrous Talc O = Organic AH = Animal Hair B = Binder OP = Opaques D = Diatoms

AERObiology Laboratory ASSOCIATES, INCORPORATED Expertise Since 1997	Certificate of Analysis	43760 Trade Center Place Suite 100 Dulles, VA 20166 (877) 648-9150 www.aerobiology.net
Applied Environmental 200 Fairbrook Dr.Suite 201 Herndon, VA 20170 Attn:Osman Sharif Client Project Name: Job# 1148-16-0225 Grimm & Parker Client Project Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore Maryland	NVLAP LAB CODE 200829-0	Date Collected: 08/29/16 Date Received: 08/30/16 Date Analyzed: 09/09/16 Date Reported: 09/09/16 Project ID: 16028252

General Notes

- ND1 indicates no asbestos was detected; the method detection limit is 1%.
- Trace or "<1" indicates asbestos was identified in the sample, but the concentration is less than the method detection limit of 1%.

• All regulated asbestos minerals (i.e. chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite) were sought in every layer of each sample, but only those asbestos minerals detected are listed. Amosite is the common name for the asbestiform variety of the mineral rebeckite.

• Tile, vinyl, foam, plastic, and fine powder samples may contain asbestos fibers of such small diameter (< 0.25 microns in diameter) that these fibers cannot be detected by PLM. For such samples, more sensitive analytical methods (e.g. TEM, SEM, and XRD) are recommended if greater certainty about asbestos content is required. Semi-quantitative bulk TEM floor tile analysis is accepted under the NESHAPS regulations.

• Samples identified as inhomogeneous (containing more that one layer) shall be divided into individual layers and each layer tested separately. The results for each individual layer shall be listed separately on the report.

• These results are submitted pursuant to Aerobiology's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted.

• Unless notified in writing to return the samples covered by this report, Aerobiology Laboratory will store the samples for a minimum period of 3 months before discarding. A shipping and handling charge will be assessed for the return of any samples.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- This test report relates only to the items tested or calibrated.
- This report is not valid unless it bears the name of a NVLAP-approved signatory.
- Any reproduction of this document must include the entire document in order for the report to be valid.

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AEI Project #_

1148-16-0225

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1602-8252 PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

Page 1 of 12

Client/Mailin	g/Billing I	nformation											
Client Name:	GRIM	M & PARKER		Client Address:	11720	Beltsville I	Drive, Sui	te 600, Ca	lverton, N	laryland 2	0705		
Phone #:	301-59	5-1000	Cell #:		Fax #:				Em	ail:			
Job Informat	tion												
Job #: 1148	-16-0225	Job Name:	GRIMM	& PARKER	Job Lo	cation:	Lansdown	ne Elemen	tary Scho	ol, 2301 Al	<u>ma Road, Balti</u>	<u>more, Mar</u>	<u>yland</u>
Building Code	e #:		_ Phone #:			_Cell #:				Fax #:			
Turn Around	Time Nee	ded Date Required	d:/	_ , 🗆 Immediate	🗆 Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	🗑 5 Day+	□After Hours* (*must be pro	-scheduled)
Analysis PLM	Bulk EP/	A 600 Visual Estimate	c 121 (QTY) Pos. Stop(Y)N	EPA Point C	Count	_(QTY) C	Vacuum V	Vipe (Quali	tative)	(QTY) 🛛 Part	icle ID	(QTY)

Comments: Please report the results to osharif@appenv.com and Call for any questions 571-238-7784.

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
A	FTI	01		12" x 12" tan with brown mottle floor tile	Classroom 2	
В	FM1	02		Brown mastic associated with 12" x 12" tan with brown mottle floor tile	Classroom 2	
А	ान	03		12" x 12" tan with brown mottle floor tile	Classroom 12	
В	FM1	04		Brown mastic associated with 12" x 12" tan with brown mottle floor tile	Classroom 12	
С	FT2	05		9" x 9" beige with light green streaks floor tile	Faculty break room	
D	FM2	06		Black mastic associated with 9" x 9" beige with light green streaks floor tile	Faculty break room	
c	FT2	07		9" x 9" beige with light green streaks floor tile	Room S14	
D	FM2	08		Black mastic associated with 9" x 9" beige with light green streaks floor tile	Room S14	
E	FT3	00		9" x 9" tan with brown, white, and orange streaks floor tile	Room S13	
F	FM3	10		Black mastic associated with 9" x 9" tan with brown, white, and orange streaks floor tile	Room S13	

Sampled by	(Name) Gary Lewis	(Signature)	Fight for Gary Lewis	(Date/Tune) August 29, 2016	Lab Tracking #
Received by:	Name) EM	(Signature)	001	(Date/Time) 8/30/16	
Analyzed by:	Name)	(Signature)		(Date/Tune)	

-



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1148-16-0225

PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY Page 2 of 12

16028252

Chent/Mailing	Billing Information										
Client Name:	GRIMM & PARK	ER	Client Address:	11720	Beltsville D	rive, Suit	te 600, Ca	lverton, N	laryland 2	20705	
Phone #:	301-595-1000	Cell #:		Fax #:				Em	ail:		
Job Informatio	n										
Job #: 1148-1	6-0225 Job Name:	GRIMM	& PARKER	Job Lo	cation:	ansdowr	ne Elemen	tary Scho	ol, 2301 Al	ma Road, Baltimore, N	laryland
Building Code #	#:	Phone #:			Cell #:				Fax #:		
Turn Around 1	Time Needed Date Re	quired: /	/ 🗆 Immediate	Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	関 5 Day+	□After Hours* (*must b	e pre-scheduled
Analysis <u>PLM E</u>	Bulk EPA 600 Visual E	stimate 121 (QTY) Pos. Stop	EPA Point C	ount	(OTY) [Vacuum W	/ipe (Qualit	ative)	(QTY)	(QTY)

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
E	F73	11		9" x 9" tan with brown, white, and orange streaks floor tile	Stage side entrance	
F	FM3	12		Black mastic associated with 9" x 9" tan with brown, white, and orange streaks floor tile	Stage side entrance	
G	FT4	13		9" x 9" beige with brown flecks floor tile	Classroom 18	
н	FM4	14		Black mastic associated with 9" x 9" heige with brown flecks floor tile	Classroom 18	
G	FT4	15		9" x 9" beige with brown flecks floor tile	Health suite closet	
Н	FM4	16		Black mastic associated with 9" x 9" beige with brown flecks floor tile	Health suite closet	
i	FT5	17		9" x 9" light green with green flecks floor tile	Classroom 20	
J	FM5	18		Black mastic associated with 9" x 9" light green with green flecks floor tile	Classroom 20	
I	FT5	19		9" x 9" light green with green flecks floor tile	Classroom 20	
J	FM5	20		Black mastic associated with 9" x 9" light green with green flecks floor tile	Classroom 20	

			Df1			
Sampled by	(Name) Gary Lewis	(Signature)	The I for Gary Lewis	(Date/Time)	August 29, 2016	Lab Tracking #
Received by:	Name) 277	(Signature)		_(Date/Tune)	\$ 30/16	
Analyzed by:	Naine}	(Signature)		(Date/Time)		



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1148-16-0225

PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

16023252

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Client/Mailing/	Billing Information										
Client Name:	GRIMM & PARK	ER Clie	nt Address:	<u>11720 E</u>	<u>Beltsville I</u>	Drive, Suit	te 600, Ca	lverton, N	laryland 2	10705	
Phone #:	301-595-1000	Cell #:		Fax #:				Em:	ail:		
Job Information	1.										
Job #: 1148-10	5-0225 Job Name:	GRIMM & P	ARKER	Job Lo	cation:	Lansdowr	<u>ie Elemen</u>	tary Scho	ol, 2301 Al	ma Road, Baltimor	e, Maryland
Building Code #	*	Phone #:			_Cell #:				Fax #:		
Turn Around T	ime Needed Date Re	quired://	🗆 Immediate	□ Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	🛙 5 Day+	□After Hours* (*mu	st be pre-scheduled)
Analysis PLM B	ulk 🖿 EPA 600 Visual E	stimate 121 (QTY) Pos. Stop(Y)N	D EPA Point C	ouni	(QTY) 🗆	Vacuum V	Vipe (Qualit	ative)	(QTY) 🗆 Particle l	D(QTY)

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
К	FT6	21		12" x 12" brown with dark brown mottle floor tile	Library	
L	FM6	22		Brown mastic associated with 12" x 12" brown with dark brown mottle floor tile	Library	
к	FT6	23		12" x 12" brown with dark brown mottle floor tile	Computer room	
L	FM6	24		Brown mastic associated with 12" x 12" brown with dark brown mottle floor tile	Computer room	
м	FT7	25		12" x 12" beige with blue and brown specks floor tile	Classroom K1	
N	FM7	26		Yellow mastic associated with 12" x 12" beige with blue and brown specks floor tile	Classroom K1	
м	717	27		12" x 12" beige with blue and brown specks floor tile	Classroom K1	
N	FM7	28		Yellow mastic associated with 12" x 12" beige with blue and brown specks floor tile	Classroom K1	
0	FT8	29		9" x 9" olive green with green streaks floor tile	Guidance Office	
P	FM8	30		Black mastic associated with 9" x 9" olive green with green streaks floor tile	Guidance Office	

Sampled by	(Name) Gary Lewis	_(Signature)	(Date/Time) August 29, 2016 Lah Tracking #
Received by:	Name)	(Signature)	(Date/Time)3/30//6
Analyzed by	Nume)	(Signature)	(Date/Time)



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1148-16-0225

PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

Page 4 of 12

Client/Mailing/Billing Information GRIMM & PARKER Client Name: Client Address: 11720 Beltsville Drive, Suite 600, Calverton, Marvland 20705 Phone #: 301-595-1000 Cell #: Fax #: Email: **Job Information** Job #: 1148-16-0225 Job Name: Job Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore, Maryland **GRIMM & PARKER** Building Code #: Phone #: Cell #: Fax #: Turn Around Time Needed Date Required: / / Immediate 🗆 Same Day 🗆 24 hr 🗆 2 Day 🗇 3 Day 🗇 4 Day 🗃 5 Day+ 🗔 After Hours* (*must be pre-scheduled) Analysis PLM Bulk EPA 600 Visual Estimate 121 (QTY) Pos. Stop(Y) EPA Point Count (QTY) Vacuum Wipe (Qualitative) (QTY) Particle ID (QTY)

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
0	FT8	31		9" x 9" olive green with green streaks floor tile	Guidance Office	
ŋ	FM8	32		Black mastic associated with 9" x 9" olive green with green streaks floor tile	Guidance Office	
Q	WSI	33		Black board will sill	Faculty break room	
Q	WSI	34		Black board will sill	Health Suite	
R	SMI	35		White seam mastic on fiberglass insulated duct foil	Corridor outside gymnasium above suspended ceiling tile	
R	SMI	36		White seam mastic on fiberglass insulated duct foil	Corridor outside gymnasium above suspended ceiling tile	
S	SM2	37		Brown seam mastic on fiberglass insulated duct foil	Corridor outside gymnasium above suspended ceiling tile	
S	SM2	38		Brown seam mastic on fiberglass insulated duct foil	Corridor outside gymnasium above suspended ceiling tile	
Т	VB1	39		Black tar (vapor barrier) on exterior perimeter wall	Classroom 20	
Т	VBI	40		Black tar (vapor barrier) on exterior perimeter wall	Classroom K1	

Sampled by:	(Name) Gary Lewis	(Signature)	my hant for Gary Lewis	_ (Date/Time)	August 29, 2016	Lab Tracking #
Received by:	Name) <u>eM</u>	(Signature)		_(Datc/Time)	8/30/16	
Analyzed by:	Name)	(Signature)		(Date/Time)		



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1148-16-0225

PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

16025252

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Client/Mailing/	Client/Mailing/Billing Information													
Client Name:	GRIMA	M & PARKER		Client Add	ess:	11720	Beltsville	Drive, Sui	te 600, Ca	lverton, N	<u>1aryland</u> 2	20705		
Phone #:	301-595	-1000	_Cell #:			Fax #:				Em	ail:			
Job Informatio	n													
Job #: 1148-10	6-0225	_ Job Name:	GRIMM	& PARKE	R	Job Lo	ocation:	Lansdow	ne Elemen	tary Scho	ol, 2301 Al	<u>ma Road, Balti</u>	<u>more, Mary</u>	and
Building Code #	:		_ Phone #:			· · · · · · · · · · · · · · · · · · ·	Cell #:				Fax #:			-
Turn Around T	ime Need	led Date Required	d: /	_/ 🗆 lm	mediate	Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	🖬 5 Day+	□After Hours* (*must be pre-s	cheduled)
Analysis PLM B	<u>ulk</u> 🖬 EPA	600 Visual Estimate	: <u>121 (</u>	(QTY) Pos. S	top(Y)N	EPA Point C	Count	_(QTY) E	J Vacuum V	Vipe (Qualit	ative)	(QTY) 🗆 Parti	cle ID	(QTY)

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
т	VBI	41		Black tar (vapor barrier) on exterior perimeter wall	Classroom 18	
I.	VBI	42		Black tar (vapor barrier) on exterior perimeter wall	Classroom 12	
Т	VB1	43		Black tar (vapor barrier) on exterior perimeter wall	Classroom 14	
T	VBI	44		Black tar (vapor barrier) on exterior perimeter walt	Corridor outside classroom 7 above exit door	
т	VBI	45		Black tar (vapor barrier) on exterior perimeter wall	Classroom 3	
U	SM3	46		Gray seam mastic on metal ducting system	Boys restroom	
Ų	SM3	47		Gray seam mastic on metal ducting system	Girls restroom	
v	сті	48		2' x 4' white with worm like gouges and pinholes ceiling tile	Classroom 14	
v	СТІ	49		2' x 4' white with worm like gouges and pinholes ceiling tile	Classroom 20	
х	CT2	50		2' x 4' white with fissures and pinholes ceiling tile	Classroom K1	

	Constanti		Aft		6 L 100 - 10 T - 47
Sampled by.	(Name) Gary Lewis	(Signature)	man han / for Gary Lewis	(Date/Time) August 29, 2015	Lab Tracking #
Received by:	Name) EM	(Signature)		(Date/Time) 5/30/16	
Analyzed by:	Name)	(Signature)		(Date/1 me)	



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AEI	Pro	ject	#
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PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

16628252

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Client/Mailing	y/Billing Ir	formation											
Client Name:	GRIM	M & PARKER		Client Address:	11720]	Beltsville	Drive, Sui	<u>te 600, Ca</u>	alverton, N	<u>faryland</u> 2	20705		
Phone #:	301-595	5-1000	_ Cell #:_		Fax #:				Em	ail:			
Job Information	on												
Job #: 1148-1	16-0225	Job Name:	GRIMM	I & PARKER	Job Lo	cation:	Lansdow	ne Elemen	tary Scho	ol, 2301 Al	<u>ma Road, Bal</u>	imore, Mai	ryland
Building Code	#:		Phone #	•		_Cell #:				Fax #:			
Turn Around	Time Need	ded Date Require	d: /	/ 🗆 Immediate	Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	Day+	DAfter Hours*	(*must be pr	e-scheduled)
Analysis PLM I	Bulk 🔳 EPA	600 Visual Estimate	e 121	(QTY) Pos. Stop(Y)N	EPA Point C	ount	_(QTY) C	J Vacuum V	Vipe (Qualit	tative)	(QTY) 🗆 Par	ticle ID	(QTY)

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
х	CT2	51		2' x 4' white with fissures and pinholes ceiling tile	Classroom K1	
w	СТЗ	52		2' x 4' white smooth surface (drywall) ceiling tile	Boys restroom	
w	СТЗ	53		2' x 4' white smooth surface (drywall) ceiling tile	Girls restroom	
Ŷ	CT4	54		2' x 4' white with decorative gouges and pinholes ceiling tile	Corridor outside Faculty breakroom	
Ŷ	CT4	55		2' x 4' white with decorative gouges and pinholes ceiling tile	Corridor outside Classroom 12	
Z	FC1	56		Blue woven fire curtain	Cafeteria stage	
AA	WCI	57		Gray interior window caulk	Faculty breakroom	, in the second s
AA	WCI	58		Gray interior window caulk	Cafeteria	
BB	WTI	59		4' x 4' white with fissures and pinholes wall tile	Classroom 16	
BB	WTI	60		4' x 4' white with fissures and pinholes wall tile	Classroom 16	

		O SI		
Sampled by:	(Name) Gary Lewis	(Signature) The how / for Cary Lewis	(Date/Time) August 29, 2016	Lab Tracking #
Received by:	Name)I EML	(Signature)	(Date/Time) 8/30/16	
Analyzed by:	Name)	(Signature)	(Dato/Time)	


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PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

Page 7 of 12

Client/Mailing/l	Billing Info	rmation											
Client Name:	GRIMM	& PARKER		Client Address:	<u>11720 E</u>	teltsville l	Drive, Sui	te 600, Ca	lverton, N	<u>1aryland</u> 2	20705		
Phone #:	301-595-1	000	Cell #:		Fax #:				Enta	ail:			
Job Information	n												
Job #: 1148-10	<u>6-0225</u> J	ob Name:	GRIMM	& PARKER	Job Loo	ation:	Lansdow	ne Elemen	tary Scho	ol, 2301 Al	<u>ma Road, Baltimore</u>	<u>, Marylan</u>	<u>id</u>
Building Code #			Phone #:			_Cell #:		<u> </u>		Fax #:			
Turn Around T	'ime Neede	Date Required	:/	/ 🗆 Immediate	Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	🖀 5 Day+	□After Hours* (*must	be pre-selu	eduled)
Analysis PLM B	ulk 🖬 EPA 60	0 Visual Estimate	121 ((OTY) Pos. Ston (Y)N	D EPA Point Co	อนกุร	(OTY) C	J Vacuum V	Vipe (Qualit	ative)	(QTY) Particle ID		(YTÇ

Comments: Please report the results to osharif@appenv.com and Call for any questions 571-238-7784.

HSA#	Material Code	Sample #	Log #	Material Description	Sample Location	Result
CC	WMI	61		Brown mastic associated with 4' x 4' white with fissures and pinholes wall tile	Classroom 16	
CC	WMI	62		Brown mastic associated with 4' x 4' white with fissures and pinholes wall tile	Classroom 16	
w	СТЗ	63		2' x 4' white smooth surface (drywall) ceiling tile	Kitchen serving area	
DD	СРІ	64		Brown ceiling deck panel	Stage sturage/AHU room	
DD	CP1	65		Brown ceiling deck panel	Classroom 18	
DD	СРІ	66		Brown ceiling deck panel	Classroom 8	
EE	TZI	67		Multi-color terrazzo flooring	Corridor outside Classroom 15 near exit door	
ĒĒ	TZI	68		Multí-color terrazzo flooring	Custodial closet	
FF	CB1	69		Black chalkboard mastic	Classroom 10	
FF	СВІ	70		Black chalkboard mastic	Classroom 10	

Sampled by:	(Name) Gary Lewis	(Signature) Any that for Gary Lewis	(Date/Time) August 29, 2016 Lab Tracking #
Received by:	Name) EM	(Signature)	(Date/Time)S/30/16
Analyzed by.	Name)	(Signature)	(Date/Time)

-



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16028252 PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

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Client/Mailing/	Billing Information				
Client Name:	GRIMM & PARKER	Client Address:	11720 Beltsville I	Drive, Suite 600, Calverton, Maryla	1d 20705
Phone #:	301-595-1000	Cell #:	Fax #:	Email:	
Job Informatio	n				
Job #: 1148-1	6-0225 Job Name:	GRIMM & PARKER	Job Location:	Lansdowne Elementary School, 230	l Alma Road, Baltimore, Maryland
Building Code #		Phone #:	Cell #:	F	nx #:
Turn Around T	ime Needed Date Requir	ed:/ 🗆 Immediate 🗆	Same Day 🛛 24 hr	🖸 2 Day 🖬 3 Day 🔲 4 Day 🗐 5 D	y+ DAfter Hours* (*must be pre-scheduled)
Analysis PLM B	ulk 🖬 EPA 600 Visual Estima	ite121_(QTY) Pos. Stop (Y)N 🗆	EPA Point Count	_(QTY) 🗆 Vacuum Wipe (Qualitative)_	(QTY) D Particle ID (QTY)

Comments: Please report the results to osharif@appenv.com and Call for any questions 571-238-7784.

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
GG	СКІ	71		White sink caulk	Women's faculty restroom	
GG	СКІ	72		White sink caulk	Men's faculty restroom	
нн	WC2	73		Gray exterior window caulk	Classroom 18 exterior	
нн	WC2	74		Gray exterior window caulk	S 14 exterior	
ii	١٢D	75		Gypsum wall board with joint compound on skylight	Corridor outside Classroom 18	
11	ונס	76		Gypsum wall board with joint compound on skylight	Corridor outside S8	
11	ונס	77		Gypsum wall board with joint compound on skylight	Corridor outside Classroom 11	
	мл	78		Gray powdery mudded joint on fiberglass insulated pipe	Classroom 4 pipe chase near side exit	
١٤	DCI	79		Gray exterior door caulk	Cafeteria	
11	DCI	80		Gray exterior door caulk	S14	

Sampled by:	(Name) Gary Lewis	(Signature)	From that I for Gary Lewis	(Date/Time)	August 29, 2016	Lab Tracking#
Received by:	Name) 2 12	(Signature)		(Date/Time)	5/30/16	
Analyzed by.	Name)	(Signature)		_ (Date/Time)		



PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

Page 9 of 12

Client/Mailing/	Billing Ini	formation												
Client Name:	GRIMN	I & PARKER		Client Add	lress:	11720	Beltsville	Drive, Sui	te 600, Ca	lverton, N	faryland 2	0705		
Phone #:	301-595	-1000	Cell #:			Fax #:				Em	ail:			
Job Informatio	n													
Job #: 1148-1	6-0225	Job Name:	GRIMM	& PARKI	ER	Job L.c	ocation:	Lansdow	ne Elemen	tary Scho	ol, 2301 Al	ma Road, Balti	more, Mary	land
Building Code #	#:		Phone #				_Cell #:				Fax #:			
Turn Around T	Time Need	ed Date Required	l:/	/ 🗆 In	nmediate	Same Day	🗅 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	S Day+	DAfter Hours*	(*must be pre-	-scheduled)
Analysis PLM B	ulk EPA	600 Visual Estimate	121	(OTY) Pos. S	Stop N	EPA Point C	ount	(QTY) [Vacuum V	Vipe (Qualit	ative)	(QTY) D Part	icle ID	(QTY)

Comments: Please report the results to osharif@ appenv.com and Call for any questions 571-238-7784.

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
11	DC1	81		Gray exterior door caulk	Gray exterior door caulk Cafeteria	
11	DC1	82		Gray exterior door caulk	Classroom 16	
КК	DC2	83		White interior door caulk	S14	
КК	DC2	84		White interior door caulk	Classroom 16	
кк	DC2	85		White interior door caulk	Cafeteria	
LL	PLI	86		Two-coat textured ceiling plaster	Equipment room	
LL	PL1	87		Two-coat textured ceiling plaster	Equipment room	
LL	PLI	88		Two-coat textured ceiling plaster	Equipment room	
мм	DJ2	89		Gypsum ceiling board with joint compound	Equipment room	
мм	DJ2	90		Gypsum ceiling board with joint compound	Equipment room	
impled by:	(Name) Gary	y Lewis		(Signature) And the fit	for Gary Lewis (Date/Time) August 29, 2016	Lah Tracking (
eccived by:	Name)	.777		(Signuture)	(Date/Time) 3/30/16	
nalvzed by	Nume)			(Signature)	(Date/Time)	



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PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

16028252

Page 10 of 12

Client/Mailing/Billing Information GRIMM & PARKER Client Name: Client Address: 11720 Beltsville Drive, Suite 600, Calverton, Maryland 20705 Cell #: Phone #: 301-595-1000 Fax #: Email: **Job Information** Job #: 1148-16-0225 Job Name: **GRIMM & PARKER** Job Location: Lansdowne Elementary School, 2301 Alma Road, Baltimore, Maryland Building Code #: Phone #: Cell #: Fax #: Turn Around Time Needed Date Required: ___ / ___ / __ Immediate Same Day □ 24 hr □ 2 Day □ 3 Day □ 4 Day 🖾 5 Day+ □After Hours* (*must be pre-scheduled) Analysis PLM Bulk = EPA 600 Visual Estimate 121 (OTY) Pos. Stop(7)N D EPA Point Count (OTY) 🗆 Vacuum Wipe (Qualitative) (OTY) 🗆 Particle ID (OTY)

Comments: Please report the results to osharif@appenv.com and Call for any questions 571-238-7784.

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
NN	PL2	91		Two-coat wall plaster	Classroom K1	
NN	PL2	92		Two-coat wall plaster	Classroom 20	
NN	PL2	93	<u>A. (1997)</u>	Two-coat wall plaster Classroom 12		
00	PL3	94		Two-coat ceiling plaster C2		
00	PL3	95		Two-coat ceiling plaster C4		
00	PL3	96		Two-coat ceiling plaster	Recreation storage	
РР	DJ3	97		Gypsum wall board with joint compound	Classroom 20 above side exit door	
РР	DJ3	98		Gypsum wall board with joint compound	Classroom 4 above side exit door	
РР	DJ3	99		Gypsum ceiling board with joint compound	Gypsum ceiling board with joint S11	
QQ	ARI	100		Asphalt roofing tat with pea gravel (top layer)	Roof	

a	or Come Louis	(fit		
Sampled by:	(Name) Gary Lewis	(Signature) / for Gary Lewis	(Date/Time) August 29, 2016	Lab Tracking #
Received by:	Name) Em	(Signature)	(Date/Time)8/36/16	
Analyzed by:	Name)	(Signature)	(Date/Time)	



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AEl Project # 114

PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

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Client/Mailing/l	Billing Infor	mation										
Client Name:	GRIMM &	A PARKER		Client Address:	<u>11720</u>	Beltsville	Drive, Sui	te 600, Ca	ilverton, N	<u>faryland</u> 2	0705	
Phone #:	301-595-10	00	Cell #:		Fax #				Em	ail:		
Job Information	B											
Job #: 1148-10	<u>6-0225</u> Jo	ob Name:	GRIMM	l & PARKER	Job L	ocation:	Lansdow	ne Elemen	tary Scho	ol, 2301 Alı	<u>ma Road, Baltimorc</u>	Maryland
Building Code #			Phone #	• *		Cell #:				Fax #:		
Turn Around T	'ime Needed	Date Required	:/_	🗆 🗆 Immediate	Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	🖬 5 Day+	□After Hours* (*must	be pre-scheduled)
Analysis PLM B	ulk 🖬 EPA 60(Visual Estimate	121	(OTY) Pos. Ston N	EPA Point	Count	(OTY)	J Vacuum V	Vine (Oualit	ative)	(QTY) D Particle ID	(QTY)

Comments: Please report the results to osharif@appenv.com and Call for any questions 571-238-7784.

HSA #	Material Code	Sample #	Log #	Material Description	Sample Location	Result
QQ	ARJ	101		Asphalt roofing tar with pea gravel (top layer)	Roof	
RR	RII	102		Roof insulation with black felt (mid layer)	Roof	
RR	RH	103		Roof insulation with black felt (mid layer)	Roof	
SS	AR2	104		Asphalt roofing tar (bottom layer)	Roof	
SS	AR2	105		Asphalt roofing tar (bottom layer)	Roof	
TT	DM1	106		Gray mastic on fiberglass insulated duct foil	Roof	
TT	DMI	107		Gray mastic on fiberglass insulated duct foil	Roof	
TT	DMI	108		Gray mastic on fiherglass insulated duct foil	Roof	
ບບ	STI	109		Black stair tread	Ladder to gymnasium roof	
ບບ	ST!	110		Black stair tread	Ladder to cafeteria roof	

Sampled by	(Name) Gary Lewis	(Signature) Any to Gary Lewis	(Date/Time) August 29, 2016 Lab Tracking #
Received by:	Name) 27M	(Signature)	
Analyzed by:	Nanie)	(Signature)	(Date/Time)



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NVLAP (#101611-0) 200 Fairbrook Dr., Suite 201, Herndon, VA 20170 (703) 648-0822 Fax (703) 648-0575 www.appenv.com AEI Project #____

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PLM BULK SAMPLE TRANSMITTAL/CHAIN OF CUSTODY

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Chent/Mailing/	Billing Information				1.0	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	a second	S	5	2.52.5	
Client Name:	GRIMM & PARKER	Clien	t Address:	11720	Beltsville	Drive, Sui	te 600, Ca	liverton, N	Aaryland 2	20705	
Phone #:	301-595-1000	_ Cell #:	and the second second second second second second second second second second second second second second second	Fax #:		odrasondara atrija	an and a state of the state of	Em	ail:		
Job Informatio	n										
Job #: 1148-1	6-0225 Job Name:	GRIMM & PA	ARKER	Job Lo	cation:	Lansdow	ne Elemen	tary Scho	ol, 2301 Al	ma Road, Baltimore, M	arviand
Building Code #	4 <u></u>	Phone #:			_Cell #:_				Fax #	a *	
Turn Around T	ime Needed Date Require	d://	_ Immediate	Same Day	🗆 24 hr	🗆 2 Day	🗆 3 Day	🗆 4 Day	5 Day+	□After Hours* (*must be	pre-scheduled)
Analysis PLM B	ulk EPA 600 Visual Estimat	e 121 (QTY)	Pos. StopYN	EPA Point C	ount	(QTY) C	Vacuum V	Vipe (Qualit	tative)	(QTY) D Particle ID	(QTY)

Comments: Please report the results to osharif@appenv.com and Call for any questions 571-238-7784.

HSA#	Material Code	Sample #	Log #	Material Description	Sample Location	Result
vv	FLI	111		Gray flashing on vent	Roof	
vv	FLI	112		Gray flashing on vent	Reof	
xx	RSI	113		Roof shingle on vent	Roof	
xx	RSI	114		Roof shingle on vent	Roof	
YY	FL2	115		Black flashing on perimeter	Roof	
YY	FL2	116		Black flashing on perimeter	Roof	
ZZ	RS2	117		Roof shingle on perimeter	Roof	
ZZ	RS2	118		Roof shingle on perimeter	Roof	
AAA	WC2	119	<u></u>	Gray exterior window caulk	Gymnasium window on roof	
AAA	WC2	120		Gray exterior window caulk	Gymnasium window on roof	
Z	FCI	121	<u></u>	Blue woven fire curtain	Cafeteria stage	

Sampled by:	(Name) Gary Lewis	(Signature) (Signature) (Signature)	(Date/Time) August 29, 2016	Lab Trucking #
Received by:	Name) CM	(Signature)	(Date/Time)S/30/16	
Analyzed by:	Name)	(Signature)	(Date/Time)	

APPENDIX C

XRF LEAD-CONTAINING COMPONENTS

LEAD-CONTAINING COMPONENTS

Index	Time	Floor	Room	Component	Substrate	Condition	Color	РЬС	Unitš
6	2016-08-16 09:41	FIRST	20	WALL	CERAMIC	FAIR	TAN	0.50 ± 0.40	mg/ cm ^2
8	2016-08-16 09:43	FIRST	20	WALL	CONCRETE	FAIR	OFF-WHITE	0.80 ± 0.50	mg/ cm ^2
9	2016-08-16 09:46	FIRST	20	WALL	PLASTER	FAIR	OFF-WHITE	0.50 ± 0.30	mg / cm ^2
13	2016-08-16 09;58	VOID		the state of the				0.60 ± 0.40	mg/ cm ^2
15	2016-08-16 10:02	FIRST	CORRIDOR	WALL	CONCRETE	FAIR	WHITE	0.70 ± 0.40	mg/ cm ^2
16	2016-08-16 10:05	FIRST	CORRIDOR	WALL	CERAMIC	FAIR	TAN	0.80 ± 0.40	mg / cm ^2
17	2016-08-16 10:09	FIRST	K 1	WINDOW SILL	CERAMIC	FAIR	TAN	0.80 ± 0.40	mg / cm ^2
18	2016-08-16 10:12	FIRST	К1	SUPPORT POLE	METAL	FAIR	WHITE	0.13 ± 0.05	mg / cm ^2
22	2016-08-16 10:31	FIRST	3	DOOR FRAME	METAL	FAIR	TAN	0.19 ± 0.21	mg / cm ^2
26	2016-08-16 10:39	FIRST	3	WALL	CERAMIC	FAIR	TAN	1.00 ± 0.40	mg / cm ^2
28	2016-08-16 10:46	FIRST	3	WALL	CONCRETE	FAIR	OFFWHITE	1.00 ± 0.30	mg / cm ^2
29	2016-08-16 10:49	FIRST	3	WALL	WOOD	FAIR	OFFWHITE	0.80 ± 0.30	mg / cm ^2
30	2016-08-16 10:52	FIRST	3	SUPPORT POST	METAL	FAIR	WHITE	0.07 ± 0.03	mg/ cm ^2
31	2016-08-16 10:58	FIRST	13	WALL	CERAMIC	FAIR	TAN	0.90 ± 0.40	mg / cm ^2
32	2016-08-16 11:00	FIRST	13	WALL	CONCRETE	FAIR	OFF-WHITE	1.10 ± 0.30	mg / cm ^2
35	2016-08-16 11:06	FIRST	13	WALL	PLASTER	FAIR	OFF-WHITE	0.70 ± 0.30	mg/ cm ^2
48	2016-08-18 09:15	EXTERIOR FRONT	WALKWAY	POST	METAL	FAIR	BEIGE	3.40 ± 0.50	mg / cm ^2
53	2016-08-18 09:22	EXTERIOR FRONT	WALKWAY	OVERHANG	METAL	FAIR	WHITE	1.50 ± 0.40	mg/ cm *2
54	2016-08-18 09:24	EXTERIOR FRONT	WALKWAY	SUPPORT BEAM	METAL	FAIR	WHITE	1.90 ± 0.50	mg / cm ^2
59	2016-08-18 09:36	FIRST	LOBBY	SUPPORT POST	METAL	FAIR	TAN	0.11 ± 0.05	mg/ cm ^2
60	2016-08-18 09:41	VOID		· · · · · · · · · · · · · · · · · · ·		FAIR		0.40 ± 0.30	mg / cm ^2
61	2016-08-18 09:45	FIRST	LOBBY	WALL	CERAMIC	FAIR	BEIGE	0.60 ± 0.40	mg / cm ^2
63	2016-08-18 09:51	FIRST	LOBBY	BASEBOARD	CERAMIC	FAIR	WHITE	0.16 ± 0.06	mg/ cm ^2
64	2016-08-18 09:56	VOID	•••••	and the first of the second second second second second second second second second second second second second				0.40 ± 0.30	mg/ cm ^2
65	2016-08-18 09:59	FIRST	CAFETERIA	WALL	CERAMIC	FAIR	OFF-WHITE	0.60 ± 0.30	mg/ cm ^2
66	2016-08-18 10:02	FIRST	CAFETERIA	WALL	CONCRETE	FAIR	OFF-WHITE	0.50 ± 0.40	mg/ cm ^2
67	2016-08-18 10:04	FIRST	STAGE	WALL	CONCRETE	FAIR	LIGHT BLUE	0.80 ± 0.50	mg/ cm ^2
70	2016-08-18 10:13	FIRST	KITCHEN	FLOOR	CERAMIC	FAIR	BROWN	0.50 ± 0.40	mg/ cm ^2
71	2016-08-18 10;16	FIRST	KITCHEN	WALL	CERAMIC	FAIR	WHITE	0.70 ± 0.40	mg/ cm ^2
72	2016-08-18 10:21	FIRST	KITCHEN	WALL	CERAMIC	FAIR	BEIGE	0.60 ± 0.40	mg / cm ^2
74	2016-08-18 10:30	FIRST	KITCHEN	WALL	CERAMIC	FAIR	WHITE	0.28 ± 0.20	mg/ cm ^2
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LEAD-CONTAINING COMPONENTS

Index	Time	Floor	Room	Component	Substrate	Condition	Color	PbC	Units
75	2016-08-18 10:32	FIRST	KITCHEN	CEILING	PLASTER	FAIR	BEIGE	0.50 ± 0.30	mg/ cm ^2
76	2016-08-18 10:38	FIRST	KITCHEN	DOOR	WOOD	FAIR	TAN	0.30 ± 0.20	mg / cm ^2
79	2016-08-18 10:57	FIRST	BOILER ROOM	FLOOR	CONCRETE	POOR	GRAY-RED	0.70 ± 0.40	mg/ cm ^2
80	2016-08-18 11:00	FIRST	BOILER ROOM	WALL	BRICK	FAIR	WHITE	1.00 ± 0.40	mg / cm ^2
81	2016-08-18 11:03	FIRST	BOILER ROOM	WALL	CONCRETE	FAIR	WHITE	0.80 ± 0.40	mg / cm ^2
82	2016-08-18 11:06	FIRST	BOILER ROOM	STAIR STRINGER	METAL	FAIR	BLACK	0.17 ± 0.03	mg / cm ^2
83	2016-08-18 11:10	FIRST	BOILER ROOM	HANDRAIL	METAL	FAIR	BLACK	0.08 ± 0.02	mg/ cm ^2
84	2016-08-18 11:11	FIRST	BOILER ROOM	HANDRAIL	METAL	FAIR	BLACK	0.13 ± 0.05	mg / cm ^2
96	2016-08-18 12:04	FIRST	BOILER ROOM RESTROO	FLOOR	CONCRETE	POOR	GRAY	0.60 ± 0.50	mg / cm ^2
97	2016-08-18 12:06	FIRST	BOILER ROOM RESTROO	WALL	CERAMIC	FAIR	TAN	0.70 ± 0.50	mg / cm ^2
98	2016-08-18 12;13	FIRST	C6	WALL	DRYWALL	FAIR	WHITE	0.24 ± 0.14	mg/ cm ^2
104	2016-08-18 12:19	FIRST	C6	CEILING	PLASTER	FAIR	WHITE	0.80 ± 0.70	mg / cm ^2
105	2016-08-18 12:29	FIRST	NEXT TO KITCHEN	WALL	CERAMIC	FAIR	VEITOM	0.80 ± 0.70	mg/ cm ^2
106	2016-08-18 12:31	FIRST	NEXT TO KITCHEN	FLOOR	CERAMIC	FAIR	BROWN	0.50 ± 0.40	mg/ cm ^2
108	2016-08-18 12:35	FIRST	MENS RESTROOM	FLOOR	CERAMIC	FAIR	WHITE	0.80 ± 0.70	mg/ cm ^2
110	2016-08-18 12:42	FIRST	FALCULTY BREAK RM	BASEBOARD	CERAMIC	FAIR	TAN	0.50 ± 0.40	mg/ cm ^2
111	2016-08-18 12:47	FIRST	PRINCIPAL OFFICE	CONVECTOR UNIT	METAL	FAIR	WHITE	0.08 ± 0.06	mg/ cm ^2
112	2016-08-18 12:49	FIRST	PRINCIPAL OFFICE	CONVECTOR UNIT	METAL	FAIR	WHITE	0.08 ± 0.03	mg / cm ^2
113	2016-08-18 12:52	FIRST	ASS. PRINCIPAL OFFICE	WALL	CONCRETE	FAIR	TAN	0.80 ± 0.70	mg/ cm ^2
118	2016-08-18 13:02	FIRST	CORRIDOR	WALL	CERAMIC	FAIR	BEIGE	0.80 ± 0.70	mg/ cm ^2
119	2016-08-18 13:08	VOID		******		1	1	0.30 ± 0.22	mg/ cm ^2
120	2016-08-18 13:13	FIRST	HEALTH ROOM	FLOOR	CERAMIC	FAIR	WHITE	0.50 ± 0.40	mg/ cm ^2

APPENDIX D

Index	Time	Floor	Room	Component	Substrate	Condition	Color	PbC	Units
1	2016-08-16 09:27	CALIBRATION						1.00 ± 0.10	mg/ cm ^2
2	2016-08-16 09:27	CALIBRATION					har yan af an an an an an an an an an an an an an	1.10 ± 0.30	mg / cm ^2
3	2016-08-16 09:29	CALIBRATION	annen forsen i sekreten inden en sekreten in er neten der einer sekreten einer einer einer eine annen annen an F	an na 1996, an an 1986, an an 1986 an ann ann an 1976 an 1980 an an 1976 ann an 1976 an ann an 1976 an ann an 1	namana dalaman kanalaman maningan kanan manya anya siyin na anyana anyana anyana anyana anyan			1.00 ± 0.10	mg/ cm ^2
4	2016-08-16 09:31	CALIBRATION						1.00 ± 0.10	mg/ cm ^2
5	2016-08-16 09:31	CALIBRATION		ar an 198 i shakar kabar abbarra na banfar 198 ka na ka aka ka dan dan dabar abbar abbar da da da aka da da da			And the second sec	0.90 ± 0.20	mg/ cm ^2
6	2016-08-16 09:41	FIRST	20	WALL	CERAMIC	FAIR	TAN	0.50 ± 0.40	mg / cm ^2
7	2016-08-16 09:42	VOID	annan an ann an ann an ann an ann an ann an a	ANAL PARTY VILLEN VILLEN AL MARKET CONTRACTOR AND A METAL AND A METAL AND A METAL AND A METAL AND A METAL AND A	a lan al à la sainean ann ann ann ann ann ann ann ann ann		u 11 1 an ionair 19 19 19 19 19 19 19 19 19 19 19 19 19	0.00 ± 0.02	mg/ cm ^2
8	2016-08-16 09:43	FIRST	20	WALL	CONCRETE	FAIR	OFF-WHITE	0.80 ± 0.50	img / cm ^2
9	2016-08-16 09:46	FIRST	20	WALL	PLASTER	FAIR	OFF-WHITE	0.50 ± 0.30	mg/ cm ^2
10	2016-08-16 09:49	FIRST	20	WINDOW FRAME	METAL	FAIR	TAN	0.02 ± 0.02	mg/ cm ^2
11	2016-08-16 09:52	FIRST	20	DOOR FRAME	METAL	POOR	TAN	0.04 ± 0.02	mg / cm ^2
12	2016-08-16 09:55	FIRST	20	DOOR	METAL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2
13	2016-08-16 09:58	VOID		A A I C A A A A A A A A A A A A A A A A				0.60 ± 0.40	mg/ cm ^2
14	2016-08-16 10:01	VOID					n n an fair ann an an an an an ann an an an an an a	0.00 ± 0.02	mg/ cm ^2
15	2016-08-16 10:02	FIRST	CORRIDOR	WALL	CONCRETE	FAIR	WHITE	0.70 ± 0.40	mg / cm ^2
16	2016-08-16 10:05	FIRST	CORRIDOR	WALL	CERAMIC	FAIR	TAN	0.80 ± 0.40	mg / cm ^2
17	2016-08-16 10:09	FIRST	K1	WINDOW SILL	CERAMIC	FAIR	TAN	0.80 ± 0.40	mg / cm ^2
18	2016-08-16 10:12	FIRST	K1	SUPPORT POLE	METAL	FAIR	WHITE	0.13 ± 0.05	mg / cm ^2
19	2016-08-16 10:15	FIRST	S-14	WALL	DRYWALL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2
20	2016-08-16 10:24	FIRST	3	PARTITION WALL	METAL	FAIR	WHITE	0.00 ± 0.02	mg/ cm ^2
21	2016-08-16 10:27	VOID	are any or a characteristic a second a second second second second second second second second second second se	A CARL AND A CARL AND A CARL AND A CARL AND A CARL AND A CARL AND A CARL AND A CARL AND A CARL AND A CARL AND A	and the second	(All - Charles and a second second - R) (the second second second second second second second second second s	For A	0.04 ± 0.02	mg / cm ^2
22	2016-08-16 10:31	FIRST	3	DOOR FRAME	METAL	FAIR	TAN	0.19 ± 0.21	mg/ cm ^2
23	2016-08-16 10:33	VOID	and and a second s	and the second second second second second second second second second second second second second second second	a	annen Samer ann an ar an an an an an an an Ar Ann an a' ann a'		0.00 ± 0.02	mg/ cm ^2
24	2016-08-16 10:35	VOID	All (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)		a and a second se		Add have	0.00 ± 0.02	mg/ cm ^2
25	2016-08-16 10:36	FIRST	3	DOOR	METAL	FAIR	TAN	0.00 ± 0.02	mg/ cm ^2
26	2016-08-16 10:39	FIRST	3	WALL	CERAMIC	FAIR	TAN	1.00 ± 0.40	mg / cm ^2
27	2016-08-16 10:42	FIRST	3	WALL	DRYWALL	FAIR	OFFWHITE	0.04 ± 0.03	mg / cm ^2
28	2016-08-16 10:46	FIRST	3	WALL	CONCRETE	FAIR	OFFWHITE	1.00 ± 0.30	mg/ cm ^2
29	2016-08-16 10:49	FIRST	3	WALL	WOOD	FAIR	OFFWHITE	0.80 ± 0.30	mg / cm ^2
30	2016-08-16 10:52	FIRST	3	SUPPORT POST	METAL	FAIR	WHITE	0.07 ± 0.03	mg/ cm ^2
31	2016-08-16 10:58	FIRST	13	WALL	CERAMIC	FAIR	TAN	0.90 ± 0.40	mg / cm ^2

Index	Time	Floor	Room	Component	Substrate	Condition	Color	РЬС	Units
32	2016-08-16 11:00	FIRST	13	WALL	CONCRETE	FAIR	OFF-WHITE	1.10 ± 0.30	mg / cm ^2
33	2016-08-16 11:02	VOID			and the second s	and a state of the		0.06 ± 0.08	mg / cm ^2
34	2016-08-16 11:03	FIRST	13	WALL	DRYWALL	FAIR	OFF-WHITE	0.02 ± 0.02	mg/cm^2
35	2016-08-16 11:06	FIRST	13	WALL	PLASTER	FAIR	OFF-WHITE	0.70 ± 0.30	mg / cm ^2
36	2016-08-16 11:08	FIRST	13	DOOR	METAL	FAIR	TAN	0.00 ± 0.02	mg/ cm ^2
37	2016-08-16 11:11	FIRST	13	DOOR FRAME	METAL	FAIR	TAN	0.02 ± 0.02	mg/ cm ^2
38	2016-08-16 13:36	CALIBRATION	an ann an Anna ann ann ann ann ann ann a	Al alle 1 av aven 1/1 mm announcement a new or rest.	and and a subsection of a set of the set of	and the presence of the transmission of the presence of the pr		1.00 ± 0.10	mg/ cm ^2
39	2016-08-16 13:36	CALIBRATION	and and conference on many on the second second second second second second second second second second second	en anna a fi na na marcais in anna d'Anna anna an an an an anna an anna an Anna.	ally a statistical dimensional dimensional and the second second dimensional dimension of the state	n ministry na yan ya' mananan pakakatu ya aka Maninat Antay V Maninatati yi		1.00 ± 0.10	mg/ cm ^2
40	2016-08-16 13:37	CALIBRATION		and the second second second second second second second second second second second second second second second				1.00 ± 0.10	mg/ cm ^2
41	2016-08-16 13:38	CALIBRATION	9 486 - 18 5 - 1 - 18 4 5 - 19 4 5 4 5 - 19 4 5 4 5 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7		A State and a state of the second state of the		affan is 'n o'n slad oan falladen of Anstein Mar benefer	0.90 ± 0.30	mg / cm ^2
42	2016-08-16 13:38	CALIBRATION	and and an an an an an an an an an an an an an	and a second second second second second second second second second second second second second second second	a generation in the second second second second second second second second second second second second second	a na na na na na na na na na na na na na	No. of the second second second second second second second second second second second second second second s	0.80 ± 0.20	mg/cm^2
43	2016-08-16 13:39	CALIBRATION	na daga ing pangang na ang pangang n		A COLUMN COMMENDATION OF A CAMPACITY		Auffent f. e. e. a min. A die een data een Min. Min. een	1.20 ± 0.10	mg/ cm ^2
44	2016-08-18 09:04	CALIBRATION	ana (agana) ao katalan atalah katala di katala di katala (agana) yang yang yang yang yang yang yang yang	anna anna a taon anna maraith ann an anna anna anna anna anna anna	a na anna is daraichtean an	na Anarana (Lag-anga) anany a Anarana Musimud (Lamara)		1.00 ± 0.10	mg/ cm ^2
45	2016-08-18 09:05	CALIBRATION	a name and the state of the sta	A STATE OF THE PARTY IS NOT THE PARTY AND AND A STATE OF A	1	· · · · · · · · · · · · · · · · · · ·		1.00 ± 0.10	mg / cm ^2
46	2016-08-18 09:07	CALIBRATION	mand & an information a majored stream relation of excession of the relation of the relation of the relation of	a name na historia a sua na mana Alabida Milanda (milanda (milanda) da sa sa sa sa sa sanaka ka sa sa	n Bernald (1997-1989 Ar (1976) Britt (1979) an d'an telebrar fan telebrar			1.10 ± 0.10	mg / cm ^2
47	2016-08-18 09:08	CALIBRATION	had i Milen maad Milen oo chiddhahaa Midea ahaa Maddhahaa Middaha Aadaa ah Abaan ah ahaan ah di Maddaach ammi		and the second second second second second second second second second second second second second second second	a hada i dani i u mada mining shaki i u u danini Kilo (1986).	ALL PARA REPORT AND A CONTRACTACT AND A CONTRACT AND A CONTRACT AND A CONTRACT AND A CONTRACT AN	1.10 ± 0.10	mg / cm ^2
48	2016-08-18 09:15	EXTERIOR FRONT	WALKWAY	POST	METAL	FAIR	BEIGE	3.40 ± 0.50	mg / cm ^2
49	2016-08-18 09:19	VOID					······································	0.02 ± 0.03	mg / cm ^2
50	2016-08-18 09:20	VOID		an mark ta ann a mmannaith markili ba dhail i ann abh a sheart (an d-bhail) a				1.90 ± 0.90	mg / cm ^2
51	2016-08-18 09:20	VOID		and stated a subset of a subset of the state				1.60 ± 1.10	mg / cm ^2
52	2016-08-18 09:20	VOID	a channa a mar anns an an anns an an anns an an anns an an		Contracting and Contracting and Contracting Contracting and Contracting Con			1.40 ± 6.20	mg / cm ^2
53	2016-08-18 09:22	EXTERIOR FRONT	WALKWAY	OVERHANG	METAL	FAIR	WHITE	1.50 ± 0.40	mg / cm ^2
54	2016-08-18 09:24	EXTERIOR FRONT	WALKWAY	SUPPORT BEAM	METAL	FAIR	WHITE	1.90 ± 0,50	ung / cm ^2
55	2016-08-18 09:28	EXTERIOR FRONT	WALKWAY	WINDOW FRAME	METAL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2
56	2016-08-18 09:29	VOID	ina mandalanan di fangang malaying dikarka (mpangangan ang antara ang anana an kanang dikar					0.00 ± 0.02	mg / cm ^2
57	2016-08-18 09:30	EXTERIOR FRONT	WALKWAY	DOOR FRAME	METAL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2
58	2016-08-18 09:33	EXTERIOR FRONT	WALKWAY	DOOR	METAL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2
59	2016-08-18 09:36	FIRST	LOBBY	SUPPORT POST	METAL	FAIR	TAN	0.11 ± 0.05	mg / cm ^2
60	2016-08-18 09:41	VOID		n men naga nan a sanang nanan akkapap magi na pipa nani di sina natri , na pi si kaban papapan na pasi , pi da	A REAL PROPERTY AND A REAL PROPERTY OF A REAL PROPE	FAIR		0.40 ± 0.30	mg/cm ^2
61	2016-08-18 09:45	FIRST	LOBBY	WALL	CERAMIC	FAIR.	BEIGE	0.60 ± 0.40	mg/ cm ^2
62	2016-08-18 09:48	FIRST	LOBBY	WINDOW FRAME	METAL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2

Index	Time	Floor	Room	Component	Substrate	Condition	Color	PbC	Units
63	2016-08-18 09:51	FIRST	LOBBY	BASEBOARD	CERAMIC	FAIR	WHITE	0.16 ± 0.06	mg/ cm ^2
64	2016-08-18 09:56	VOID		a nonzer ann anne i same stranover e trans a mer 144				0.40 ± 0.30	mg / cm ^2
65	2016-08-18 09:59	FIRST	CAFETERIA	WALL	CERAMIC	FAIR	OFF-WHITE	0.60 ± 0.30	mg / cm ^2
66	2016-08-18 10:02	FIRST	CAFETERIA	WALL	CONCRETE	FAIR	OFF-WHITE	0.50 ± 0.40	mg / cm ^2
67	2016-08-18 10:04	FIRST	STAGE	WALL	CONCRETE	FAIR	LIGHT BLUE	0.80 ± 0.50	mg / cm ^2
68	2016-08-18 10:07	FIRST	STAGE	DOOR	METAL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2
69	2016-08-18 10:09	FIRST	STAGE	DOOR FRAME	METAL	FAIR	TAN	0.00 ± 0.02	mg/ cm ^2
70	2016-08-18 10:13	FIRST	KITCHEN	FLOOR	CERAMIC	FAIR	BROWN	0.50 ± 0.40	mg / cm ^2
71	2016-08-18 10:16	FIRST	KITCHEN	WALL	CERAMIC	FAIR	WHITE	0.70 ± 0.40	mg / cm ^2
72	2016-08-18 10:21	FIRST	KITCHEN	WALL	CERAMIC	FAIR	BEIGE	0.60 ± 0.40	mg / cm ^2
73	2016-08-18 10:25	FIRST	KITCHEN	WALL	CERAMIC	FAIR	WHITE	0.04 ± 0.07	mg / cm ^2
74	2016-08-18 10:30	FIRST	KITCHEN	WALL	CERAMIC	FAIR	WHITE	0.28 ± 0.20	mg / cm ^2
75	2016-08-18 10:32	FIRST	KITCHEN	CEILING	PLASTER	FAIR	BEIGE	0.50 ± 0.30	mg / cm ^2
76	2016-08-18 10:38	FIRST	KITCHEN	DOOR	WOOD	FAIR	TAN	0.30 ± 0.20	mg / cm ^2
77	2016-08-18 10:44	FIRST	KI	CONVECTOR UNIT	METAL	FAIR	WHITE	0.00 ± 0.02	mg / cm ^2
78	2016-08-18 10:48	FIRST	CORRIDOR	LOCKERS	METAL	FAIR	WHITE	0.01 ± 0.02	mg / cm ^2
79	2016-08-18 10:57	FIRST	BOILER ROOM	FLOOR	CONCRETE	POOR	GRAY-RED	0.70 ± 0.40	mg / cm ^2
80	2016-08-18 11:00	FIRST	BOILER ROOM	WALL	BRICK	FAIR	WHITE	1.00 ± 0.40	mg / cm ^2
81	2016-08-18 11:03	FIRST	BOILER ROOM	WALL	CONCRETE	FAIR	WHITE	0.80 ± 0.40	mg / cm ^2
82	2016-08-18 11:06	FIRST	BOILER ROOM	STAIR STRINGER	METAL	FAIR	BLACK	0.17 ± 0.03	mg / cm ^2
83	2016-08-18 11:10	FIRST	BOILER ROOM	HANDRAIL	METAL	FAIR	BLACK	0.08 ± 0.02	mg / cm ^2
84	2016-08-18 11:11	FIRST	BOILER ROOM	HANDRAIL	METAL	FAIR	BLACK	0.13 ± 0.05	mg / cm ^2
85	2016-08-18 11:13	VOID						0.02 ± 0.02	mg / cm ^2
86	2016-08-18 11:13	VOID	ne - menutan menutan (- A state of the second			Transaction and annual test of the contraction of the second	0.03 ± 0.14	mg / cm ^2
87	2016-08-18 11:17	FIRST	BOILER ROOM	LADDER	METAL	FAIR	BLACK	0.04 ± 0.02	mg / cm ^2
88	2016-08-18 11:19	FIRST	BOILER ROOM	INCINERATOR DOOR	METAL	FAIR	BLACK	0.04 ± 0.02	mg / cm ^2
89	2016-08-18 11:52	FIRST	BOILER ROOM	PIPE	METAL	FAIR	YELLOW	0.00 ± 0.02	mg / cm ^2
90	2016-08-18 11:54	FIRST	BOILER ROOM	DOOR	METAL	FAIR	WHITE	0.02 ± 0.02	mg / cm ^2
91	2016-08-18 11:56	FIRST	BOILER ROOM	PIPE	METAL	FAIR	RED	0.00 ± 0.02	mg / cm ^2
92	2016-08-18 11:57	VOID					A 22 YO MAY TA PROVIDENT AND THE PROVIDENT OF THE PROVIDENT OF THE PROVIDENT	0.01 ± 0.03	mg / cm ^2
93	2016-08-18 11:57	FIRST	BOILER ROOM	PUMP	METAL	FAIR	GREEN	0.00 ± 0.02	mg / cm ^2

Index	Time	Floor	Room	Component	Substrate	Condition	Color	PbC	Units
94	2016-08-18 12:00	FIRST	BOILER ROOM	HVAC WALLPANEL	METAL	FAIR	GREEN	0.00 ± 0.02	mg / cm ^2
95	2016-08-18 12:01	FIRST	BOILER ROOM	TANK	METAL	FAIR	RED	0.00 ± 0.02	mg / cm ^2
96	2016-08-18 12:04	FIRST	BOILER ROOM RESTROOM	FLOOR	CONCRETE	POOR	GRAY	0.60 ± 0.50	mg/ cm ^2
97	2016-08-18 12:06	FIRST	BOILER ROOM RESTROOM	WALL.	CERAMIC	FAIR	TAN	0.70 ± 0.50	mg / cm ^2
98	2016-08-18 12:13	FIRST	C6	WALL	DRYWALL	FAIR	WHITE	0.24 ± 0.14	mg / cm ^2
99	2016-08-18 12:15	FIRST	C6	CONVECTOR UNIT	METAL	FAIR	TAN	0.00 ± 0.02	mg / cm ^2
100	2016-08-18 12:16	VOID	network (net) (net) (network)	ne en sy se se se se se se se se se se se se se		en Challen () - ¹ -		0.01 ± 0.02	mg/ cm ^2
101	2016-08-18 12:17	VOID	(Incompany) (Incompany	and here and the second s				0.01 ± 0.02	mg/ cm ^2
102	2016-08-18 12:18	VOID	an an an an an an an an an an an an an a			a l'intere de la construcción de la construcción de la construcción de la construcción de la construcción de la	man C 14.1 (million of 1) Sector and many	0.01 ± 0.02	mg / cm ^2
103	2016-08-18 12:18	VOID	annen en	antan ang manananan ang ang ang ang ang ang ang ang				0.00 ± 0.02	mg / cm ^2
104	2016-08-18 12:19	FIRST	C6	CEILING	PLASTER	FAIR	WHITE	0.80 ± 0.70	mg / cm ^2
105	2016-08-18 12:29	FIRST	NEXT TO KITCHEN	WALL	CERAMIC	FAIR	YELLOW	0.80 ± 0.70	mg / cm ^2
106	2016-08-18 12:31	FIRST	NEXT TO KITCHEN	FLOOR	CERAMIC	FAIR	BROWN	0.50 ± 0.40	mg / cm ^2
107	2016-08-18 12:35	VOID	ann a chun ann an tha an tha an tha an tha an tha an tha ann an tha an tha ann an tha ann an tha ann an tha ann an tha ann an tha ann an tha ann an tha ann an tha ann an tha ann an tha	and the state of t		ma monte a conservation à format de la conservation de la conservation de la conservation de la conservation de		0.01 ± 0.02	mg / cm ^2
108	2016-08-18 12:35	FIRST	MENS RESTROOM	FLOOR	CERAMIC	FAIR	WHITE	0.80 ± 0.70	mg/ cm ^2
109	2016-08-18 12:37	FIRST	MENW RESTROOM	STALL WALL	METAL	FAIR	GRAY	0.00 ± 0.02	mg / cm ^2
110	2016-08-18 12:42	FIRST	FALCULTY BREAK RM	BASEBOARD	CERAMIC	FAIR	TAN	0.50 ± 0.40	mg / cm ^2
111	2016-08-18 12:47	FIRST	PRINCIPAL OFFICE	CONVECTOR UNIT	METAL	FAIR	WHITE	0.08 ± 0.06	mg / cm ^2
112	2016-08-18 12:49	FIRST	PRINCIPAL OFFICE	CONVECTOR UNIT	METAL	FAIR	WHITE	0.08 ± 0.03	mg / cm ^2
113	2016-08-18 12:52	FIRST	ASS. PRINCIPAL OFFICE	WALL	CONCRETE	FAIR	TAN	0.80 ± 0.70	mg / cm ^2
114	2016-08-18 12:56	FIRST	GIRLS RESTROOM	STALL WALL	METAL	FAIR	PEACH	0.05 ± 0.04	mg / cm ^2
115	2016-08-18 12:58	FIRST	GIRLS RESTROOM	STALL WALL	METAL	FAIR	GRAY	0.00 ± 0.02	mg / cm ^2
116	2016-08-18 13:01	VOID			in and a factor of a later of a second second second second second second second second second second second s	1 1 1		0.10 ± 0.17	mg / cm ^2
117	2016-08-18 13:01	VOID	una anna an fhe anna anna 2 a s a' anna anna anna an anna an anna an an an				a a danka per til som a sa sa sa sa sa sa sa sa sa sa sa sa s	0.10 ± 0.16	mg / cm ^2
118	2016-08-18 13:02	FIRST	CORRIDOR	WALL	CERAMIC	FAIR	BEIGE	0.80 ± 0.70	mg / cm ^2
119	2016-08-18 13:08	VOID		na () an ann an ann ann ann ann ann ann an a' na seamairte (Sei) a s a mar maile an sin Seacha	and a Constant P of Constant Preside in America Strengthered and			0.30 ± 0.22	mg / cm ^2
120	2016-08-18 13:13	FIRST	HEALTH ROOM	FLOOR	CERAMIC	FAIR	WHITE	0.50 ± 0.40	mg / cm ^2
121	2016-08-18 13:20	CALIBRATION	even and an an an an an an an an an an an an an		an an an an an an an an an an an an an a	n (million - 2003) - Million Combiline - 200		1.20 ± 0.10	mg / cm ^2
122	2016-08-18 13:21	CALIBRATION		annan an a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' tha a' t	and a set of the set o			0.90 ± 0.10	mg/cm ²
123	2016-08-18 13:21	CALIBRATION						0.90 ± 0.10	mg / cm ^2
124	2016-08-18 13:22	CALIBRATION	- provide the set of the set interference and sector (in the set of the se				ntakanan () 🗧 milang na sa ng tanan na ng tanan na sa ng tan	1.00 ± 0.10	mg / cm ^2

APPENDIX E

DRAWINGS





OOR		DRA	WN BY	SCALE		
FIRST (A)			OAS	NTS		
RVEY	DATE 08/15-23/	2016	JOB NO. 1148-16-02	25	DATE	09-20-2016





LEGEND



OOR	DRAW	DRAWN BY			SCALE		
FIRST (B)		OAS			NTS		
RVEY DATE 08/15-23/2	JOB NO.	1148-16-02	25	DATE	09-20-2016		



LEGEND

00	SUSPECT ACM SAMPLE NUMBER (NEGATIVE)
00	ACM SAMPLE NUMBER (POSITIVE)
00	SAMPLE NOT ANALYZED POSITIVE STOP

OOR	ROOF (A)	DRA	WN BY OAS	SC	ALE N	rs
RVEY	DATE 08/15-23/	2016	JOB NO. 1148-16-02	25	DATE	09-20-2016





LEGEND

00	SUSPECT ACM SAMPLE NUMBER (NEGATIVE)
00	ACM SAMPLE NUMBER (POSITIVE)
00	SAMPLE NOT ANALYZED POSITIVE STOP

OOR DRAW		N BY		SCALE			
	ROOF (B)		0/	AS		NT	S
IRVEY	DATE 08/15-23/2	016	JOB NO.	1148-16-02	25	DATE	09-20-2016

SECTION 02 30 00 - SUBSURFACE DRILLING AND SAMPLING INFORMATION

PART 1 GENERAL

- 1.1 The following information is included in the Project Manual for bidders' use in preparing bids, but is not part of the Contract Documents, and does not relieve the bidders from doing their own investigation to determine the accuracy of the information.
 - A. Geotechnical Engineering Report, Lansdowne Elementary School (Project No. 362216); dated May 13, 2016.
- 1.2 STATEMENT CONCERNING THE BORING DATA
 - A. The test borings and samples of the soils encountered were obtained by the Architect to assist the Architect and his consultants in determining the type and design of the foundation systems.
 - B. The test borings were made by Geotech Engineers, Inc., in accordance with their system of soils classification and they, Geotech Engineers, Inc., neither the Owner, the Architect, or his consultants guarantee the accuracy or consistency of the information contained within the Geotechnical Report with the actual site conditions.
 - C. Any radical deviation from the anticipated material, as indicated by the borings, during the excavation for the building should be reported to the Architect immediately and confirmed in writing.
- 1.3 CONFIRMATION OF BORING DATA
 - A. Bidders, Contractors, and any others who are concerned with, or are affected by the test borings should make their own borings and tests at the site.
 - B. No additional compensations will be allowed the Contractor for failure to fully investigate the site or for the neglect of the information contained in the Boring Logs.

1.4 ATTACHMENT

A. Geotechnical Engineering Report, Lansdowne Elementary School (Project No. 362216); dated May 13, 2016.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION



GEOTECHNICAL ENGINEERING REPORT

FOR

LANSDOWNE ELEMENTARY SCHOOL 2301 ALMA ROAD BALTIMORE, MD



May 13, 2016

Prepared by :

GEOTECH ENGINEERS, INC. 11890 Old Baltimore Pike, Suite U Beltsville, MD 20705



May 13, 2016

Grimm and Parker Architects 11720 Beltsville Dr., Suite 600 Calverton, MD 20705

Attn: Ms. Karen Burlingame, AIA



GEOTECH ENGINEERS, INC.

11890-U Old Baltimore Pike Beltsville, MD 20705 Tel. 301.937.9227 Fax. 301.937.9189 www.geotechengineersinc.com

Project:

Geotechnical Engineering Report, Lansdowne Elementary School 2301 Alma Road Baltimore, MD (Project No. 362216)

Dear Ms. Burlingame:

Submitted herewith is our geotechnical engineering report for the above project.

Services performed under this agreement included the drilling of forty eight soil test borings, six infiltration tests, soil laboratory tests and preparation of a geotechnical engineering report. Our report includes the following:

- a. General subsurface conditions within the site.
- b. Foundation recommendations for support of the proposed building and floor slab. An allowable soil bearing pressure and estimated settlement are included.
- c. Earthwork requirements. Comments on the suitability of on-site materials for reuse as controlled fill are included.
- d. Infiltration rates.
- e. Recommended pavement section.
- f. Seismic soil classification.
- g. Geotechnical engineering considerations during construction.

Services for environmental study, wetland and asbestos study, erosion control, cost or quantity estimates, slope stability analysis, construction inspection and other professional services not mentioned above are not included in the scope of this study.

Soil samples will be held until May 29, 2016 and then discarded unless other disposition is requested.

We appreciate the opportunity to be of service for this project. Please call the undersigned if you have any questions regarding the enclosed report.

Sincerely,



Jeff S. Paik, Ph,D., PE State of Maryland



Paul Chung, P.E State of Maryland

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GEOTECHNICAL ENGINEERING REPORT LANSDOWNE ELEMENTARY SCHOOL 2301 ALMA ROAD BALTIMORE, MD

1.0 <u>SUMMARY OF RECOMMENDATIONS</u>

The following is a summary of our recommendations for this project:

- a. Test borings indicate that the proposed building area is underlain by existing clay fill extending to 0 to 13.5 ft below grade. Medium to very stiff clay and firm to compact sand layers were encountered below the existing fill. The groundwater table was not recorded except for one boring where the groundwater was recorded at a depth of 22 ft below grade.
- b. We recommend that Rammed Aggregate Piers (RAP's) be installed to support the proposed building in the south and western portions of the building where relatively deep existing fill was encountered and deep new fill is planned. RAP's should be installed deep enough to provide a design soil bearing pressure of 5000 psf. The depths of RAP's should be determined by the specialty contractor based on the subsurface information provided herein. Settlement of footings founded on RAP's should not exceed 1 inch with differential settlement less than 1/2 inches.
- Footings in the eastern and northern portions of the building may be supported by the stiff clay of Stratum B. A soil bearing pressure of 3000 psf is recommended for the footings on natural clay. Wall footings should be at least 18 inches wide for considerations of shear. Settlement of footings founded on the stiff clay is not expected to exceed 1 inch with differential settlement not exceeding 1/2 inches.
- d. An earth-supported floor slab along with 4-inch gravel base is considered suitable. A modulus of subgrade reaction (Ks) of 100 kcf is recommended for the floor slab design.
- e. Soil site class D is recommended for the seismic design.
- f. New controlled fill is expected to be required for the proposed building and parking lot. Materials classified as ML, SC, SM, SP, SW or more granular soils per ASTM D-2487 are considered suitable for controlled fill. Controlled fill for the building should be compacted to at least 95 percent of the maximum dry density as determined by ASTM D-1557. Controlled fill for parking lot and sidewalk should be compacted to at least 90 percent per the same standard. Excavated clay of Strata A and B is <u>not</u> considered suitable for reuse as controlled fill. However, the sand of Stratum C, if excavated, may be reused for controlled fill.
- g. The infiltration rates obtained from the in-situ tests and groundwater conditions are summarized as follows:

Boring No./Test	Infiltration	Groundwater		Soil
Depth	Rate (in/hr)	Depth Below	Elevation	Description at
		Surface		Test Depth
SWM-1/2.0'	0	Dry @ 15'	Dry @ El 136	Fill
SWM-2/7.0'	0	Dry @ 10'	Dry @ El 143	Clay
SWM-3/7.0'	0	Dry @ 10'	Dry @ El 145	Clay
SWM-4/7.0'	0	Dry @ 10'	Dry @ El 148	Clay
SWM-5/3.0'	0	5.3'	El 149.7	Clay
SWM-6/2.0'	0	3.0'	El 148.0	Existing Fill
SWM-7	Not	2.0'	El 143.0	Existing Fill
	Performed			
SWM-8	Not	9.8'	El 142.2	Existing Fill
	Performed			

Based on the above test data, infiltration practice is not feasible in all proposed SWM locations.

i. Recommended pavement sections are as follows:

	Recommended Pavement S Light Duty Heav	
Asphalt Surface	1.5 inches	2 inches
Asphalt Base	2.5 inches	4 inches
Aggregate Basecourse	4 inches	6 inches

The light duty section may be applied for passenger car parking spaces and driving lane while the heavy duty section is for the major driveway, bus loop and fire lane.

2.0 DESCRIPTION OF SITE AND PROPOSED CONSTRUCTION

The subject site is Lansdowne Elementary School located in the southeast quadrant of the intersection between Alma Road and Lansdowne Road in Baltimore, MD as included in Appendix A. The site is also bordered by residential development to the south and east. A new school will be built in the same site. The existing school building is a one-story structure and is located in the southwestern portion of the site. The existing building has a small mechanical basement in the southern end. A tennis court is located in the northeast portion while ball fields are located each in the northwestern and southeastern portions of the site. There are three temporary classroom trailers in the site. A passenger car parking lot and bus dropoff areas are located in the south and west of the existing school building, respectively. All the existing structures, we understand, will be demolished during the course of the new construction.

A new school building is planned in the northeastern portion of the site. Exiting grade within the proposed building varies from El 156 to El 149 based on the site plan provided to us. The proposed school building will be one and two story steel framed structures without basement. The lower floor slab is

planned at El 155.0. The proposed structure will be supported by combination of bearing walls and steel columns. The exterior walls will be of masonry. The anticipated column loads provided to us by Columbia Engineering are listed as follows:

Interior Column:	100 kips - 250 kips
Ext. Column:	50 kips - 150 kips
Bearing Wall:	5 klf to 10 klf

There are several existing storm pipes and surface inlets installed in the west of the proposed building where the existing grade is low. A soccer field is planned in the northwest corner of the lot and baseball field in the southeast corner. A parking lot is planned in the west of the proposed building. No other details of the proposed construction are available at this time of reporting.

3.0 <u>SUBSURFACE CONDITIONS</u>

Forty eight test borings were drilled during March of 2016 to explore the subsurface conditions of the site. Four soil profiles were presented to aid in our analysis and included in Appendix F. The boring logs and locations are also included in Appendix G. Note that Borings B1 to B10 and SWM-1 to SWM-8 were drilled for the site work and stormwater purposes, respectively.

Test borings and Standard Penetration Tests (SPT's) were conducted in accordance with ASTM D-1586. The number of hammer blows required to drive a split spoon 12 inches is defined as "N" value. Soil samples were classified in accordance with ASTM D-2487 as included in Appendix B.

3.1. <u>Soil Stratification</u>

Test borings indicate the following generalized soil strata underlying the building pad:

Stratum A: Existing Fill. Consisted of sandy clay and silty sand containing rocks and roots. Encountered at the surface and extended to depths of 0 to 13.5 ft below grade. N values were in the range of 4 to 24, indicating soft to very stiff consistency.

Stratum B: Brown and gray sandy lean CLAY (CL) and lean CLAY (CL) containing occasional ironite ledges. Encountered below Stratum A and extended to depths of 8.5 to 30 ft below grade. N values were in the range of 7 to 100+, indicating medium to very stiff consistency.

Stratum C: Brown and gray silty SAND (SM) containing occasional ironite ledges. Encountered below Stratum B or interbedded in Stratum B, and extended up to 50 ft, the maximum depth of the borings. N values ranged from 13 to 100+, indicating firm to very compact density.

3.2. <u>Geology</u>

The existing fill of Stratum A was probably placed during the construction of the existing school. The brown sandy lean clay of Stratum B and brown, red and gray sand of Stratum C are the Patuxent formation of Cretaceous age. High SPT values recorded in Strata B and C are probably due to the presence of ironites. Patauxent soils are generally considered to be highly preconsolidated due to previous overburden which has since been eroded.

3.3. <u>Groundwater</u>

In the building area, the groundwater table was not encountered during drilling and 24 hrs after completion except for Boring B36 where the groundwater table was recorded at a depth of 22.0 ft below grade at about 24 hrs after completion.

In the general site, the groundwater table was recorded at a depth of 2.5 ft below grade in Boring B7 only, which is believed to be trapped water in fill. The actual groundwater table in the general site work area, however, is believed to be deeper than 10 ft below the current grade.

The groundwater conditions in the stormwater management areas are discussed and included in the "Infiltration" section.

The water reading data shown in the boring logs represents the hydrostatic groundwater conditions at the time of our investigation. Fluctuations in the groundwater table should, however, be expected depending on precipitation, evaporation and other similar factors.

4.0 SOIL LABORATORY TESTS

Laboratory tests were performed in our soil laboratory on several selected samples. The samples were classified according to ASTM D-2487. A summary of soil laboratory tests along with the gradation curves, moisture contents, Atterberg limits, moisture-density test and CBR curves are included in Appendix C. The test results are summarized as follows:

- Stratum B: Three samples recovered from this stratum were tested. The samples consisted of 0 to 7.1 percent gravel, 6.5 to 11.5 percent sand and 81.4 to 93.5 percent fines. Atterberg Limits tests showed liquid limits of 29.5 to 33.6 and plasticity indices of 9.8 to 13.2. The samples were classified as lean CLAY (CL) and lean CLAY with sand (CL).
- Stratum C: One sample was tested. The sample consisted of 0 percent gravel, 91.7 percent sand and 8.3 percent fines. Fines appeared to be non-plastic. The sample was classified as poorly graded SAND with silt (SP-SM).

Pavement Subgrade:

Two bulk samples recovered from the pavement subgrade were tested. The gradation tests indicated that the samples consisted of 0.3 to 0.7 percent gravel, 8.1 to 20.6 percent sand and 79.1 to 91.2 percent fines. Atterberg Limit tests showed liquid limits of 39 to 40 and plasticity index of 17 to 18. The samples were classified as lean CLAY with sand (CL) and lean CLAY (CL). Moisture density relation tests showed a maximum dry density of 115.8 to 123.3 pcf and optimum moisture content of 10.8 to 12.5 % according to ASTM D-1557. California Bearing Ratio (CBR) tests showed CBR values of 2.0 and 1.2 at 95 percent compaction. A swell of 7.8 and 9.7 percent was recorded, indicating relatively high swelling potentials.

5.0 FOUNDATION RECOMMENDATIONS

The test borings show that the site is generally underlain by existing fill at the surface and extending up to approximately El 135.5. Medium to very stiff clay of natural origin was encountered below the existing fill. Considering the proposed first floor slab at El 155.0, competent bearing soils are generally expected to be present at the normal footing level in the north and east portions of the proposed building. However, existing fill or new controlled fill is anticipated to be encountered in the remaining portions of the building. Spread footings directly founded on existing fill are not considered suitable due to possible excessive differential settlement. We recommend that existing fill and compressible clay in the south and western portions be modified with rammed aggregate piers (RAP's) for proper building support.

5.1. Spread Footings

Normal spread footings founded on the natural soils are recommended in the north and east sections of the proposed building. Footings founded on the stiff to very stiff clay of Stratum B may be designed for a soil bearing pressure of 3000 psf. Wall footings should be at least 18 inches wide for considerations of shear. A safety factor of at least 2.5 was considered against shear failure. The approximate extent of spread footings founded on natural soils is illustrated in Appendix E.

Footings are expected to be founded at normal structural depths. We have estimated the highest footing subgrade elevations for the proposed soil bearing pressure as follows:

Boring No.	Highest Footing	Soil	Boring No.	Highest Footing	Soil
	Subgrade Elevation	Bearing,		Subgrade	Bearing,
		psf		Elevation	psf
B11	153.5	3000	B26	RAP	5000
B12	154	3000	B27	153	3000
B13	154	3000	B28	152.5	3000
B14	RAP	5000	B29	RAP	5000
B15	RAP	5000	B30	RAP	5000
B16	153.5	3000	B31	150.5	3000
B17	153.5	3000	B32	151.5	3000
B18	154	3000	B33	RAP	5000
B19	RAP	5000	B34	RAP	5000
B20	RAP	5000	B35	RAP	5000
B21	154	3000	B36	RAP	5000
B22	153	3000	B37	RAP	5000
B23	153.5	3000	B38	RAP	5000
B24	RAP	5000	B39	RAP	5000
B25	RAP	5000	B40	RAP	5000

The above elevations are design purposes only without considering the proposed floor elevation. Final footing subgrade, however, should be determined by the geotechnical engineer in the field during construction. Footing subgrade elevations between the borings may be determined by linear interpolation. Footings founded on RAP may be installed at a normal structural depth.

Settlement of footings is not expected to exceed 1 inch and differential settlement between the adjacent footings should not exceed half this amount.

Perimeter footings and footings in any unheated areas should be founded at least 2.5 feet below the final exterior grade for frost protection.

Footings may be lowered as necessary. In that case, a slope of 1.5H to 1V or flatter should be maintained between the bottom edges of the adjacent footings.

5.2. <u>Rammed Aggregate Piers (RAP's)</u>

Rammed aggregate piers are recommended in the west and south portions of the proposed building where relatively deep existing fill was present and new controlled fill is to be placed over the existing fill.

RAP's are generally drilled to the predetermined depths first. Then crushed stone with thickness of 2 to 4 ft are initially poured through the shaft and rammed to the bottom of the hole. After the bottom bulb is installed, crushed stones are placed and compacted with approximate one foot lift during retrieving. MDOT No. 57 crushed stones are generally considered suitable for this purpose.

Spread footings founded on RAP may be designed for a soil bearing pressure of 5000 psf. The length of RAP's are expected to vary from El 129 to El 145, but should be installed below the existing fill. The estimated RAP tip elevations for a 250 kips column are assumed as listed below:

Boring No.	Est. RAP	Boring No.	Est. RAP
	Tip Elevation		Tip Elevation
B15	134	B33	130
B19	130	B34	144
B20	136	B35	145
B25	125	B36	143
B26	137	B37	135
B29	142	B38	144
B30	142	B39	129
		B40	143

The above elevations are for information purposes only and should not be used for the actual RAP design. Detailed design of RAP should be performed by a specialty contractor and shop drawings submitted to the architect for review and approval. For a preliminary design, a pier capacity of 80 kips may be considered for each RAP.

RAP may be added or deleted for some footings in the transition area. We recommend that several test pits be excavated in the transition area prior to RAP installation to determine if revisions on RAP plans are required. The test pits results should be reviewed by the geotechnical engineer of record.

Aggregate lift thickness should not exceed 18 inches in loose thickness. Pier lengths below the bottom of footing should be at least 8 feet. A minimum pier diameter should be 20 inches.

Modulus tests should be performed to verify the parameter values selected for design. Testing should be performed to a stress level of 150% of the design stress identified on the plans. A telltale should be installed at the bottom of all test piers so that bottom-of-pier deflections may be determined. Acceptable performance is indicated when the bottom of the pier deflection is no more than 20% of the top of pier deflection at the design stress level.

Footings founded on RAP's may be designed for an allowable soil bearing pressure of 5000 psf. Wall footings may also be designed for the same bearing pressure, but should be at least 18 inches wide for considerations of shear.

Settlement of footings is not expected to exceed 1 inch and differential settlement between the adjacent footings should not exceed half of this amount.

Expansion joints between the footings supported by RAP's and natural soils are not required as spread footings are to be used throughout the building.

5.3. Floor Slab

The first floor slab is generally expected to be founded on existing fill, new controlled fill and stiff natural clay. An earth supported floor slab is considered suitable and recommended. A 4-inch gravel base along with an 8 mil plastic is recommended as a moisture barrier. Any pockets of soft soils, if encountered at the subgrade, should be undercut and replaced with controlled fill or crushed stone as detailed in the "Earthwork Recommendations" section.

Proofrolling is recommended for the floor slab subgrade. Our recommendations on subgrade preparation are included in the "Earthwork Recommendations" section.

A modulus of subgrade reaction (Ks) of 100 kcf is recommended for the floor slab design.

Since clay is expected to be present at the floor slab subgrade in cut sections, moisture control should be carefully performed for the clay. Any disturbed clay at the subgrade, if present, should be removed and replaced with controlled fill.

5.4 <u>Seismic</u>

The test borings show that the site is underlain by stiff to very stiff clay and firm to compact sand extending to 50 ft below grade. Although the borings did not extend to 100 ft which is required by IBC for seismic soil classification, a local geology map shows that dense Cretaceous soils extend to bedrock which is believed to be present deeper than 100 ft below surface in this area. Based on the local geology and the available test borings, we recommend that Site Class D be used for the seismic design according to IBC.

6.0 **INFILTRATION**

6.1. <u>Subsurface Conditions</u>

Eight borings (SWM-1 to SWM-8) were drilled in the area of the proposed stormwater management structures. The following is a summary of subsurface condition at each proposed micro bioretention structure:

SWM-1: Fill extending to a depth of 13.5 ft was encountered, which was underlain by stiff fat clay of natural origin. The groundwater table was not recorded during drilling and 24 hrs after completion.

SWM-2: Fill extending to a depth of 2.5 ft below grade was encountered, which was underlain by stiff sandy lean clay of natural origin. The groundwater table was not recorded during drilling and 24 hrs after completion.

SWM-3: Fill extending to a depth of 5.0 ft was encountered, which was underlain by stiff fat clay with sand of natural origin. The groundwater was not recorded during drilling and 24 hrs after completion.

SWM-4: Fat clay of natural origin extended from the surface to a depth of 10 ft, the maximum depth of the boring. The groundwater table was not recorded during drilling and 24 hrs after completion.

SWM-5: Fat clay with sand of natural origin extended from the surface to a depth of 10 ft, the maximum depth of the boring. The groundwater table was not recorded during drilling, but 24 hr readings showed the groundwater at a depth of 5.3 ft below grade.

SWM-6: Fill extending to a depth of 8.5 ft was encountered, which was underlain by stiff sandy lean clay of natural origin. The groundwater table was recorded at a depth of 3.0 ft below grade after 24 hrs. This water table is believed to be trapped water in fill.

SWM-7: Existing fill extending to a depth of 5 ft below grade was encountered. Note that boring was terminated at 5 ft due to obstruction. The groundwater table was not recorded during drilling, but 24 hrs readings showed the groundwater at a depth of 2.0 ft below grade, which is believed to be trapped water in fill.

SWM-8: Existing fill extending to a depth of 15 ft below grade was encountered. The groundwater table was not recorded during drilling, but 24 hrs readings showed the groundwater at a depth of 9.8 ft below grade.

6.2. <u>Infiltration Tests</u>

Infiltration tests were performed in six holes (SWM-1 to SWM-6) drilled adjacent to SWM borings. The tests were generally conducted as follows:

- a. A 7-inch diameter borehole was prepared to a designated depth.
- b. A 4-inch diameter solid PVC casing was inserted and the borehole was presoaked overnight.

- c. On the next day, the hole was refilled with water to 30 inches from the bottom.
- d. Water levels in the pipe were monitored at every 30 min for 4 hours.

The results of the in-situ infiltration test are included in Appendix D and are summarized as follows:

	Infiltration	Groundwater		Soil	Remarks
Boring No./Test	Rate (in/hr)	Depth Below	Elevation	Description at	
Depth		Surface		Test Depth	
SWM-1/2.0'	0	Dry @ 15'	Dry @ El 136	Fill	
SWM-2/7.0'	0	Dry @ 10'	Dry @ El 143	Clay	
SWM-3/7.0'	0	Dry @ 10'	Dry @ El 145	Clay	
SWM-4/7.0'	0	Dry @ 10'	Dry @ El 148	Clay	
SWM-5/3.0'	0	5.3'	El 149.7	Clay	
SWM-6/2.0'	0	3.0'	El 148.0	Existing Fill	Trapped
					Water
SWM-7	Not	2.0'	El 143.0	Existing Fill	Trapped
	Performed				Water
SWM-8	Not	9.8'	El 142.2	Existing Fill	
	Performed				

6.3. <u>Recommendations</u>

Based on the above infiltration tests and subsurface investigation data, infiltration practice in the above SWM locations is not considered feasible.

7.0 EARTHWORK RECOMMENDATIONS

The grading plans call for up to about 6 ft of controlled fill within the building pad. Some new fill may also be placed in the parking lot although final grading plans are not available at the time of this reporting.

7.1. <u>Subgrade Preparation</u>

Topsoil, existing sidewalk, pipes, inlets and asphalt pavement present within the area of the proposed building and parking lot should be removed first. We recommend that the exposed subgrade be proofrolled by a 20-ton loaded dump truck or other similar construction equipment. Proofrolling should be performed in a grid pattern to check the subgrade conditions in all directions. Proofrolling should be performed under the supervision of the geotechnical engineer and any significant pumping or rutting, if encountered, should be removed and replaced with controlled fill.

7.2. <u>Controlled Fill</u>

Soils classified as ML, SM, SC, SP, SW or more granular soils in accordance with ASTM D-2487 are considered suitable for controlled fill for support of the building, pavement and any site structures. Proposed fill materials should have a maximum dry density of at least 110 pcf

as determined by ASTM D-1557. However, all materials proposed for controlled fill should be tested and approved by the geotechnical engineer prior to use. The on-site excavated soils of Stratum C are generally considered suitable for use as controlled fill. However, moisture contents of the excavated soils should be checked prior to use. The clay of Strata A and B should not be used for new controlled fill for any structural support, but may be used for grading fill.

Controlled fill in the building area should be placed in loose lifts not exceeding 8 inches in thickness and be compacted to at least 95 percent of the maximum dry density as determined by ASTM D-1557. New fill and stone base under the sidewalk, curb and gutter, patio and pavement should be compacted to at least 90 percent per the same standard. New fill in the grass area may be compacted to 85 percent.

Backfill for the utilities and behind the wall should be placed and compacted in accordance with the controlled fill requirements as detailed above.

8.0 PAVEMENT RECOMMENDATIONS

8.1. <u>Soil Conditions</u>

Since final grading plans are not available at this time, we assumed for our study, that majority of the paved areas be raised up for the final grading and be supported by the controlled fill. If existing clay is to support the pavement, however, undercutting of 12 inches will be required to remove clay at the pavement subgrade.

We recommend that pavement subgrade be proofrolled as recommended in the earlier section. Any "pumping" areas and pockets of soft soil should be undercut and replaced with suitable controlled fill or GAB.

Upon successful proofrolling, the top 12 inches of pavement subgrade should be compacted to 95 percent according to ASTM D-1557. Pavement fill below the top 12 inches may be compacted to 90 percent.

8.2. <u>Recommended Pavement Sections</u>

We assumed for our study, that the proposed parking lot would be served for primarily passenger cars with occasional delivery trucks. For the bus loop, we assumed about 60 bus traffic per day. Two CBR tests were performed and laboratory CBR values of 2.0 and 1.2 were recorded. These CBR values are generally considered to be very low. Swell of 7.8 to 9.7 percents also indicate relatively high swelling potentials. We recommend that clay should not be used for direct support of the pavement and should be undercut by 12 inches if present at the pavement subgrade. Considering the proposed design which requires new controlled fill in most of the paved areas, we selected a CBR value of 5 for new controlled fill for this study.

The following pavement section is recommended for this project:

Recommended Pavement Section Light Duty Heavy Duty

Asphalt Surface	1.5 inches	2 inches
Asphalt Base	2.5 inches	4 inches
Aggregate Basecourse	4 inches	6 inches
(GAB)		

The light duty section may be applied for passenger car parking spaces and driving lane while the heavy duty section is for the major driveway, bus loop and fire lane. Graded aggregate base (GAB) is recommended for the aggregate base. The aggregate basecourse should be compacted to 95 percent per ASTM D-1557.

Prior to placement of asphalt pavement, GAB layer should be thoroughly proofrolled again to detect any problem areas.

Reinforced concrete slab is recommended for the loading docks and dumpster pad to minimize any damages due to heavy concentrated load.

The design CBR value of 5 should be verified during the construction with the actual fill soils. CBR for the proposed fill should be at least 5.

9.0 <u>CONSTRUCTION CONSIDERATIONS</u>

9.1. <u>Rammed Aggregate Piers (RAP's)</u>

Shop drawings including spread sheets which show detailed output for each column should be submitted to the Architect for review and approval. The proposed depths and size of RAP's should be also submitted.

Modulus tests should be performed by the contractor and witnessed by the geotechnical engineer to confirm the pier modulus used in the design. The RAP design should be revised if modulus tests failed.

Quality control is an essential part of successful RAP's. Quality control will include inspection and documentation of the work activity, pre-drill diameter and depth, time, aggregate quantity and vibration depth. We will be glad to assist in this service.

9.2. <u>Spread Footing</u>

Footings supported by RAP's should be fully founded on RAP's. For the footings founded on natural soils, subgrade should be observed and tested by the geotechnical engineer to ascertain that footings are placed on a suitable subgrade as recommended herein. Care should be taken during excavation to minimize the disturbance of the bearing soils.

We recommend that footings be excavated and poured the same day in order to preclude ponding of any surface water in the footing excavation. Disturbed, frozen or softened soils should be removed prior to placement of concrete.

9.3. <u>Floor Slab Subgrade</u>

The floor subgrade should be observed by the geotechnical engineer prior to placement of the gravel base. Where the subgrade has been disturbed due to construction activity or other causes, the disturbed material should be replaced with crushed stone or controlled fill. Any trenches excavated for utility construction in the building should be backfilled with controlled fill or crushed stone.

9.4. <u>Earthwork</u>

We recommend that earthwork be performed between May and November to minimize problems with weather and wet on-site soils. Pavement subgrade may be saturated in the wet season. Undercutting or soil cement may be required if earthwork is to be performed in the winter time or in the wet season. The contractor should be prepared for proper surface runoff during construction.

For parking lot and driveway, pavement subgrade should be visually inspected by the geotechnical engineer for the presence of clay. If clay is encountered at the final design grade, clay should be undercut by 12 inches and be replaced with controlled fill or GAB.

9.5. Observation During Construction

The analysis and recommendations submitted in this report are based on the data obtained from the test borings performed at the locations indicated on the boring location plan. This report does not reflect any variations, which may present in the area between the borings. The nature and extent of variations between the borings may become evident only at the time of construction.

Careful monitoring during earthwork is essential for successful foundation work. It is recommended that **Geotech Engineers, Inc**. be retained as a quality control agency to perform professional observations for footing, geopiers and floor subgrade, proofrolling and performing field density tests during placement of controlled fill.

10.0 GENERAL AND LIMITATIONS

It is recommended that we be provided the opportunity to review the final foundation plans and specifications to determine whether our recommendations have been properly applied.

Some variations in the soil conditions between the borings should be anticipated. An allowance should be established to account for additional costs that may be required during construction.

We have prepared this report for the use of the design professional for design purposes in accordance with generally accepted geotechnical engineering practices. No warranty, expressed or implied, is made as to the professional advice included in this report.

APPENDIX

APPENDIX A	Vicinity Map
APPENDIX B	Soil Classification Chart (ASTM)
APPENDIX C	Summary of Soil Laboratory Tests Gradation Curves (6) Moisture Density Relation Report s (2) CBR Reports (2)
APPENDIX D	Infiltration Test Reports SWM-1 to SWM-6
APPENDIX E	Foundation Plan
APPENDIX F	General Soil Profiles Profiles 1, 2, 3 and 4
APPENDIX G	Test Boring Report Boring Logs, B1 to B40 & SWM-1 to SWM-8 Boring Location Plan


SOIL CLASSIFICATION CHART (ASTM D-2487)

					Soil Classification
Criteri	a for Assigning Group Syn	bols and Group Names	Using Laboratory Tests ^A	Group Symbo	Group Name ^B
Coarse-Grained Soils	Gravels	Clean Gravels	$Cu \ge 4$ and $1 \le Cc \le 3^E$	GW	well-graded GRAVEL ^F
More than 50%	More than 50% of coarse	Less than 5% fines ^C	$Cu < 4$ and/or $1 > Cc > 3^E$	GP	poorly graded GRAVEL ^F
retained on No. 200	fraction retained on No. 4	Gravels with Fines	Fines classify as ML or MH	GM	silty GRAVEL ^{F,G,H}
sieve	sieve	More than 12 % fines ^C	Fines classify as CL or CH	GC	clayey GRAVEL ^{F,G,H}
	Sands	Clean Sands	$Cu \ge 6 \text{ and } 1 \le Cc \le 3^E$	SW	well-graded SAND ¹
	50 % or more of coarse	Less than 5 % fines ^D	$Cu < 6$ and/or $1 > Cc > 3^E$	SP	poorly graded SAND ¹
	fraction passes No. 4	Sands with Fines	Fines classify as ML or MH	SM	silty SAND ^{G,H,I}
	sieve	More than 12 % fines ^D	Fines classify as CL or CH	SC	clayey SAND ^{G,H,I}
Fine-Grained Soils	Silts and Clays	inorganic	PI > 7 and plots on or above "A	" line ^J CL	lean CLAY ^{K,L,M}
50 % or more passes	Liquid limit less than 50		PI < 4 or plots below "A" line ^J	ML	SILT ^{K,L,M}
the No. 200 sieve		organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.7$	5 OL	organic CLAY ^{<i>K</i>,<i>L</i>,<i>M</i>,<i>N</i>} organic SILT ^{<i>K</i>,<i>L</i>,<i>M</i>,<i>O</i>}
	Silts and Clays	inorganic	PI plots on or above "A" line	СН	fat CLAY ^{K,L,M}
	Liquid limit 50 or more	U	PI plots below "A" line	MH	elastic SILT ^{K.L.M}
		organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.7$	5 OH	organic CLAY ^{<i>K,L,M,P</i>} organic SILT ^{<i>K,L,M,Q</i>}
Highly Organic Soils	Primarily	organic matter, dark in	color, and organic odor	РТ	PEAT
 ^A Based on the material passing the 3-in. (75mm) sieve. ^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name. ^C Gravels with 5 to 12 % fines require dual symbols: GW-GM well-graded GRAVEL with silt GW-GC well-graded GRAVEL with clay GP-GM poorly graded GRAVEL with clay GP-GC poorly graded GRAVEL with clay ^D Sand with 5 to 12 % fines require dual symbols: SW-SM well-graded SAND with silt 		$E Cu = D_{60} / D_{10}$ $F If soil containsto group name.$ $G If fines classify$	$Cc = (D_{30})^2 / (D_{10} \times D_{60})$ $Sc \ge 15 \% \text{ sand, add "with sand"}$ $Cc = (D_{30})^2 / (D_{10} \times D_{60})$ $Cc = (D_{10})^2 / (D_{10} \times D_{60})$ $Cc = (D_{10})^2 / (D_{10} \times D_{60})$ $Cc = (D_{10})^2 / (D_{10} \times D_$		ains ≥ 30 % plus No. 200, ttly sand, add "sandy" to tins ≥ 30 % plus No. 200, ttly gravel, add "gravelly"
		bols: <i>H</i> If fines are orgound for group name. <i>It I</i> If soil contains ay gravel" to group	anic, add "with organic fines" ≥ 15 % gravel, add "with p name.	to group native to group native for a first to group native $P I \ge 4$ and p $P I < 4$ or p $I P I$ P P P I plots on P	me. blots on or above "A" line. ots below "A" line. or above "A" line.
		s: ^J If Atterberg lin is a CL-ML, s	^J If Atterberg limits plot in hatched area, soil ^Q F is a CL-ML, silty CLAY.		PI plots below "A" line.

"Some" indicates presence of negligible amount of material.

RELATIVE DENSITY AND CONSISTENCY TABLE

^K If soil contains 15 to 29 % plus No. 200, add

"with sand" or "with gravel," whichever is

The Standard Penetration Resistance values (N-values) and DCP values are used to describe the relative density of coarse-grained soils and the consistency of fine-grained soils as follows:

predominant.

well-graded SAND with clay

poorly graded SAND with silt

poorly graded SAND with clay

SW-SC

SP-SM

SP-SC

<u>Coh</u>	esionless Soil		<u>Cc</u>	hesive Soil	
N-value	<u>DCP</u>	Term	N-value	DCP	<u>Term</u>
0 - 5 6 - 20	0 - 4 5 - 20	Loose Firm	0 - 5 6 - 9	0 - 4 5 - 9	Soft Medium Stiff
21 - 30 31+	21+	Compact Very Compact	10 - 15 16 - 30 31+	10 - 20 21+	Stiff Very Stiff Hard

GEOTECH ENGINEERS, INC.

Soil Laboratory Test Summary

	Cladat		bera I	imits	Specific	Moisture	
Boring No. (Depth)	ASTM D 2487 LL PL PI		PI	Gravity, G _s	Content, %	Passing #200, %	
B-25 (2.5')	-	-	-	-	-	21.1	-
B-25 (5.0')	lean CLAY with sand (CL)	31.9	20.6	11.3	-	19.4	81.4
B-25 (8.5')	lean CLAY (CL)	33.6	20.4	13.2	-	22.8	85.2
B-25 (13.5')	-	-	-	-	-	22.7	-
B-25 (18.5')	-	-	-	-	-	27.5	-
B-25 (23.5')	-	-	-	-	-	21.9	-
B-25 (28.5')	-	-	-	-	-	19.1	-
B-28 (2.5')	-	-	-	-	-	21.7	-
B-28 (5.0')	lean CLAY (CL)	29.5	19.7	9.8	-	21.2	93.5
B-28 (8.5')	-	-	-	-	-	22.0	-
B-28 (13.5')	-	-	-	-	-	19.3	-
B-28 (18.5')	-	-	-	-	-	11.9	-
B-28 (23.5')	poorly graded SAND with silt (SP-SM)	NP	-	-	-	3.3	8.3
B-28 (28.5')	-	-	-	-	-	4.2	-

Gradation Test Reports (6)

Moisture-Density Test Report (2) California Bearing Ratio(CBR) Test Report (1)

Boring No.	Moisture-Den (ASTI	sity Relation Test M D-1557)	CBR		
(Depth)	Maximum Dry Density (pcf)	Optimum Moisture Contents (%)	Corrected CBR	Swelling (%)	
B-2 (0.0-5.0')	123.3	10.8	1.2	9.86	
B-14 (0.0-5.0')	115.8	12.5	2.0	7.81	















GEOTECH ENGINEERS, INC.







Appendix D

Infiltration Test Reports

Holes SWM-1 to SWM-6

Hole Preparation and Testing Procedures:

- a. A 6-inch diameter borehole was prepared to the designated depth or 2 ft above the groundwater level.
- b. A 4-inch diameter solid PVC casing was inserted and the borehole was presoaked overnight.
- c. On the next day, the hole was refilled with water to 24 inches from the bottom.
- d. Water levels in the pipe were monitored at every 30 min for 4 hours.

GEOTECH ENGINEERS, INC.

PROJECT NAME:	Lansdowne Elementary School	PROJECT NO:	362216
LOCATION:	2301 Alma Road, Baltimore, MD	HOLE NO:	SWM-1A
PIPE DIAMETER:	4"	HOLE DEPTH:	14.0'
PRE-SOAKING DATE:	3/14/2016	TEST DATE:	3/15/2016

(reading accuracy: 1/16")

TIME	TIME WATER LEVEL ELAPSED BELOW REFERENCE		DROP IN LEVEL	INFILTRATION RATE	REMARKS	
	min.	ft	in	in	in/hr	
12:15	0		10 1/2			
12:45	30		10 1/2	0	0.00	
13:15	60		10 1/2	0	0.00	
13:45	90		10 1/2	0	0.00	
14:15	120		10 1/2	0	0.00	
14:45	150		10 1/2	0	0.00	
15:15	180		10 1/2	0	0.00	
15:45	210		10 1/2	0	0.00	
16:15	240		10 1/2	0	0.00	

Remarks:

Recommended Infiltration Rate:

0.00 in/hr

Performed by:

Wesley J.

GEOTECH ENGINEERS, INC.

PROJECT NAME:	Lansdowne Elementary School	PROJECT NO:	362216
LOCATION:	2301 Alma Road, Baltimore, MD	HOLE NO:	SWM-2A
PIPE DIAMETER:	4"	HOLE DEPTH:	7.0'
PRE-SOAKING DATE:	3/14/2016	TEST DATE:	3/15/2016

(reading accuracy: 1/16")

TIME	TIME WATER L ELAPSED REF		R LEVEL BELOW EFERENCE	DROP IN LEVEL	INFILTRATION RATE	REMARKS
	min.	ft	in	in	in/hr	
12:13	0		28 1/2			
12:43	30		28 1/2	0	0.00	
13:13	60		28 1/2	0	0.00	
13:43	90		28 1/2	0	0.00	
14:13	120		28 1/2	0	0.00	
14:43	150		28 1/2	0	0.00	
15:13	180		28 1/2	0	0.00	
15:43	210		28 1/2	0	0.00	
16:13	240		28 1/2	0	0.00	

Remarks:

Recommended Infiltration Rate:

0.00 in/hr

GEOTECH ENGINEERS, INC.

PROJECT NAME:	Lansdowne Elementary School	PROJECT NO:	362216
LOCATION:	2301 Alma Road, Baltimore, MD	HOLE NO:	SWM-3A
PIPE DIAMETER:	4"	HOLE DEPTH:	7.0'
PRE-SOAKING DATE:	3/14/2016	TEST DATE:	3/15/2016

(reading accuracy: 1/16")

TIME	TIME ELAPSED	WATE BELOW R	R LEVEL EFERENCE	DROP IN LEVEL	INFILTRATION RATE	REMARKS
	min.	ft	in	in	in/hr	
12:07	0		33			
12:37	30		33	0	0.00	
13:07	60		33	0	0.00	
13:37	90		33	0	0.00	
14:07	120		33	0	0.00	
14:37	150		33	0	0.00	
15:07	180		33	0	0.00	
15:37	210		33	0	0.00	
16:07	240		33	0	0.00	

Remarks:

Recommended Infiltration Rate:

0.00 in/hr

GEOTECH ENGINEERS, INC.

PROJECT NAME:	Lansdowne Elementary School	PROJECT NO:	362216
LOCATION:	2301 Alma Road, Baltimore, MD	HOLE NO:	SWM-4A
PIPE DIAMETER:	4"	HOLE DEPTH:	7.0'
PRE-SOAKING DATE:	3/14/2016	TEST DATE:	3/15/2016

						(reading accuracy: 1/16")
TIME	TIME ELAPSED	WATEF R	R LEVEL BELOW EFERENCE	DROP IN LEVEL	INFILTRATION RATE	REMARKS
	min.	ft	in	in	in/hr	
12:00	0		11 5/8			
12:30	30		11 5/8	0	0.00	
13:00	60		11 5/8	0	0.00	
13:30	90		11 5/8	0	0.00	
14:00	120		11 5/8	0	0.00	
14:30	150		11 5/8	0	0.00	
15:00	180		11 5/8	0	0.00	
15:30	210		11 5/8	0	0.00	
16:00	240		11 5/8	0	0.00	

Remarks:

Recommended Infiltration Rate:

0.00 in/hr

INFILTRATION TEST REPORT GEOTECH ENGINEERS, INC.

PROJECT NAME:	Lansdowne Elementary School	PROJECT NO:	362216
LOCATION:	2301 Alma Road, Baltimore, MD	HOLE NO:	SWM-5A
PIPE DIAMETER:	4"	HOLE DEPTH:	7.0'
PRE-SOAKING DATE:	3/14/2016	TEST DATE:	3/15/2016

						(reading accuracy: 1/16")
TIME	TIME ELAPSED	WATEF R	R LEVEL BELOW EFERENCE	DROP IN LEVEL	INFILTRATION RATE	REMARKS
	min.	ft	in	in	in/hr	
11:55	0		46 5/8			
12:25	30		46 5/8	0	0.00	
12:55	60		46 5/8	0	0.00	
13:25	90		46 5/8	0	0.00	
13:55	120		46 5/8	0	0.00	
14:25	150		46 5/8	0	0.00	
14:55	180		46 5/8	0	0.00	
15:25	210		46 5/8	0	0.00	
15:55	240		46 5/8	0	0.00	

Remarks:

Recommended Infiltration Rate:

0.00 in/hr

INFILTRATION TEST REPORT GEOTECH ENGINEERS, INC.

PROJECT NAME:	Lansdowne Elementary School 2301 Alma Road, Baltimore,	PROJECT NO:	362216
LOCATION:	MD 4	HOLE NO:	SWM-6A
PIPE DIAMETER:	"	HOLE DEPTH:	2.0'
PRE-SOAKING DATE:	3/14/2016	TEST DATE:	3/15/2016

(reading accuracy: 1/16")

TIME	TIME ELAPSED	WAT BELOW	ER LEVEL REFERENCE	DROP IN LEVEL	INFILTRATION RATE	REMARKS
	min.	ft	in	in	in/hr	
12:00	0		11			
12:30	30		11	0	0.00	
13:00	60		11	0	0.00	
13:30	90		11	0	0.00	
14:00	120		11	0	0.00	
14:30	150		11	0	0.00	
15:00	180		11	0	0.00	
15:30	210		11	0	0.00	
16:00	240		11	0	0.00	

Remarks:

Recommended Infiltration Rate:

0.00 in/hr

APPENDIX E



GEOTECH ENGINEERS, INC.

Appendix F

General Soil Profiles Profile 1, 2, 3 and 4

- 1. Distance between the borings shown on the profiles is approximate. Actual offset distances are included in the boring logs.
- 2. The generalized soil profiles are our interpretation of the test boring data and should not be used as a part of the contract documents.
- 3. See Attachment E for soil profile lines.









TEST BORING REPORT

Boring Logs, B-1 to B-40 and SMW-1 to SMW-8 Boring Location Plan

1. <u>Test Borings</u>

The test borings were drilled by a hollow stem auger. The standard penetration tests (SPT's) were performed at the depths shown on the boring logs. The auger was advanced to the desired depth and standard penetration test was performed after plug was removed. An automatic hammer was used for SPT's.

2. Boring Survey

Boring stakeout and elevation survey were provided by Grimm and Parker Architects.

3. <u>General Notes</u>

- a. Numbers in "blow count" column indicate blows required to drive a 2 inch O.D., 1-3/8 inch I.D. sampling spoon through 6 inch intervals or as indicated, using a 140 lb hammer falling 30 inches, according to ASTM D-1586.
- b. Groundwater levels shown on the logs are estimated from the available data and may vary with precipitation, porosity of the soil, site topography, etc.
- c. The boring logs and related information depict subsurface conditions only at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at these boring locations.
- d. The stratification lines represent the approximate boundary between soil and rock types as determined from the drilling and sampling operation. Some variation may also be expected vertically between samples taken. The soil profile, water level observations and penetration resistance presented on these boring logs have been made with reasonable care and accuracy, and must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.
- e. Soil samples were classified according to ASTM D-2487.

f. WOH: Weight of hammer GS: Ground Surface

		PROJECT: Lansdowne Elementary Scho	ol					_ PRO	JECT	NO.: _	:	362216	
GEOTEC	СН	CLIENT: Grimm and Parker											
ENGINE	ËRS,	PROJECT LOCATION: 2301 Alma Road	, Baltimo	ore, M	D								
INC.	·	LOCATION: see boring location plan						_ ELE	VATIC	N:		157	
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INC.		·	LOCATION: see boring location plan						_ ELI	EVATIO	оn:		152	
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INC.	,	LOCATION: see boring location plan						_ ELE	EVATIO	DN:	1	50.5	
		DRILLER: Recon Drilling, Inc.			_ LO	GGED	BY:		JP				
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100			DRILLER: Recon Drilling, Inc.						LOGG	ED B	Y:		JP	
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155 -	-	Brown san	dy lean CLAY (CL), moist					8 16				· · · · · · · · ·	•	
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		Dark brown	n sandy SILT (ML), moist		T			8 9		20 /	/			5
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150 -	-							4	13 /	\langle				
								5 8		•••••		:		
	- 10		Boring terminated at 10 ft.				1		•••••	:				10 -
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145 -										•••••				
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	- 15									•••••		:		15 -
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130 -														
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125 -	-								÷	÷		: :		÷
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	- 35													35 -
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		PROJECT: Lansdowne Elementary S	chool				PROJEC	T NO.:	3622	216
GEOTEC	CH	CLIENT: Grimm and Parker						_		
ĔŇĞİNĒ	ËRS.	PROJECT LOCATION: 2301 Alma R	oad, Baltim	ore, M	D					
INC.	,	LOCATION: see boring location plan					_ ELEVAT	ION:	154	
		DRILLER: Recon Drilling, Inc.) BY:	JP	
		DRILLING METHOD: Hollow Stem Au	uger					_ DATE:	3-1	4-16
NO. 6	-5	DEPTH TO - WATER> INITIAL: ₩	dry .	AFTE	R 24 H	iours: 🐺	dry	_ CAVIN	G>	6.0'
ion ط				jc	Ę	ts ^v /hr		TEST RE	SULTS	
evat & Dept (feet		Description		raph	tratu	iltrat te, ir Blov	Plastic Lim	it		iquid Limit
<u> </u>				G	Ś	Ra	Penetratio	נפות- ≁ ז- ∆		
— 0							10 4	20 30	40	50
_	2" topsoil	dy lean aloy (FILL) moist				4	10			0
_	- contains	roots								
_ ·			2.5			4	16 🍐			
150 -	Dark brown	h sandy lean CLAY (CL), moist				9				
							15			5 -
	~					6				, , , , , , , , , , , , , , , , , , ,
_						9				
_										
145 —						4	16 🛆			
- 10						9				10 -
		Boring terminated at 10 ft.								10
							:			
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140										:
140 -										15
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130 -										
- 25									••••••••••	25 -
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125 —										
- 30										30 -
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120 -										
— 35										35 -
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		PROJECT: Lansdowne Elementary S	chool					_ PRO	JECT	NO.:	3	362216	
GEOTE	СН	CLIENT: Grimm and Parker											
ĔŇĠĬŇĔ	ËËRS,	PROJECT LOCATION: 2301 Alma R	oad, Baltim	ore, M	ID								
INC.	-	LOCATION: see boring location plan						_ ELE	VATIO	N:		153	
		DRILLER: Recon Drilling, Inc.						_ LOG	GED I	BY:		JP	
		DRILLING METHOD: Hollow Stem Au	uger				-			DATE	::	3-9-16	3
110.1		DEPTH TO - WATER> INITIAL: 👙	dry	AFTE	R 24 F		: ¥	(dry	CAVI	NG> _	<u> </u>	ô.0'
th tion				hic	Ę	ttion in/hr	v hts	Diantin	l Limit	ESTR	ESULI	<u>'S</u>	-1 : mit
leva & Dep (fee		Description		Grap	Strat	filtra ate, i	Cour	Water	Conte	ent-≯	 *	Llqui	
Ш					0,	느꼈		Penetr	ation -	- Δ			
\perp o	2" topsoil						2	<u>10</u>) 2	20 3	<u>i0 4</u>	10 5	<u>;0</u> 0
+	Z topson Brown san	dy lean clay (FILL) moist					3 4				: :	÷	
+	- contains	roots							.		:		
150 —	Brown san	 dv.lean.CLAY.(CL).moist	2.5				4 5	12	7		••••••		
+	Diowirioun			V///			7				••••••		
- 5			5.0				4	1.	4 Á				5 -
+ -	Brown fat u	CLAY with sand (CH), moist					6 8				••••••		
+										\			
145 —			0.5							~~~			
+	Brown san	dy lean CLAY (CL), moist	8.5				8 11			27 △			
- 10		Paring terminated at 10 ft				-	16						10 -
+		Boring terminated at 10 ft.										÷	
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130 —											:	÷	
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			PROJECT: Lansdowne Elementary School	bl					PR	OJECT	NO.:	3	62216	
GEO	TFC	ЭН	CLIENT: Grimm and Parker								-			
ĔŇĞ	INE	ËRS.	PROJECT LOCATION: 2301 Alma Road,	Baltimore	e, Ml	D								
INC.		,	LOCATION: see boring location plan						_ ELE	EVATIC	N:	15	52.5	
			DRILLER: Recon Drilling, Inc.						_ LO	GGED	BY:		JP	
LOG			DRILLING METHOD: Hollow Stem Auger								DATE	::	3-9-16	;
	INO. E	D - <i>1</i>	DEPTH TO - WATER> INITIAL : \neq <u>5</u>	.0' AF	TER	24	IOUR	S: ₹		2.5'	CAVI	NG> 🤇	<u> </u>	5.4'
h tion	t)				ic.	Ę	tion n/hr	ts <		Τ	EST R	ESULT	<u>s</u>	
evat & Dent	(feel		Description		irapl	itratu	filtra ite, i	Blov	Plast	ic Limit r Conte	ent- ≯		Liquic	1 Limit
Ξ					0	0	E S		Pene	tration	- A			
	_ 0	0" to a c il		k	<u>~~</u>			4		10 2	20 3	0 4	0 5	0
	-	2" topsoli Brown san	dv lean clav (Ell I.) moist	X	*			5 4	[/ [*]	<u>}</u>				
	-	- contains	s roots	× ×	*				/					:
150 -				×	*			2	4 4	: 			:	:
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	-5	74		Ŕ	*			1	54	: 			:	5 -
		~		×	*			2 3		: 			:	:
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145 -	-			× ×	***				\				:	
	-	Grav and b	prown sandy lean CLAY (CL) moist	8.5	\widetilde{Z}			3 4	10	À				:
	- 10				<u>//</u> 4		-	6		:			:	10 -
	-		Boring terminated at 10 ft.											
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120 -	-									•••••••				
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	- 35									•				35 -
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Bag sa	mple we	as taken at 0 ft	t to 5 ft.											

		PROJECT: Lansdowne Elementary	School					_ PRO	JECT	NO.: _	3	62216	
GEOTEC	СН	CLIENT: Grimm and Parker											
ĔŇĞĬŇĔ	ËRS.	PROJECT LOCATION: 2301 Alma F	Road, Baltime	ore, M	ID								
INC.	,	LOCATION: see boring location plan	۱					_ ELEV	ΑΤΙΟ	N:	1	54	
		DRILLER: Recon Drilling, Inc.						LOG	GED E	BY:		JP	
		DRILLING METHOD: Hollow Stem A	luger							DATE	÷	3-15-10	6
NO. E	0-0	DEPTH TO - WATER> INITIAL: ₩	dryA	FTE	R 24 H	HOURS	S: ₹			CAVI	NG> 🤇	<u> </u>	
				ic	ε	ion /hr	's		Т	EST R	ESULT	S	
evati & Deptl feet		Description		raph	tratu	ltrat te, ir	Blow	Plastic	Limit			Liquio	d Limit
				G	N N	Infi Rat	- 0	Penetra	ation -	nu- * ∴∆	c.		
-								10	2	03	0 4	0 5	0
	3" topsoil						2 3	7					0
	Brown san	dy lean clay (FILL), moist					4				•		
			2.5				3	74					:
150	_ Dark brown	n fat CLAY (CH), moist	36				4 3						:
130	Reddish br	rown silty SAND (SM), moist	0.0								:	: :	
- 5							5 5	112	<u>.</u>				5-
-							6						:
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+							7	13	Y		• • • • • • • •	• • • • •	:
145 —							7				• • • • • • • •	•	:
- 10		Boring terminated at 10 ft.				1	-						10 -
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140 —												•	
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Backfilled on a	completion												

GEOTECH			PROJECT: Lansdowne Elementary School						_ PROJEC	PROJECT NO.:			362216	
		ЭН	CLIENT: Grimm and Parker											
ĔŊĞ	ÍNE	ËRS,	PROJECT LOCATION: 2301 Alma Road, Baltimore, MD											
INC.		•	LOCATION: see boring location plan							ELEVATION:			149	
			DRILLER: Recon Drilling, Inc.						LOGGED BY:			JP		
No. B-9												3-9-16		
			DEPTH TO - WATER> INITIAL: ≆ AFTER 24 HOUR): ≑	ury				<u> </u>		
:levation & Depth (feet)		bhic bhic bhic bhic bhic bhic bhic bhic					w Ints	Plastic L in	nit —		5 Liquid	d Limit		
									Water Cor	ntent -	*	1		
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T	- 0	Brown san	dv lean clav (FILL), moist		***			2	4		<u>50 4</u>	0 5	0	
-	-	- contains	roots					2	···· \····					
+	-							4	10					
+	-							5 5			•••••	• • • • • • •		
145 -	-									•••••••••••••••••••••••••••••••••••••••	:	•••••	:	
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+	-							7	· · · · · · · · · · · · · · · · · · ·	•	:	•		
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140	-				5' 🚧			3	15 🛆	•		•		
140 -	_ 10	Dark gray s	sandy lean CLAY (CL), moist					6 9				•	10	
			Boring terminated at 10 ft.								•	•	10	
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135 -	_								:		•		:	
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125 —	-											•	· · · · · · -	
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	- 30										•••••	•••••	30 -	
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115 —	-										•••••	••••••		
+	- 35									•••••••••••••••••••••••••••••••••••••••	•••••	••••••	35 -	
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		PROJECT: Lansdowne Elementary Se	chool					_ PRC	JECT	NO.:	;	362216		
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GEOTE	СН	CLIENT: Grimm and Parker												
ĔŇĞĺŇĒ	ERS,	PROJECT LOCATION: 2301 Alma Ro	oad, Baltim	nore, M	ID									
INC.		LOCATION: see boring location plan						_ ELE	VATIO	DN:		153		
	BORING	DRILLER: Recon Drilling, Inc.							GED	BY: _		_JP		
		DRILLING METHOD: Hollow Stem Au	iger							DATI	E:	3-15-1	6	
NO. L	-10	DEPTH TO - WATER> INITIAL: ¥	dry		R 24 F		S: ₹			CAV	NG>	• <u> </u>		
tion				hic	Ę	tion n/hr	nts v	D I ()	T	EST R	ESUL	TS		
levat & Dept (fee		Description		brap	stratu	filtra ate, i	Blo	Plastic Water	c Limit · Conte	ent-⇒	*	- Liquid	d Limit	
Ξ				0	<u> </u>	E S		Penet	ration	- A				
⊤ 0	Description						3	1 	0 2	20 3	30	40 5	<u>50</u>	
_	Brown san	dy lean clay (FILL), moist					3	\land		:	:			
+		10013								:	: 		÷	
150 —	Brown san	udv lean CLAY (CL) moist	2.5	⁵ 777			5 5	12	7	• • • • • • • •			: :	
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- 5							2	10 /	<u>.</u>		: :		5 -	
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145 —											:			
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- 10							9			•	•		10	
1.0		Boring terminated at 10 ft.								:	:		10	
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Backfilled on	completion													

	PROJECT NO.: 362216						216		
GEOTEC	ЭН	CLIENT: Grimm and Parker							
ĔŇĞĬŇĔ	ËRS.	PROJECT LOCATION: 2301 Alma Road, Balti	more, N	/ID					
INC.	,	LOCATION: see boring location plan				ELEVA		156	6
		DRILLER: Recon Drilling, Inc.					D BY:	JF	
		DRILLING METHOD: Hollow Stem Auger					DATE	:3-	16-16
NO. В [.]	-11	DEPTH TO - WATER> INITIAL: ₩dry	AFTE	R 24 I	Hours: 🐺	dry		NG>	25.7'
			<u>.</u>	E	s /hr		TEST R	ESULTS	
evati & Depth feet		Description	raph	ratu	Itrati ie, ir 3low ount	Plastic Li	nit 🔶	I	_iquid Limit
			Ū	l <u>v</u>	C Bat	Penetrati	ntent-≯ on-∆	<	
— 0						10	20 3	0 40	50
155 -	1" topsoil E	Brown sandy lean clay (FILL), moist		A	3	7		• • • • • • • • • • •	0
100					4			· · · · · · · · · · · · · · · · · · ·	
	D	2	.5'	В	3	84		: :	÷
	Brown san	dy lean CLAY (CL), moist		1	4 4		÷		
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150 -					7	:	\backslash	:	
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+		8	.5'		9		25 4	• • • • • • • • • •	
+	Light gray	and light brown silty SAND (SM), moist			10 15				
- 10							:::::::::::::::::::::::::::::::::::::::		10 -
145 —							······		
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+					11			44	Δ
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125 —		Boring terminated at 30 ft.							
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120								• • • • • • • • • •	
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		PROJECT: Lansdowne Elementary S	School					_ PRC	JECT	NO.: _	3	62216	
GEOTEC	СН	CLIENT: Grimm and Parker											
ĔŇĞĬŇĒ	ËRS,	PROJECT LOCATION: 2301 Alma F	oad, Baltimo	ore, M	ID								
INC.	•	RING LOCATION: see boring location plan DRILLER: Recon Drilling, Inc. DRILLING METHOD: Hollow Stem Auger									1	56	
		DRILLER: <u>Recon Drilling</u> , Inc.						_ LOG	GED	BY:		JP	
	-12	DRILLING METHOD: Hollow Stem A	uger							DATE	: <u>3-16-16</u>		6
NO. B	12	DEPTH TO - WATER> INITIAL: 😤	dry		R 24 F		i: ÷		dry _		NG> (<u> </u>	5.0
ttion th				hic	Ę	ation in/hr	v v stc	Diactic	limit	ESTRI	ESULI	S	d Limit
leva & Dep (fee		Description		Grap	Strat	filtra ate, i	Cour	Water	Conte	ent- *	<	Liquid	
ш				Ľ		⊆ ữ		Penet	ration	- 🛆			
⊤ ⁰	2" tonsoil				В	-	3	1 	0 2	<u>20 3</u>	0 4	0 5	0
155 —	Brown san	dy lean CLAY (CL), moist		V//			3 4	'\			• • • • • • • •	•	
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+	Light gray	silty SAND (SM), moist			С		14 18						
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_											•		
+							20					48	
- 25	~ ~						26						25 -
130 —												/	:
+										÷	•	: /	
-											•	:/	
-							14 18			<u>.</u>	40 4	;	:
— 30		D. 1. 4. 1. 4.20 C				-	22						30 -
125 —		Boring terminated at 30 ft.								••••••	•	•	
+										÷	:	:	:
+										÷	• • • • • • • • •		:
+													
- 35												••••••	35 -
120 -										: :	:	:	:
1						<u> </u>							

		PROJECT: Lansdowne Elementary S	chool					_ PROJECT NO.:	3622	16
GEOTE	СН	CLIENT: Grimm and Parker								
ĔŇĞİŇĪ	EËRS.	PROJECT LOCATION: 2301 Alma R	oad, Baltimo	ore, M	D					
INC.	,	LOCATION: see boring location plan						ELEVATION:	156	
		DRILLER: Recon Drilling, Inc.						LOGGED BY:	JP	
LOGOF	BORING	DRILLING METHOD: Hollow Stem Au	uger					DATE:	3-2	1-16
NO. I	8-13	DEPTH TO - WATER> INITIAL: 礕	dryA	FTEF	R 24 H	HOUR	S: ₹	dryCAVIN	IG> _C	26.0'
ц				υ	c	r r		TEST RE	SULTS	
Elevatic & Depth (feet)		Description		Graphi	Stratun	Infiltratio Rate, in/	Blow Counts	Plastic Limit Water Content - Penetration - △	——— Li	quid Limit
⊤ 0	4" +=====					-	3	<u>10 20 30</u> 국) 40	50
155 —	Brown san	dy lean CLAY (CL) moist			Б		3			
+	Diowirisan									
1	- with gra	vel at 2.5'					4	15 4		
_	_						9			
- 5				V / A				26		5
150				$V\!/\!A$			9 10	207	:	, J
150							16		÷	
Ť									:	:
Ť							11	28 4		
Ť							13 15			
- 10									:	10 -
145 —				V / A						
+				V / A					\	
+				V / A					·	
+							12 14	33		
- 15							19		···· ÷ `	15 -
140 -										
+										
1										
_	Light grov	and light brown ailty SAND (SM)			С		19			∆85 →
- 20		and light brown sitty SAND (SW)), moist				35 50			20 -
125	- Ironite a	at 18.5' to 23.5'							:	20
135									÷	÷
T										
Ť							29			∆69 →
Ť							34 35		• • • • • • • • • • • • • • • • • • • •	
+ 25	4								·····	25
130	¥-								•••••••	/
+									·····	· · · · · · · · · · · · ·
+								32		
+							14			
- 30		Paring terminated at 20 ft				-	17			30 -
125 —		Bornig terminated at 50 ft.								
+										
+										
1									:	
- 35										35 -
120 -										
120									:	:

		PROJECT: Lansdowne Elementary S	School				PROJECT	「 NO.: _	3622	216
GEOTEC	СН	CLIENT: Grimm and Parker								
ĔŇĞİŇĔ	ËRS.	PROJECT LOCATION: 2301 Alma R	oad, Baltimo	ore, M	D					
INC.	,	LOCATION: see boring location plan					ELEVATI	ON:	153	
		DRILLER: Recon Drilling, Inc.					LOGGED	вү:	JP	
	ORING	DRILLING METHOD: Hollow Stem A	uger					DATE:	3-2	21-16
No. B	-14	DEPTH TO - WATER> INITIAL: 🐺	dry	FTE	R 24 H	Hours: 🐺	dry		G> <u>C</u>	26.0'
L.				с	c	드느	-	TEST RE	SULTS	
Elevatic & Depth (feet)		Description		Graphi	Stratun	Infiltratic Rate, in/ Blow Counts	Plastic Limi Water Cont Penetration	t	—— L	iquid Limit
— 0	0" to a sil			××××	۸	3	<u>10</u>	<u>20 30</u>	40	50
+	Z topsoli Brown san	dy silt (FILL) moist			A	3	6			
+	Drown San									
150 -						2	64	<u>.</u>		
_						3				
- 5							15			5
5	Brown san	dy lean CLAY (CL), moist	5.0		В	4 6		: :		5
T						9		: :	÷	
Ť										
145 —						4	94	•	• • • • • • • • • •	
Ť						4				
- 10							·····	:	• • • • • • • • •	10 -
+										
+								÷		
140 +								÷		
+						6 7	16 4	÷		
- 15						9	\			15 -
1								\	· · · · · · · · · · · · · · · · · · ·	
_										
125										
135	_				C	9	:	23 2	÷	:
Ť	Brown san	dy SILT (ML), moist			U	10 13				
- 20								/		20 -
+								:	\backslash	
Ť								:	···· \	
130 -									42	
+	Light brow	n silty SAND (SM), moist	20.0			14		÷•••••••••••••••••••••••••••••••••••••		
- 25	_					20				25 -
+ -4									/	
+										
125 —										
-						10 10	2'			
- 30						11		:;	.	30 -
		Boring terminated at 30 ft.								
								÷		
120							l :	:	:	÷
120								:	:	
Ť								:	•	
- 35								:	· · · · · · · · · · · · · · · · · · ·	35 -
+							<u> </u>	<u>:</u>	<u> </u>	

	GFOTFCH CLIENT: Grimm and Parker							_ PROJECT NO.: _	362216	
GEO	TEC	CLIENT: Grimm and Parker								
ĔÑĞ	INE	ËRS,	PROJECT LOCATION: 2301 Alma Road, Baltim	ore, M	ID					
INC.		,	LOCATION: see boring location plan					ELEVATION:	148.5	
			DRILLER: Recon Drilling, Inc.					LOGGED BY:	JP	
LUG			DRILLING METHOD: Hollow Stem Auger					DATE:	3-15-1	6
	чо. D	-15	DEPTH TO - WATER> INITIAL: ♀ dry	AFTE	R 24 I	HOURS	: ₹		G> <u>C</u>	
h io				jc	Ξ	/hr	ts <	TEST RE	SULTS	
Elevat & Dept	(feet		Description	Graph	Stratu	Infiltrat Rate, ir	Coun	Plastic Limit ⊢ Water Content - ★ Penetration - △	—— Liquid	d Limit
	_ 0	0				-	3	<u>10 20 30</u>	40 5	0
-	- - -	Brown san	dy lean clay (FILL), moist roots		Å		3	11		
145 -	-	Brown to d	ark brown sandy lean CLAY (CL), moist		В		4 6 5			
-	- 5						4	114		5 -
-	-						4 7			:
-	-									
140 -	-						_	28		
140	- Ignite below 9.0'						8 14 14			
-							14		• • • • • • • • • • • • • • • • • • • •	10 -
-	-								· · · · · · · · · · · · · · · · · · ·	
135 -	135 —						10	24 🗸	• • • • • • • • • • • • • • • • • • • •	
-	-						10 14		• • • • • • • • • • • • • • • • • • • •	
	- 15	15							15 -	
-	-									
-	-									
130 -	-	Auger refu	sal at 19.0'						50/0	
-			Boring terminated at 19 ft.	╢]	50/0		50/0 4	2 20 -
	_ 20									20 -
-	_									
	-									
125 -	-									
	- 25									25 -
-										
-	-									
-	-									
120 -	-									
-	- 30									30 -
-	-									
-	-									
-	-									
115 -	-									:
-	- 35									35 -
-	+ -									
-	-				I			<u> </u>		<u>.</u>

			PROJECT: Lansdowne Elementary S	School				PROJEC	T NO.:	36	2216	
GEOT	ΈC	Н	CLIENT: Grimm and Parker									
ĔŇĞİ	NĔ Ĕ	ĖRS,	PROJECT LOCATION: 2301 Alma R	oad, Baltim	nore, M	ID						
INC.	-		LOCATION: see boring location plan					ELEVAT	ON:	15	56	
			DRILLER: Recon Drilling, Inc.						BY:	J	IP	
Nc		16	DRILLING METHOD: Hollow Stem A	uger					_ DATE	E: <u>3</u>	<u>i-11-16</u>	3
	ים . י	10	DEPTH TO - WATER> INITIAL: ¥	dry	AFTE	R 24 H	HOURS: 😤	dry	_ CAVI	NG> 🗘	18	8.0'
tion					hic	Ę	w M		TEST R	ESULTS	3	
levat & Depi (fee			Description		jrap!	itratu	filtra Ite, i Blo	Plastic Lim	it	 *	Liquia	I Limit
Ξ					0	0)	Ra	Penetratior	η-Δ			
τı	₀⊢	<u></u>						<u>10</u> 구	20 3	<u>30 40</u>) 50	0
155 —		2" topsoli Brown san	dy loop day (Ell.L.) moist			А		6				Ŭ.
+		- contains	rock fragments					 				
+	F			2.8	5 <i>V///</i>	В		7				
1		Brown san	dy lean CLAY (CL), moist		V///		3	\				
	<u>_</u>				V///					;		5 -
150 -					V//					:	•	Ĵ
120					V///		8			:	:	
Ť					V//			1	\sim	<	:	:
Ť					V///			····	•	36 4	:	
†	L			97	, <u>///</u>		14		• • • • • • • • • •		• • • • • • •	
+ :	10	Gray silty S	SAND (SM), moist	5.1	′	С			:	····· /		10 -
145 —											$\langle \cdot \cdot \cdot \rangle$	· · · · · · · · ·
+										::		
+											10	
+							14 22			:	48	
+ :	15						26					15 -
140 -										: 	/	
+											./	:
1	¢	_									/	:
1							9			41 🖄	Ĺ	
	20						27			: :		20 -
125	20									: 		~~
135												Ņ
T								:		:	:	•••••
Ť	\vdash			23.5	5'		20	1 :	•	:	:	∆71 →
Ť		Light gray	poorly graded SAND (SP), mois	st			33 38		• • • • • • • • • •	:		· · · ·
+:	25							·····	•	:	• • • • • • •	25 -
130 —								·····	• • • • • • • • • •	•••••		
+												:
+										:	:	59 🗹
+							30	·····		:		
+ :	30 -		Roring terminated at 30 ft				29					30 -
125 —			Doring terminated at 50 ft.							:÷		: : · · · · -
+												
+												
+										: : :		: : · · · · · · ·
;	35											35 -
120 -												•••••
								:	:	<u>: :</u>	:	



PROJECT: <u>Lansdowne Elementary School</u>									_ PROJECT	NO.:	3622	16
GEO	TEC	СН	CLIENT: Grimm and Parker									
ĔNĠ	INE	ÊŔS,	PROJECT LOCATION: 2301 Alma R	oad, Baltim	ore, M	ID						
INC.		•	LOCATION: see boring location plan							N:	155	
			DRILLER: Recon Drilling, Inc.							BY:	JP	
LUG			DRILLING METHOD: Hollow Stem A	uger						DATE:	3-21	-16
ľ	NO. D'	-18	DEPTH TO - WATER> INITIAL: ♀	dry	AFTE	R 24 H	IOURS	8: ₹	dry	CAVING>	• <u> </u>	25.0'
					.e	ε	ion /hr	, s	Т	EST RESU	ILTS	
evati & Depth	feet		Description		raph	ratu	ltrat e, ir	Blow	Plastic Limit		- Lic	uid Limit
	Ŭ				Ū	ۍ ا	Infi Rat	-0	Penetration -	nt- * ∴∆		
155 -	- 0								10 2	0 30	40	50
155	Ŭ	2" topsoil				В		3 4	٦Ī			0
_		Brown san	dy lean CLAY (CL), moist					6				
								4	13 4			
-					V///			6 7			:	:
150	_										:	_
150 -	- 5							9 10	2	34		5-
-	-							13			••••••	
-	-				\///							
-	+				;		-	12		26	:	
-	-	Brown san	dy SILT (ML), moist					13 13				
145 -	- 10										:	10 -
-	-											
-	-										••••	
-	-			13 5	;				21			
-	-	Brown san	dy lean CLAY (CL), moist	10.0	` <i>\///</i>	В		6 11	21	Ţ		
140 -	- 15							10				15 -
-	-											
-	-											·
-	- [10 5						27		
-	- [Brown san	dy SILT (ML), moist	10.0		С		13 13		212		· · · · · · · · · -
135 -	- 20							14				20 -
-	-											
-	-											
-	-											
-	- 1	Light grav	and light brown silty SAND (SM	23.5). moist				9 13		26		
130 -	25	<g g,="" td="" ·<=""><td></td><td>,,</td><td></td><td></td><td></td><td>13</td><td></td><td></td><td></td><td>25 -</td></g>		,,				13				25 -
-	-											
-	-											
-	-											
-	-							13 13		32 ∆		
125 -	- 30						-	19				30 -
-	_		Boring terminated at 30 ft.									
-	_											
_												
_												
120 -	35											9E
120											:	55
									: :	: :	:	:



	chool					PROJECT NO.:	362216		
GEOTE	CH	CLIENT: Grimm and Parker							
ĔŇĞİNĒ	ËRS.	PROJECT LOCATION: 2301 Alma R	oad, Baltimo	ore, M	D				
INC.	,	LOCATION: see boring location plan		ELEVATION:	149				
		DRILLER: Recon Drilling, Inc.						LOGGED BY:	JP
LOG OF B	SORING	DRILLING METHOD: Hollow Stem A	uger					DATE:	3-15-16
NO. B	-20	DEPTH TO - WATER> INITIAL: ♀	dryA	FTEF	24 H	HOURS	8: ₹	dryCAVING	i> <u>C</u> <u>26.2'</u>
				U	۲	on /hr	6	TEST RES	ULTS
Elevatio & Depth (feet)		Description		Graphi	Stratur	Infiltrati Rate, in	Blow Counts	Plastic Limit │ Water Content - → Penetration - △	— Liquid Limit
⊤ 0	2" topooil				B	-	3	<u>10 20 30</u> ♀	40 50
+	Brown san	dy lean CLAY (CL), moist			D		3 4	7	
- 145 —							3 4		
+ 5 + -							3 3 5	84	5 -
 140 — 10							10 14 24	3	10 -
135 15		ontite at 18.5' to 23.5'					12 14 18	32	/15-
130 - 20	- irontite a						10 14 16	30 -	20-
125 - 25 	<u>_</u>						15 19 23		42
120 - - 30	- Auger re	uger refusal at 28.5' Boring terminated at 30 ft.				-	50/1		50/1 A 30 -
115 - - - 35									35 -

		PROJECT: Lansdowne Elementary S	School				_ PROJEC	T NO.: _	362	2216	
GEOTEC	CH.	CLIENT: Grimm and Parker					_				
ĔŇĞİŇĔ	ËRS.	PROJECT LOCATION: 2301 Alma R	oad, Baltin	nore, M	D						
INC.	,	LOCATION: see boring location plan					ELEVAT	ON:	15	5	
		DRILLER: Recon Drilling, Inc.						вү:	JI	Р	
LOG OF B	ORING	DRILLING METHOD: Hollow Stem A	uger					_ DATE	:3-	21-16	
No. B	-21	DEPTH TO - WATER> INITIAL: ♀	dry	AFTE	R 24 H	iours: 🐺	dry	_ CAVI	NG> <u>C</u>	<u> </u>	
6		•		U	Ę	u ju		TEST RE	SULTS		
Elevati & Depth (feet)		Description		Graphi	Stratur	Infiltrati Rate, in Blow Counts	Plastic Lim Water Con	it ⊢ tent*		Liquid	Limit
155 0							10	20 3	0 40	50)
	2" topsoil				В	1	5		÷	:	0
Ť	Brown san	dy lean CLAY (CL), moist				3					
+							14				
+						6			•••••	•••••	
+											
150 - 5						4	13 🍐				5 -
+						6 7					
+											
+											
+						4 5					· · · · -
145 - 10						6					10 -
_											
_											
						4	13 🍐				
140 - 15						6 7			:		15 -
140 15							÷	: :			15
T								:	÷	:	
Ť											
-			18.	5'	0	9	12 4				
Ť	Light brow	n silty SAND (SM), moist			C	5 7					
135 — 20								\mathbf{X}			20 -
+										•••••	
+											
+									40	• • • • • •	
+						11			- U		
130 + 25						23				\	25 -
+ -	<u>~</u>										
+								· ÷ · · · · · · ·	····÷		
+										\	
+						14 25				50 ∆	
125 — 30		D · · · · · · · · · · · · · · · · · · ·				25					30 -
+		Boring terminated at 30 ft.									
_									····.		
1											
120 25											25
120 - 35							:	:	:	:	30 -
Ť							:	:	:	:	



	_		PROJECT: Lansdowne Elementary S	School					PROJECT NO.:	362216
GEOT	ECH		CLIENT: Grimm and Parker							
ÉNGI	NEER	S,	PROJECT LOCATION: 2301 Alma R	oad, Balti	more, M	ID				
INC.			LOCATION: see boring location plan							155
LOG O	F BORI	ING	DRILLER: <u>Recon Drilling, Inc.</u>						LOGGED BY:	JP
No	. B-22			ugei drv	AFTE	R 24 H		s: ¥	drv CAVING	<u>3-10-10</u>
c									TEST RES	<u> </u>
∕atior & ∋pth ∋et)			Description		aphic	atum	ratio , in/r	low unts	Plastic Limit	Liquid Limit
μ Έleγ			Decomption		Gr	Str	Infilt Rate	0 ^m	Water Content - *	
									Penetration - Δ 10 20 30	40 50
+										\
+								13	36	
, †								17 19	· · · · · · · · · · · · · · · · · · ·	
115 — 4	10									40 -
Ī										
, I										
1								13	36	, L
110 - 4	45 <u>C</u>							16 20		45 -
	·									
+										
+									.	
+								19 38		.∆76 →
105 - !	50						-	38	·····	50 -
-			Boring terminated at 50 ft.							
. +										
. +										
+										
100 — 5	55									55 -
+									· · · · · · · · · · · · · · · · · · ·	
+										• • • • • • • • • • • • • • • • • •
, †										
+									· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
95 — 6	50								······································	60 -
+										••••••••••••••••••
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• • • – •	~=									65 -
90 L	,, ,									00
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. +										
85 - 7	70									70 -
+										
. +										
-										
	•							•		

	P	ROJECT: Lansdowne Elementary §	School				PROJECT NO.:	362	216
GFOTE	сн о	LIENT: Grimm and Parker							
ĔŇĞİNE	ERS.	ROJECT LOCATION: 2301 Alma F	Road, Baltimc	ore, MD)				
INC.		CATION: see boring location plan					ELEVATION:	156	;
		RILLER: Recon Drilling, Inc.					LOGGED BY:	JP	,
		RILLING METHOD: Hollow Stem A	uger				DAT	' E: <u>3-</u> ^	18-16
NO. B	-23 D	EPTH TO - WATER> INITIAL: 😤	dry A	FTER	24 H	IOURS: 🖣	dry CAV	/ING>	27.4'
				.u	۶	hr on	TEST	RESULTS	
Elevatio & Depth (feet)		Description		Graphi	Stratur	Infiltratio Rate, in/ Blow	Plastic Limit Water Content - Penetration -		iquid Limit.
⊤ 0	2" topsoil				Δ	2	<u>10 20</u>	30 40	50 0
155 — +	Brown sandy	lean clay (FILL), moist	-0.5		~	3 3	<u>ь</u>		
+	Brown sandy	lean CLAY (CL), moist	2.5		В	3 7 7			
- 5						5	17		5 -
150						10			
+ - - 10						5 11 12	23		10 -
145 + + + + + + + + + + + + + + + + + + +									
- - 15 140 -						8 11 13			15 -
+ - - - 20						10 13 13		· · · · · · · · · · · · · · · · · · ·	20 -
135			23.5'			10		33	
+ + 25 130 - + 	Light brown s	ilty SAND (SM), moist			C	16 17	······		25 -
- - - 30		Poring terminated at 30 ft				4 9 15	24		30 -
125 — _ _		soring terminated at 50 ft.							
- - 35 120 -							·····		35 –

		PROJECT: Lansdowne Elementary Se	chool				PROJECT NO.	:3	362216	
GEOTE	CH	CLIENT: Grimm and Parker								
ENGINE	EERS,	PROJECT LOCATION: 2301 Alma Ro	oad, Baltim	nore, M	ID					
INC.		LOCATION: see boring location plan			155					
LOG OF	BORING	DRILLER: <u>Recon Drilling, Inc.</u>	laor						JP 2 21 16	
No. E	3-24	DEPTH TO - WATER> INITIAL: ¥	drv	AFTE	R 24 F	Hours: ¥	drv CA	VING>	$\frac{3-21-10}{2}$	5 6.0'
C							TEST	RESULT		0.0
Elevation & Depth (feet)		Description		Graphic	Stratum	Infiltratio Rate, in/r Blow Counts	Plastic Limit	*	Liquid	d Limit
155 0							10 20	30 4	40 50	0
	3" topsoil	dy lean aloy (FILL) maint			A	3	7			0
+	Brown san	idy lean clay (FILL), moist				4				
_						2	54			
+						2				
150 — 5						2	54			5 -
+						2 3			:	
+										
+				. 🗱					÷ · · · · · · ·	
+	Brown dar	k grav lean CLAY (CL), moist	8.5		В	34				
145 — 10	- trace ro	ots at 8.5'				6				10 -
+										
+										
+										
+						4 4				
140 — 15						7				15 -
+										
+										
+										
+						4				
135 — 20								<u>`</u>	:	20 -
+									<	
+								·		
+				5'				•••••••••••••••••••••••••••••••••••••••		△62 →
+	Reddish b	rown and light brown silty SAND	(SM),		С	10 28 34				-02 -
130 — 25	trace ironit	e, moist				34		•••••••••••••••••••••••••••••••••••••••	:	25 -
+ -	<u> </u>									
+										
+						15				∆63 →
+						28				
125 — 30		Boring terminated at 30 ft.						•••••••		30 -
+		6								
+								:	:	
+								:	:	
+								•••••••••••••••••••••••••••••••••••••••	:	
120 - 35								:	:	35 –
+							· · · · · · · · · · · · · · · · · · ·	•	<u>:</u>	

		PROJECT: Lansdowne Elementary S	chool					PROJECT NO.:	362216
GEOTEC	CH	CLIENT: Grimm and Parker							
ĔŇĞĬŇĔ	ËRS,	PROJECT LOCATION: 2301 Alma Ro	oad, Baltimo	ore, M	D				
INC.	•	LOCATION: see boring location plan						ELEVATION:	149.5
		DRILLER: Recon Drilling, Inc.						LOGGED BY:	JP
	_25		Jger						3-18-16
	-25	DEPTH TO - WATER> INITIAL: ₹	dry		₹24 r	HOUK	S: ₹		> <u>C</u> <u>25.0</u>
Elevation & Depth (feet)		Description		Graphic	Stratum	Infiltration Rate, in/hr	Blow Counts	Plastic Limit H Water Content - * Penetration - △	ULTS — Liquid Limit
_ 0	O" torooil				^	-	2	10 20 30	40 50 0
	2" topsoli Brown san	dy lean clay (FILL), moist			A		3 5	8	·····
	Brown san	dy lean CLAY (CL), moist	2.5		В		4 5 5		
145 - 5 -							2 3 3	6	5 -
							_		
140 - 10							2 4 5		10 -
135 - 15							3 4 5	94	15 -
130 - 20							2 4 3		20 -
125 - 25 -	~						8 12 17	29	25
- - - -									
120 - 30	Yellowish t	prown silty SAND (SM), moist	28.5'-		С		10 16 17	33 Å	30 -
		Boring terminated at 30 ft.							
									· · · · · · · · · · · · · · · · · · ·
115 - 35									35 -
1				1					





		PROJECT: Lansdowne Elementary S	School				PROJEC	T NO.:	362	2216	
GEOTE	СН	CLIENT: Grimm and Parker									
ĔŇĞĺŇĔ	ËRS.	PROJECT LOCATION: 2301 Alma R	oad, Baltim	nore, M	D						
INC.	,	LOCATION: see boring location plan					ELEVATI	ON:	15	5	
		DRILLER: Recon Drilling, Inc.					LOGGED	BY:	J	Ρ	
LOG OF E	BORING	DRILLING METHOD: Hollow Stem A	uger					DATE	: 3	-21-16	
No. B	-28	DEPTH TO - WATER> INITIAL: 🐺	dry	AFTE	R 24 H	Hours: 🐺	dry	CAVI	NG> _C	23.	.6'
ç				0	_	5 5		TEST RE	SULTS		
Elevatic & Depth (feet)		Description		Graphic	Stratum	Infiltratic Rate, in// Blow Counts	Plastic Limi Water Cont Penetration	t		Liquid L	Limit
155 — 0					^	2	<u>10</u>	20 3	0 40	50	0
+	Brown san	dy lean clay (FILL), moist			A	4	8				
-	Brown san	dy lean CLAY (CL), moist	2.5		В	3 3 5	8 4:				
150 - 5											5
-						3 3 5					
+							10				
+ 145 10						3 4 6					10 -
+											
						3	84				
140 — 15 _ _						4					15 -
135 - 20	Light brow	n silty SAND (SM), moist	18.5	5'	С	7 11 11	2	2			20
130 — 25 	~					15 18 22			40		25 -
- - 125 30 -		Boring terminated at 30 ft.				21 28 29	·····			5	57 <u>-</u> 30 -
120 - 35							· · · · · · · · · · · · · · · · · · ·				35 -
†							<u></u>				

		PROJECT: Lansdowne Elementary So	chool					_ PRO	JECT	NO.:	3	362216	5	
GEOTEC	СН	CLIENT: Grimm and Parker												
ENGINE	ËRS,	PROJECT LOCATION: 2301 Alma Ro	oad, Baltim	ore, M	D									
INC.	·	LOCATION: see boring location plan						_ ELE	VATIC	DN:		151		
		DRILLER: Recon Drilling, Inc.						LOG	GED	BY:		151 JP 3-18-16 C 23.0' TS Liquid Limit 40 50 0 5- 5- 10- 10- 10- 10- 10- 10- 20- 20-		
	-29	DRILLING METHOD: Hollow Stem Au	iger				_			DATE	∷	<u>3-18-1</u>	16	
NO. D	LJ	DEPTH TO - WATER> INITIAL: ¥	dry	AFTE	R 24 F	HOURS	÷		dry		NG>	<u> </u>	23.0'	
tt tion				hic	ш	tion n/hr	w	Disatio	T	EST R	ESUL	rs Luimu	: - ::4	
leva & Depi (fee		Description		èrap	strati	filtra ate, i		Water	Conte	ent->	*	Liqu	ia Limit	
Ξ				0	0	Ξŵ		Penet	ration	- 🛆				
⊤ 0	0".(^	-	з	1	<u>0 2</u>	20 3	30 4	10	50	
150 —	2" topsoil Brown san	dy lean clay (FILL) moist			A		6 7		13	•••••••	: 			
÷	DIUWII San	uy lean day (TILL), moist							• • • • • • •		: :	÷	÷	
÷							8 8			24 🏹	: :	÷		
+							16			:			÷	
- 5)' 🗱	_		11				36 △		5 -	
145 —	Brown to d	ark brown sandy lean CLAY (CL	.), moist		В		16 20							
							20				/			
1										÷,	/	÷		
_							9			28 4	:	:	:	
- 10							12 16				:	:	10 -	
140										: /			. 10	
140 -											:	:	:	
1											:	151 JP 3-18-16 C _23.0' I I Liquid Lim 10 10 10 10 10 20 20 21 30 30	:	
†				7 10 13		2	3 Á	:	:	:				
+							10 13			· \ · · ·	:	:	:	
+ 15													15 -	
135 —										····/	\	:	:	
+										••••••				
+							~				- - Δ	:		
+							9 15			· · · · · `			·····-	
- 20							19			÷	:/		20 -	
130 —										<u>.</u>	/		÷	
+											! <u>.</u>			
+ -	<u> </u>									/		÷	: : :	
+							9 10			27				
- 25							17			····· `	\		25 -	
125 —													÷	
+										<u>.</u>	. \	÷	÷	
+														
+							8 15			<u>.</u>	37 🛆			
- 30							22						30 -	
120 -		Boring terminated at 30 ft.									•••••			
120										:	•	•	:	
										:	:	:		
										:	:	:	:	
Ť										:	••••••	•		
- 35										:	:	:	35 -	
115 —										••••••		<u>:</u>	:	

		PROJECT: Lansdowne Elementary School					_ PROJECT	NO.: _	3	62216	
GEOTEC	CH	CLIENT: Grimm and Parker									
ENGINE	ÊŔS,	PROJECT LOCATION: 2301 Alma Road, Baltim	ore, M	ID							
INC.		LOCATION: see boring location plan						N:	1	52	
		DRILLER: Recon Drilling, Inc.						BY:		JP	
	.30	DRILLING METHOD: Hollow Stem Auger				_		DATE	:	3-21-1	6
	-30	DEPTH TO - WATER> INITIAL: \ → dry /	AFTE	R 24 H	IOURS:	÷	dry	CAVI		2 _2	2.0'
th tion			hic	Ę	ition w	uts	Disatia Limit			S	-' Limit
leva & Dep (fee		Description	Grap	Strat	filtra ate, i Blo	Cour	Vater Conte	int- +	:	Liqui	
ш					드꾼		Penetration ·	- Δ			
0	2" topsoil		×××	Α		2		<u>:0 3</u>	0 4	0 5	50 0
+	Brown san	dv lean clav (FILL), moist				3 3	0				
150 —	2.0	ay ioan olay (i i <u></u>), inclos	. 🗱					~			: :
-	Brown to d	ark brown sandy lean CLAY (CL), moist	\overline{V}	В]],	8 11	22	Î			
+						11					: :
- 5						8	21	Á			5 -
+						10 11					: : · · · · · -
145 —											
+								~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	\backslash		: : · · · · · -
-						10 14		32	4		
- 10						18					10 -
+											
140 +											
+									22		
+					9 15 24	9 15			39 4		
- 15						24					15 -
+											
135 —											
+											
+						12 16			4	4	
- 20						28				/	20 -
+	\[/		
130 - (~										
+											
+						6 10		3	4		
- 25						24			/		25 -
+								/			
125 —								. /			
+							2	•			
+						11 10		34			
- 30		Poring terminated at 30 ft	<i>\///</i>			13					30 -
+		Bornig terminated at 50 ft.									
120 —											
+											
+											
— 35											35 -
+											
								· · ·			<u> </u>

		PROJECT: Lansdowne Elementary School					_ PROJECT	NO.: _	3	62216	
GEOTE	ECH	CLIENT: Grimm and Parker					_				
ENGIN	EERS,	PROJECT LOCATION: 2301 Alma Road, Baltim	nore, N	1D							
INC.		LOCATION: see boring location plan						N:	1	53	
LOG OF	BORING	DRILLER: Recon Drilling, Inc.					_ LOGGED I	BY:		<u>JP</u>	
No.	B-31		AFTE	R 24 I		⊻	drv		.: NG> (<u>3-16-10</u> 2	6 1 0'
						-		EST RI		<u> </u>	
∕atior & spth		Description	aphic	atum	i, in/h	unts	Plastic Limit	<u> </u>		Liqui	d Limit
Elev D		Decemption	Gre	Str	Rate	о С	Water Conte	nt - *	¢		
							Penetration - 10 2	 103	0 4	0 5	50
	3" topsoil			А		3 3	7				0
	Brown silty	v sand (FILL), moist				4					
150 -	Brown to d	2.5		В	$\left\{ \right\}$	3	14 2				
	BIOWITIO	lark brown sandy lean CLAF (CL), moist				ь 8					
- 5						6	21	2			5 -
+						9 12					
-											
145 —											:
+						10 11	2	24 4			
+ 10						13					10 -
+											
+											
140 —										16	
+					14 20				40 4		
- 15						26					15 -
+											
+											
135 —						14				51	ý
+						22 29		•••••		/	/
- 20							• • • • • • • • • • • • • • • • • • • •			. /	20 -
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120									,	/	
130 _						11			38 🗸		
- 25						16 22					25 -
2											20
1											
125 —											
+						12 16			4 0 /	7	
- 30			- <i>[[]</i>	1		24					30 -
+		Boring terminated at 30 ft.									:
+											
120 —											
+											
- 35	;										35 -
+											
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		PROJECT: Lansdowne Elementary School					PROJECT NO.:	362216
GEOTE	СН	CLIENT: Grimm and Parker						
ĔŊĞĬŊĔ	ËËRS,	PROJECT LOCATION: 2301 Alma Road, Baltir	nore, M	ID				
INC.	•	LOCATION: see boring location plan					_ ELEVATION:	154
		DRILLER: Recon Drilling, Inc.					LOGGED BY:	JP
	2-22	DRILLING METHOD: Hollow Stem Auger					DATE: _	3-15-16
	-JZ	DEPTH TO - WATER> INITIAL: 😤 dry		R 24 H	HOUR	S: 莱	dry CAVING	> <u>C</u> <u>26.0'</u>
levation & Depth (feet)		Description	Graphic	Stratum	ifiltration ate, in/hr	Blow Counts	TEST RESI	JLTS — Liquid Limit
Ш	+		+	•-	L= ₩		Penetration - \triangle	40 50
0	2" topsoil Brown san roots, rock Brown to c	dy lean clay (FILL), moist - contains fragments, etc. dark brown sandy lean CLAY (CL), moist	5	A B		2 3 3 4 7 8		0
150 + - 5 - - +						4 7 9	16	5-
145						12 8 7		10 -
140 + 15						3 4 6	10	15-
135 — — 20 —						12 24 32	· · · · · · · · · · · · · · · · · · ·	56A 20 -
	¢_					7 11 13	24.4	25 -
125 - - - 30		Boring terminated at 30 ft.			-	7 10 14	24 △	- 30 -
120 - - 35 								35 -

		PROJECT: Lansdowne Elementary Sc	hool				PROJECT	NO.:	3622	216
GEOTE	СН	CLIENT: Grimm and Parker								
ENGINE	ERS,	PROJECT LOCATION: 2301 Alma Ro	ad, Baltimore	e, MD						
INC.	·	LOCATION: see boring location plan						ON:	149.	5
	RORING	DRILLER: <u>Recon Drilling</u> , Inc.					LOGGED	BY:	JP	
No B	2-33	DRILLING METHOD: Hollow Stem Aug	ger					DATE:	3-1	7-16
		DEPTH TO - WATER> INITIAL: 😤 🔤	dryAF	TER 2	4 HC	DURS: ₹	- dry		G> <u>(</u>	24.5'
th tion				hic	g,	w w		EST RE	SULTS	
leva & Dep (fee		Description		Srap	otrat	filtra ate, i Blo	Water Conte	ent-*	L	iquia Limit
Ξ					<i>"</i> .		Penetration	- A		
_ 0			×	\sim	^	3	<u>10</u> 安	20 30	40	50 0
-	2" topsoli Brown san	dy lean clay (FILL) moist	X	XX ′		3	1	÷		·····
-	- contain	s roots, rock fragments, etc.	8	×				÷		
-	Brown to d	lark brown candy loan CLAY (CL	2.5	Ϊ E	З	3	8 4	: :		
-	BIOWINO U	lark brown sandy lean CLAT (CL	, moist			5				
145						3	10 2	· · · · · · · · · · · · · · · · · · ·		5 -
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-						0				
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-						3	9 🛆			
140 -						4 5				10 -
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135 - 15			ľ			3 4				15 -
- 15										10
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-						2	84			
130 -						4 4		÷	• • • • • • • • • • • • • • • • • • • •	20
- 20			ĺ					:	:	20 -
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-			23.5		_	7	2	23 4		• • • • • • • • • • •
125	<pre></pre>	/ SAND (SM), moist				10 13				
- 25										25 -
								····· \ ·		
-								/	\	• • • • • • • • • •
-						10		34	ιλ	
120 -						14		:		
- 30		Boring terminated at 30 ft.	E3							30 -
-		C								
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-								:		
115 -										· · · · · · · · · · · · · · · · · · ·
35								: : :		35 -
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			PROJECT: Lansdowne Elementary School					PROJEC	T NO.:	3	62216	
GEO	TEC	CH	CLIENT: Grimm and Parker									
ĔNĞ	İNĒ	ËRS.	PROJECT LOCATION: 2301 Alma Road, Baltin	nore, N	1D							
INC.		,	LOCATION: see boring location plan					_ ELEVAT	ION:	•	49	
			DRILLER: Recon Drilling, Inc.) BY: _		JP	
LUG			DRILLING METHOD: Hollow Stem Auger							E:	3-16-1	6
	чо. D	-34	DEPTH TO - WATER> INITIAL: ₩ dry	AFTE	R 24 I	HOUR	S: ₹	dry	_ CAV	NG> 🤇	<u> </u>	2.0'
, ioi	~			je.	Ξ	ion/h	ts <		TEST R	ESULT	S	
Elevati & Deptl	(feet)		Description	Graph	Stratu	Infiltrati Rate, ir	Blow Coun	Plastic Lim Water Con Penetratio	nit	 ∗ 2∩ ⊿	Liquid	ל Limit ה
T	- 0	3" topsoil			A	1	3	1 1				0
+	-	Brown san	dy lean clay (FILL), moist roots, rock fragments, etc.				3 4			•	•	
145	-	Brown to d	ark brown sandy lean CLAY (CL), moist	5	В		3 5 5	10 4				
145									21	:	:	5 -
_							4 9			:	•	5
_	_						12			:	•	
_	_									: 	•	
140 -	_						10		28	••••••	•	
	- 10						15			İ		10 -
_	-									\		
_	_											
-	_										•	
135 —	-						9 14		3	32		
_	- 15						19			;/	:	15 -
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130 -	-						9 11		25 🛆	: 	•	
-	- 20						14			: :	•	20 -
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-	-									<u>.</u>	•	
125 —	-						6 11		31	4		
-	- 25						20				: : · · · · · · ·	25 -
-	-											
-	-										•	
-	-									20		
120 -	-						10 15			39 /	•	
-	- 30		Doming terminated at 20 ft		1	_	24					30 -
-	-		Boring terminated at 50 ft.									
-	-									: :	: : · · · · · · ·	
-	-									••••••		
115 —	-										•	
+	- 35									:	:	35 -
+	-									:	:	· · · · · · ·
						1		1				

	_		PROJECT: Lansdowne Elementary Sc!	hool					PROJECT NO.:	362216
GEO]	TEC	ЭН	CLIENT: Grimm and Parker							
ĒNGI	INE	ÊRS,	PROJECT LOCATION: 2301 Alma Roa	ad, Baltimo	ore, M	D				
INC.		-	LOCATION: see boring location plan						ELEVATION:	154
LOG (OF B	ORING	DRILLER: Recon Drilling, Inc.						LOGGED BY:	JP
N	lo. B	-35		jer dry (24 1		. <u>v</u>	DATE: _	3-16-16
		•••				(24 1		5. -		> <u> </u>
Elevation & Depth	(feet)		Description		Graphic	Stratum	Infiltratior Rate, in/h	Blow Counts	Plastic Limit Water Content - *	Liquid Limit
Т	- 0	2" topcoil				Δ		2	<u>10 20 30</u> 굿	40 50 0
150 +	-	Brown san - contains Brown to d	dy lean clay (FILL), moist s roots, rock fragments, etc. lark brown sandy lean CLAY (CL)	2 <i>:5</i> '), moist		В		2 2 4 5 6		~ ~ ~
	- 5							4 5 9		5 -
145	- 10							5 7 9		10 -
140 - -	- 15							7 11 17	28	15 -
+ 135 + +	- 20							8 10 14	24	20 -
130	- 25	2						10 14 19	33	25 -
125	- 30		Boring terminated at 30 ft.					8 13 18	31 △	
120	- 35									
										<u>:</u> :



			PROJECT: Lansdowne Elementary So	chool					PROJ		NO.:	3	62216	
GEO	TEC	ЭН	CLIENT: Grimm and Parker								_			
ĔŇĞ	INÈ	ËRS.	PROJECT LOCATION: 2301 Alma Ro	ad, Baltim	ore, M	ID								
INC.		,	LOCATION: see boring location plan						_ ELEVA		N:	14	18.5	
			DRILLER: Recon Drilling, Inc.						_ LOGG	ED B	Y:		JP	
LUG			DRILLING METHOD: Hollow Stem Au	ger							DATE	:	3-17-1	6
	чо. D	-37	DEPTH TO - WATER> INITIAL: ♀	dry /	AFTE	R 24 I	HOURS	S: ₹	dr	у	CAVI	NG> _	2 _2	1.5'
ы Ч					jc	Ξ	ion /hr	۲ ts		TE	ST RE	ESULT	S	
Elevat & Dept	(feet		Description		Graph	Stratu	Infiltrat Rate, ir	Blov Coun	Plastic L Water C Penetrat	imit onten ion -	t- ∗ ∆	<u>.</u>	Liqui	d Limit
	0	2" topsoil			×××	Δ	-	3	<u>10</u> 分	20) 3	0 4	0 5	0
	-	Brown san	dy lean clay (FILL), moist					3 4	· · / · ·	· · · · ÷				
	-	- contain	s roots, rock fragments											
145	-							3 5						
145 -	-							6						
-	- 5			5.0	•	B	-	3	11					5 -
-	-	Brown to d	lark brown sandy lean CLAY (CL	.), moist				4 7		· · · · ·				
-	-													
	-									· · · · ·				
140 -	-							3 4	10 4					
-	- 10							6						10 -
-	-													
-	-									. .		$\overline{\ }$:
-	-													
135 -	-							9 35					47	
-	- 15							12						15 -
-	-												/	
-	-													:
-	-													
130 -	-							6 14			32	Å		
-	- 20							18				/		20 -
-		`									/			
-		<u>~</u>												
-	-													
125 -	_							8		2	54			
-	- 25							14						25 -
-	_													
-	-											\		
-	_													
120 -	_							8			3	4 À		
-	- 30							20						30 -
-	_		Boring terminated at 30 ft.											
-														
-	_													
115 -										. .				
-	- 35													25 -
-										:				
-									:		-	:		:

			PROJECT: Lansdowne Elementary School					PROJECT NO.:	362216
GEO	TEC	ЭН	CLIENT: Grimm and Parker						
ĔÑĞ	INE	ËRS.	PROJECT LOCATION: 2301 Alma Road, Baltin	nore, N	1D				
INC.			LOCATION: see boring location plan					ELEVATION:	149
			DRILLER: Recon Drilling, Inc.					_ LOGGED BY:	JP
LUG			DRILLING METHOD: Hollow Stem Auger					DATE:	3-16-16
ſ	NO. В	-38	DEPTH TO - WATER> INITIAL: ♀ dry	AFTE	R 24 I	HOUR	S: ₹	dryCAVING>	<u> </u>
uo c				<u>.</u>	ε	/hr	_ v	TEST RESU	ILTS
Elevati & Depth	(feet)		Description	Graph	Stratu	Infiltrati Rate, in	Blow Count	Plastic Limit Water Content - ★ Penetration - △	- ⊢ Liquid Limit
=	- 0	2" topooil				-	2	<u>10 20 30</u>	40 50 0
-	-	Brown san	dy lean clay (FILL), moist s roots, rock fragments2	<u>_</u>			3 3	•\ 11 ↔	
- 145	+	Brown to d	ark brown sandy lean CLAY (CL), moisi		Б		5 6		
-	- 5						4	17	5 -
-	-						10		
140 -	- 						9 15 21	36	10 -
-	-								
135 -	- 15	- ironite le	edges from 13.5' to 16.0'						50/4"
-	-								
- 130 - -	- - - 20						12 14 24	38	20 -
-		~							
125 -	- 25						9 14 23	37	<u>}</u> 25 −
-	+								
120 -	- 30		Boring terminated at 30 ft				4 7 9	16 🗹	30 -
-	-		Doring communed at 50 ft						
115 -	- 35								35 -
	+								······

GEOTECH			PROJECT: Lansdowne Elementary S	_ PROJECT NO.:	36221	16					
		:H	CLIENT: Grimm and Parker								
ENGINEERS, INC.			PROJECT LOCATION: 2301 Alma R	oad, Baltim	ore, M	D					
			LOCATION: see boring location plan						ELEVATION:	149	
			DRILLER: Recon Drilling, Inc.						LOGGED BY:	JP	
			DRILLING METHOD: Hollow Stem Au	uger					DATE:	3-17	<u>'-16</u>
N	о. в-	39	DEPTH TO - WATER> INITIAL: 😤	dry	AFTE	R 24 H	HOURS	S: ₹	dry CAVING	i> <u> </u>	24.0'
uo ,					ic	E	on /hr		TEST RES	ULTS	
Elevati & Deptr	(feet)		Description		Graphi	Stratur	Infiltrati Rate, in	Blow Count	Plastic Limit Water Content - ★ Penetration - △	—∣ Liq	_l uid Limit
Т	- 0	2" topooil			***	Δ	-	3	10 20 30	40	50 0
145	- 5 - 10	Brown san	dy lean clay (FILL), moist s roots, rock fragments, etc.			~		2 2 4 4 6 2 2 3 2 1 2			5 - 5 - 10 -
135 - - - - 130 -	- 15 - 20	Brown to li	ght brown sandy lean CLAY (CL	13.5 .), moist		В	-	3 4 6 2 3 6	10 Å 9 Å		- 15 - 20 -
125	- 25	È ironite a	t 23.5'					5 9 31 6 11 18	29 4	40	25 -
	- 30 -		Boring terminated at 30 ft.								30 -
-	- 35									: : : : :	35 -



GEOTECH ENGINEERS,		PROJECT: Lansdowne Elementary School							PROJECT NO.:			362216		
		CLIENT: Grimm and Parker						_						
		PROJECT LOCATION: 2301 Alma R	Road, Baltim	nore, M	ID									
INC.		LOCATION: see boring location plan						_ ELE	VATIC	DN:	1	51		
LOG OF		DRILLER: Recon Drilling, Inc.							GED	BY:		JP		
No. 5	SWM-1		luger	ACTE	0 24 1		2. X		day		::	<u>3-9-16</u>	5 5 0'	
		DEPTH TO - WATER> INITIAL: ÷			K 24 r		5: ≑			CAVI		<u></u>	5.0	
ation oth et)				ohic	tum	ation in/hı	w nts	Plastic	l imit		ESULI	<u>s</u> Liquir	d L imit	
Dep & G		Description		Grap	Stra	nfiltra ate,	Cou	Water	Conte	ent-≯	<	Liquid		
ш						= ~		Penet	ration ·	- <u>\</u>	0 4	0 5	.0	
⊤ 0	2" topsoil						3	9	0 2	20 3	0 4	0 5	0	
150 —	Brown san	dy lean clay (FILL), moist					4 5					• • • • • • • •		
+	- contains	roots						11	<u>}</u>					
+							5							
+							Ū					•••••	•••••	
- 5							3	84					5 -	
145 —							4							
-														
+								94				•		
+							4				•••••	• • • • • • • •	••••••	
+ 10	0						Ū				• • • • • • • •	••••••	10 -	
140 —									1		• • • • • • • •	• • • • • • • •	•••••	
+											• • • • • • • •	•••••	· · · · · · · · ·	
-				5'			4	1:	32					
+	Brown fat	CLAY with sand (CH), moist					6 7				:	••••••••••••••••••••••••••••••••••••••	••••••	
+ 1	5	Boring terminated at 15 ft.								•••••		•	15 -	
135 —		-								•••••	• • • • • • • • •	······································	•••••	
Ť										•••••	• • • • • • •	• • • • • •	•••••	
										•		•	•	
											•	•		
1 20	0										:	:	20 -	
130												:		
Ι										:	:	:	:	
											•	•		
- 2	5											· · · · · · · · · · · · · · · · · · ·	25 -	
125 -											•	•	20	
125												· · · · · · · · · · · · · · · · · · ·		
											•	•		
1												•		
- 30	0											•	30 -	
120 -														
_														
_														
- 3!	5											•	35 -	
115 -													· · · · · · ·	
1 1/4/				I		I				•			•	
1-1/4" pvc 4" pipe was	pipe was installed s installed to 14' i	d for 24hr groundwater reading in the alternate hole INF-1A												

		PROJECT: Lansdowne Elementary School						PROJECT NO.:			36		
GEOTECH		CLIENT: Grimm and Parker											
ĔŇĞİŇĔ	ËRS.	PROJECT LOCATION: 2301 Alma Road, Baltimore, MD											
ĪNĊ.	,	LOCATION: see boring location plan	1					_ ELE	VATIC	N:	1	53	
		DRILLER: Recon Drilling, Inc.							GGED	вү:		JP	
		DRILLING METHOD: Hollow Stem A	uger							DATE	÷	3-9-16	<u>} </u>
NO. 5W	/ 1VI-Z	DEPTH TO - WATER> INITIAL: ₩	dry	AFTE	R 24 H	HOURS	S: ₹		dry	CAVI	NG> _	<u> </u>	0.0'
h ion				j <u>c</u>	Ξ	ion /hr	ts <		Т	EST R	ESULT	S	
evat & Dept (feet		Description		iraph	tratu	iltrat te, ir	Blov	Plasti	c Limit r Conte	unt_ ≯		Liquid	ל Limit
Ш Ц Г				U	S	Inf Ra	0	Penet	tration	- A			
⊤ 0	0				,		2	<u>7</u>	0 2	<u>20 3</u>	0 4	0 5	0
_	2" topsoil Brown son	dy loop day (FILL) moist					3	6	•				
+	- contains	roots					Ū		•••••				
150 -	Drawn aan		2.5				3 4	84					
_	Brown san	dy lean CLAY (CL), moist					4	`	\		:		:
- 5							4	12	\mathbf{z}		: :		5 -
1							6						
				V///			U						
145 —													
							6		19 ⁾	7			
							8 11		•				10 -
10		Boring terminated at 10 ft.							•	•	:		10
									:		:	:	
									:	:	: :		:
140 —											:		
+										•			
- 15									•				15 -
Ť									••••••	•			
									•••••				
135 —									•	•			
Ť									•••••	•••••			· · · · · · · · · · · · · · · · · · ·
- 20									•••••	•••••			20 –
Ť									••••••		:		
+									• • • • • •				
130 -									•				· · · · · · ·
+													
- 25									• • • • • • •				25 -
+													
+									•••••				
125 —									•••••				
+									•••••				
- 30									• • • • • • •				30 -
+									•	•••••			
+									•••••				• • • • • • • •
120 —									: :		:		: :
+													
— 35													35 -
+									••••••				
1 1/4"									•	•	·		
1-1/4" pvc pipe 4" nine was in	e was installed stalled to 7' in	1 for 24hr groundwater reading. the alternate hale INE-24											
r pipe was in	sianca io / in	the unernate note five 211.											

GEOTECH		PROJECT: Lansdowne Elementary School						PROJ	JECT	NO.:	3	362216	
		CLIENT: Grimm and Parker	_										
ĔŇĞİŇ	ĒĖRS.	PROJECT LOCATION: 2301 Alma Road, Baltimore, MD											
INC.	,	LOCATION: see boring location plan						_ ELEV	ΑΤΙΟ	N:	1	55	
	BORING	DRILLER: Recon Drilling, Inc.							GED E	BY:		JP	
		DRILLING METHOD: Hollow Stem Au	uger							DATE	l:	3-9-16	<u> </u>
NO. C		DEPTH TO - WATER> INITIAL: 😤	dry /	AFTE	R 24 F	HOURS	S: ₹	d	ry	CAVI		<u> </u>	0.0'
of the stight of the state of t				hic	ш	ation in/hr	w ts	Plactic	 Limit	ESTR	ESULI	<u>S</u> Liquir	d Limit
Dep (fee		Description		Grap	Strat	nfiltra ate,	Coul	Water (Conte	nt-≯	<	Liquit	
ш	_			<u> </u>		<u> </u>		Penetra	ation -	Δ			
155 — 0	2" topsoil			***			2	<u>10</u>	2	0 3	0 4	0 5	0
+	Brown san	dy lean clay (FILL), moist					3 5					• • • • • • • •	
+	- contains	roots, rock fragments						13	λ			• • • • • • • •	
+							3 6 7					• • • • • • • •	
+							'			· · · · · · · · · · · · · · · · · · ·		• • • • • • • •	
150 — 5	Brown fat (CLAX with sand (CH) moist	5.0				7		23	32		• • • • • • • •	5 -
+	Diowinati						9					•	
+												• • • • • • • •	
+							7		23	3 4		•••••	
+	<u>_</u>						9 14		• • • • • •			•••••	
145 — 10	- Y	Boring terminated at 10 ft.										• • • • • • • •	10 -
+		-										• • • • • • • •	
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+												•••••	
											•	•	
140 - 15												•	15 -
Ī													
											•		
_													
135 - 20												• • • • • • • • •	20 -
_													
+													
+													
130 - 25													25 -
+													
+													:
+													
+												•	
125 — 30												 •	30 -
+													
+													
+													
+												• • • • • • • •	
120 - 35													35 -
+												•••••	: :
1-1/4" myc r	ine was installa	d for 94hr groundwater reading		1									
4" pipe was	installed to 7' in	the alternate hole INF-3A.											

GEOTECH ENGINEERS,			PROJECT: Lansdowne Elementary School							PROJECT NO.: _			362216		
		:H	CLIENT: Grimm and Parker												
		ËRS,	PROJECT LOCATION: 2301 Alma R	PROJECT LOCATION: 2301 Alma Road, Baltimore, MD											
INC.			LOCATION: see boring location plan						_ ELE	Ενατια	DN:	1	158		
			DRILLER: Recon Drilling, Inc.							GGED	BY:		JP		
	o SW	M-4		uger				~ •		•.		E:	3-11-1	6	
		IVI-7	DEPTH TO - WATER> INITIAL: 😤	dry		R 24 r		S: ≑		dry	CAVI		<u> </u>	0.0	
ation	x)		-		hic	E L	ation in/hr	w nts	Diasti	o Limit	LSIK	ESULI	S	d Limit	
Ber 8 Der	(fee		Description		Grap	Straf	ate,	Cou Cou	Wate	r Conte	r ent->	-— ı ≮	Ццик		
							<u>⊢</u> ∞	Ŷ	Pene	tration	- △		10 E		
F	⊤°∣	2" topsoil						3		<u>, 10</u>	20 .	<u>30 4</u>	<u>IU u</u>	0	
-	+	Brown fat (CLAY with sand (CH), moist					4 5			÷	:	•••••		
4	+									18		:	••••••		
155 —	+							4 7 11				:	•••••		
-	+									:	\sim	:	••••••		
4	- 5							4		•••••	30	Å	•	5 -	
-	†							18		:	:	:\	:	: 1	
-	†														
150 -	†							12				36			
1	† †							14 22		•	•••••	•••••• •	••••••		
f	+ 10 *		Boring terminated at 10 ft.				1			•••••	: :	:	•	10 -	
1	†		-							:	:	:	••••••	: 1	
	†									:	:	:	•	: 1	
145 -	†									:	:	:	••••••	: 1	
-	† _									:	:	:	•	1	
1	- 15									•	••••••	•••••	•••••	15 -	
-	T I									•	••••••	••••••	•		
140 -	Ţ.									••••••			•		
7.40	[]									:		; ;			
-	20									:	: :	:	•	20 -	
-										• •	<u>.</u>	:	•	. 20	
-										:	: 	: :	•		
135 —										:	: 	:	•	:	
										:	: :	: :	•		
-	25											: :	•	25 -	
-	↓									: 		: :			
-	- I														
130 -															
-	- I									:	÷	: :	: 	: 	
-	- 30										÷		:	30 -	
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_	-									:	÷	: 	:	÷	
125 -	+									: :	÷	: :	•	÷	
_	-									:	<u>.</u>	:	:	÷	
_	- 35									:	÷	: :	• •	35 -	
_	+									:	÷	: :	•	÷	
1 1//",		as installa	d for Mhr aroundwater reading							•	<u>.</u>	<u>.</u>	<u>.</u>	<u> </u>	
4" pipe	was ins	talled to 7' in	the alternate hole INF-4A.												
GEOTECH		PROJECT: Lansdowne Elementary School					PROJEC	T NO.:	362	216					
-----------------------------	--	---	----------	-------	-----------------	-------------	-------------	----------------	-------------	-------------	--				
		CLIENT: Grimm and Parker													
ĔŇĞĬŇ	ĪĒĒRS,	PROJECT LOCATION: 2301 Alma Road, Baltimore, MD													
INC.	•	LOCATION: see boring location plan					_ ELEVAT	ION:	155						
		DRILLER: <u>Recon Drilling</u> , Inc.) BY:	JP						
No. S	SWM-5					o. v	5.01		: <u>3-</u>	3-11-16					
		DEPTH TO - WATER> INITIAL: 👻 dry		=R 24	HOUR	s: ≑ ा	5.3								
ath ation		–	hic	tu l	ation in/hı	nts v	Plastic Lim			iquid Limit					
Dep & G		Description	Grap	Stra	∩filtr; ate,		Water Con	itent - *							
ш					= ~		Penetratio	n - ∆	0 40	50					
155 — 0	2" topsoil					3	<u> </u>	20 3	0 40	50					
+	Brown fat (CLAY with sand (CH), moist				3 3									
+						2	10								
+				2		5									
+				1		ľ									
150 — 5	¥					4	12 🗸			5 -					
Ť						6		$\overline{\}$							
Ť				1											
+	with roo	k frogmente et 9.5				11		32	2	•••••					
Ť		k hagments at 6.5		7		16 16			•••••	••••••					
145 - 10	0 +	Boring terminated at 10 ft.	/	1	-				••••••	10 -					
Ť		ç													
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-									•••••						
†	_								:						
140 - 19	5								•••••	15 -					
I															
I															
135 - 20	0									20 -					
155 2										: 20					
130 - 2	5									25 -					
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125 - 30	0									30 -					
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_															
+															
120 - 39	5									35					
+															
1 1/40				1				. :	•	•					
1-1/4" pvc j 4" pipe was	pipe was installed s installed to 3' in	a jor 24hr groundwater reading. h the alternate hole INF-5A.													

GEOTECH		PROJECT: Lansdowne Elementary School						PROJE	CT NO.:	3	362216		
		CLIENT: Grimm and Parker											
ĔŇĞĬŇĔ	ËRS.	PROJECT LOCATION: 2301 Alma Road, Baltimore, MD											
INC. LOCATION: see boring location plan										1	151		
								_ LOGGE	D BY: _		JP		
	/M-6	DRILLING METHOD: Hollow Stem Auger		DATE: 3-9-16								5	
NO. 5V		DEPTH TO - WATER> INITIAL: \neq dry	<u>y A</u>	FTEF	R 24 F	IOURS	S: ₹	3.0'	_ CAV	NG> _	<u> </u>	0.0'	
uoi 4 a				hic	Ę	tion n/hr	ts <		TEST R	ESULT	<u>S</u>		
levai & Dept		Description			stratu	filtra ate, i	filtra tte, i Blov	Plastic Lir Water Co	nit	*	Liquic	d Limit	
Ξ				0	0	Ra Ra		Penetratio	n - ∆				
⊤ 0	0 to a coll						3	<u>10</u> 굿	20	<u>30 4</u>	0 5	0	
150 —	2" topsoli Brown to d	ark brown sandy lean clay (Ell I.) m	oist				4 4	8		:		- -	
+	Diowirto d		0101	***						•			
+ =							2 3	6					
+							3						
— 5							2	54				5 -	
145 —							2 3			••••••			
+													
+		0.51							••••••				
+	Brown san	dy lean CLAY (CL), moist	-8.5				4 7	14 🛆					
+ 10 -	· ·	Poring terminated at 10 ft				-	7			: : :		10 -	
140 —		Boring terminated at 10 ft.											
+													
+										: :			
+													
- 15										: :		15 -	
135 —										••••••			
+													
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- 20												20 -	
130 —													
+													
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+										:			
— 25												25 -	
125 —										:			
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— 30										:		30 -	
120 —										:			
+									· · · · · · · · · · · · · · · · · · ·	:			
+										:	· · · · · · · · ·		
+										:	· · · · · · · · ·		
- 35								· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	:	· · · · · · · · ·	35 -	
115 —										•••••			
1-1/4" myc nin	e was installed	d for 24hr groundwater reading						L					
4" pipe was in	stalled to 2' in	the alternate hole INF-6A.											

GEOTECH			PROJECT: Lansdowne Elementary School						JECT	NO.:	3	62216			
		СН	CLIENT: Grimm and Parker	_		-									
FNGINFERS PROJECT LOCATION: 2301 Alma Road, Baltimore, MD															
LOCATION: see boring location plan							ELE\	ELEVATION: 145			145				
DRILLER: Recon Drilling, Inc.							LOG	GED E	3Y:		JP				
LOG	OF B	ORING	DRILLING METHOD: Hollow Stem Auger							DATE	:	3-11-1	6		
N	o. SW	/M-7	DEPTH TO - WATER> INITIAL: ♀ dry	AFTE	R 24 H	HOUR	S: ₹	2	2.0'	CAVI	NG> 🤇	2	3.0'		
uc			-	υ	Ę	hr h			Т	EST R	ESULT	S			
Elevati & Deptr (feet)			Description	Graphi	Stratur	Infiltrati Rate. in	Blow Counts	Plastic Water Penetr	Limit Conte ation -	nit		— Liquid Li			
145 -	- o							10) 2	0 3	0 4	0 5	50		
-	_	2" topsoil					2	4	_				U		
-		Brown to d	ark brown sandy lean clay (FILL), moist				2					:			
-		- with grav	vel at 2.5'				4	 	23	32		•			
_		- obstruct	ion at 5'				4 19				•	:	:		
	_							:		:	:	:			
140 -	- 5		Boring terminated at 5 ft.			1		:		•	•	•••••••••••••••••••••••••••••••••••••••	5-		
-								:		•••••	••••••	:			
-	-									• • • • • • •	•••••	•			
-	-							:		•••••		:			
-	-									•••••	• • • • • • • • •	••••••			
135 -	- 10							:		•••••	••••••	:	10 -		
-	-														
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+	-										• • • • • • • •				
	-									•		:	: 		
130 -	- 15												15 -		
-	-									•••••					
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-	_									•	• • • • • • • • • •	• •			
-	-												:		
125 -	- 20										• • • • • • • • •	•	20 -		
=	-									•••••	•				
-	_														
-												:			
-	L									: : :	: : :	•	<u>.</u>		
120 -	25									•		:	25 -		
120	2.5									•	•	•	20		
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-								:							
-	-							:		•••••	•••••	•••••••••••••••••••••••••••••••••••••••			
-	-									• • • • • • • •	• • • • • • • • •	•			
115 -	- 30									• • • • • • • •	•••••	••••••	30 -		
-	-									•••••	•••••	•			
-	†					1				•••••		••••••			
-	+					1					•	•••••			
-	+ I										:	:	:		
110 -	- 35					1				• • • • • • • • •	:	:	35 -		
-	+									•	:	:	: :		
split sp	00n sav	nnlar broken	due to obstruction at 5.0' and having was to γ	minate		1									
spin spi	oon sun	πριεί υτοκεί l	and to obstruction at 5.0 and boring was left	muut	и.										

GEOTECH		PROJECT: Lansdowne Elementary School					PRO	JECT	NO.:	3	362216				
		CLIENT: Grimm and Parker	_		-										
FNGINF	FRS	PROJECT LOCATION: 2301 Alma Road. Baltimore. MD													
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SECTION 02 41 00 - DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Abandonment and removal of existing utilities and utility structures.
- C. Items to be salvaged by Owner prior to demolition.

1.2 **DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- C. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- E. Demolish: Tearing down, destruction, breakup, razing or removal of the whole or part of a building or structure, or free standing machinery or equipment that is directly related to the function of the structure.
- F. Recycle: Recovery of demolition waste for subsequent processing in preparation for reuse.

1.3 OWNERSHIP OF REMOVED MATERIALS

- A. Prior to demolition operations, the Owner reserves the right to salvage any items that otherwise would be part of the demolition; the Owner will remove equipment, material and fixtures they wish to retain.
- B. After demolition operations begin, equipment, material and fixtures indicated for demolition become the property of the Contractor to be removed, salvaged or disposed of by the Contractor.

1.4 RELATED REQUIREMENTS

- A. Section 01 10 00 Summary: Limitations on Contractor's use of site and premises.
- B. Section 01 50 00 Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- C. Section 01 70 00 Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- D. Section 01 74 19 Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.5 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Predemolition Phtographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations.

- C. Site Plan showing:
 - 1. Areas for temporary construction and field offices.
- D. Qualification Data: For refregerant recovery technician.
- E. Schedule of Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
- F. Informational Submittals:
 - 1. Submit shop drawings showing shoring, bracing, and temporary supports for the existing and re-installed structure as appropriate.
 - 2. Design of Bracing and Support: Submit engineering calculations of shoring and bracing designs.
 - a. Shoring, bracing and support shall be designed to maintain existing lines and surfaces without deflection during work; design shall be in accordance with gravity dead, live and wind load resistance requirements of the jurisdiction.
 - b. Design shall be sufficient for existing and new material loads and anticipated construction loads.
 - c. Stresses on supporting structure shall not exceed safe, commonly allowable stresses for the materials in consideration of their age and conditions.
 - 3. Provide signed and sealed certification of professional engineer licensed in the State of Maryland responsible for the preparation or review of the shop drawings and design calculations.
 - 4. Construct shoring, bracing and support in accordance with design submittal and proper and standard construction practice.
- G. Closeout Submittals:
 - 1. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
 - 2. Inventory: Submit a list of items that have been removed and salvaged.
 - 3. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
 - 4. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.

- E. Predemolition Conference: Conduct conference at Project site to comply with requirements in the Contract Documents.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.7 PROJECT CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Storage or sale of removed items or materials on-site is not permitted.
- D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 OWNER SALVAGED ITEMS

- A. The following items will be salvaged by the Owner prior to demolition:
 - 1. All printers and copiers.
 - 2. All Laptops/desktops, monitors and attached peripherals.
 - 3. Projectors and the electronics from any interactive boards mounted on the walls.
 - 4. Computer carts and/or projectors carts.
 - 5. All flat panel TVs or monitors for security and or offices/conference rooms.
 - 6. Intercom system and the Kronos units.
 - 7. Chair lift.
 - 8. Technology items:
 - a. Network switches.
 - b. Wireless equipment.
 - c. Servers.
 - d. Fiber optic equipment.
 - e. UPS units.
 - f. Telephone equipment (from the offices).
 - 9. All kitchen equipment except for exhaust hood and 3 compartment sink will be salvaged by Owner.
 - 10. All furniture.

1.9 CONTRACTOR SALVAGED ITEMS

- A. The following items will be salvaged by the Contractor prior to demolition:
 - 1. Lansdowne Police Athletic League site sign, located along Alma Road. Sign shall be store, protected, and reinstalled at location as directed by Owner during Phase 1 of construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 3. Provide, erect, and maintain temporary barriers and security devices.
 - 4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 5. Do not close or obstruct roadways or sidewalks without permit.
 - 6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 - 7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements that are not to be removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.

3.2 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.3 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 Waste Management.
- C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

SECTION 02 41 13 – SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Requirements of the General Provisions apply to all work under this section.
- B. General Conditions of the Baltimore County Board of Education's Specifications for Site Development.
- C. Baltimore County Department of Public Works Standard Details for Construction dated 2007 and as amended.
- D. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Architect for consideration. Those judged to be equal to that specified will receive written approval.

1.2 SUMMARY

- A. This Section requires removal and disposal, off site, of the following:
 - 1. Entrance drive, parking, structures, utilities, and adjacent site improvements to limits indicated on drawings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Summary of Work" for use of the building and phasing requirements.
 - 2. Division 2 Section "Demolition" for cutting and patching procedures for selective building demolition operations.
 - 3. Division 1 Section "Construction Progress Documentation" for demolition schedule requirements.
 - 4. Division 1 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures for selective demolition operations.
 - 5. Division 1 Section "Construction Waste Management and Disposal" for LEED requirements relating to demolition.
 - 6. Division 32 Section "Planting" for protecting trees remaining on-site.
 - 7. Division 31 Section "Site Clearing" for site clearing and removing above, and below, grade improvements.
 - 8. Division 31 Section "Excavation and Filling" for soil materials, excavating, backfilling, and site grading.
 - 9. Division 23 Sections for cutting, patching, or relocating mechanical items.
 - 10. Division 26 Sections for cutting, patching, or relocating electrical items.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Proposed schedule of operations coordination for shutoff, capping, and continuation of utility services as required.
 - 1. Provide a detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
- C. Photographs of existing adjacent structures and site improvements.

1.4 JOB CONDITIONS

- A. Demolition Phasing
 - 1. The contractor shall prepare and submit a demolition/construction staging plan to the Baltimore County Public Schools for approval prior to beginning any construction.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of demolition work.
- C. Salvage Materials: Items of salvable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
 - 1. Storage or sale of removed items will not be permitted on site.
 - 2. Refer to Section 02 41 00 for Owner's salvage list of items in the building.
- D. Explosives: Use of explosives will not be permitted.
- E. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Protections: Ensure safe passage of persons around area of demolition. Conduct operations to prevent damage to adjacent buildings, structures, and other facilities and injury to persons.
- G. Damages: Promptly repair damages caused to adjacent facilities by demolition operations.
- H. Utility Services: Maintain existing utilities indicated to stay in service and protect against damages during demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or used facilities, except when

authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

I. Utility Services: Refer to Division 23 and 26 sections for disconnecting, removing, and capping of utility services. Do not start demolition work until utility disconnections have been completed and verified in writing.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.1 DEMOLITION

- A. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air. Comply with governing regulations pertaining to environmental protection.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
- B. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

3.2 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Remove weekly from site accumulated debris, rubbish, and other materials resulting from demolition operations.
 - 1. Burning of combustible materials from demolished structures will not be permitted on site.
- B. Removal: Transport materials removed from demolished structures and legally dispose of off site.

SECTION 03 10 00 - CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

1.2 RELATED REQUIREMENTS

A. Section 05 12 00 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.

1.3 REFERENCE STANDARDS

- ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.
- B. ACI 301 Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
- C. ACI 318 Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute; 2011.
- D. ACI 347 Guide to Formwork for Concrete; American Concrete Institute; 2004.
- E. ASME A17.1 Safety Code for Elevators and Escalators; The American Society of Mechanical Engineers; 2013.
- 1.4 SUBMITTALS
 - A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on void form materials.
 - C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.
 - 1. Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork; stamped and signed by engineer registered in the State in which the Project is located.
 - 2. Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.
 - 3. Indicate location of all slab joint types.
 - D. LEED Submittals: If any wood or wood-based form materials, including supports, are permanently installed in the project, submit documentation required for sustainably harvested wood as specified in Section 01 60 00 and appropriate forms.

1.5 QUALITY ASSURANCE

- A. Domestic Origin: Consistent with the Maryland Annotated Code, Article 78A known as the "Buy American Steel" Act of the General Assembly of Maryland, Acts of 1978, provide steel manufactured in the United States of America.
- B. Perform work of this section in accordance with ACI 347, ACI 301, and ACI 318.
 - 1. Maintain one copy of standards on project site.

PART 2 PRODUCTS

2.1 FORMWORK - GENERAL

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-inplace concrete work.
- B. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.
- C. Comply with applicable State and local codes with respect to design, fabrication, erection, and removal of formwork.
- D. Comply with relevant portions of ACI 347, ACI 301, and ACI 318.

2.2 FORM MATERIALS

- A. Form Materials: At the discretion of the Contractor.
- 2.3 REMOVABLE PREFABRICATED FORMS
 - A. Preformed Steel Forms: Minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
 - B. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
 - C. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; 2 inches thick.
 - D. Pattern for cast-in-place concrete site wall: Fitzgerald Formliners, Formliner Pattern 16021; www.formliners.com.

2.4 FORMWORK ACCESSORIES

- A. Form Ties: Snap-off type, galvanized metal, fixed length, cone type, with waterproofing washer, 1 inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface.
- B. Form Release Agent: Colorless mineral oil that will not stain concrete, absorb moisture, impair natural bonding of concrete finish coatings, or affect color characteristics of concrete finish coatings. Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
- C. Corners: Chamfered, rigid plastic or wood strip type; 3/4 x 3/4 inch size; maximum possible lengths.
- E. Dovetail Anchor Slot: Galvanized steel, at least 22 gage, 0.0299 inch thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- F. Flashing Reglets: Galvanized steel, at least 22 gage, 0.0299 inch thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- G. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- H. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 12 00.
- I. Waterstops: Preformed mineral colloid strips, 3/4 inch thick, moisture expanding.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.2 EARTH FORMS

- A. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.
- 3.3 ERECTION FORMWORK
 - A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
 - B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
 - C. Provide chamfer strips on external corners of beams, joists, and columns.
 - D. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.
 - E. Coordinate this section with other sections of work that require attachment of components to formwork.
 - F. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.
- 3.4 APPLICATION FORM RELEASE AGENT
 - A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
 - B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
 - C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
- B. Locate and set in place items that will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.6 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

- B. Clean formed cavities of debris prior to placing concrete.
 - 1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
 - 2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.7 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 117, unless more strigent tolerances are required within the Contract Documents.
- B. Construct and align formwork for elevator hoistway in accordance with ASME A17.1.

3.8 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
- C. Do not reuse wood formwork more than 3 times for concrete surfaces to be exposed to view. Do not patch formwork.
- 3.9 FORM REMOVAL
 - A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
 - B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
 - C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

SECTION 03 20 00 - CONCRETE REINFORCING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.
- 1.2 REFERENCE STANDARDS
 - A. ACI 301 Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
 - B. ACI 318 Building Code Requirements For Structural Concrete and Commentary; American Concrete Institute International; 2011.
 - C. ACI SP-66 ACI Detailing Manual; American Concrete Institute International; 2004.
 - D. ASTM A184/A184M Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement; 2006 (Reapproved 2011).
 - E. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2015.
 - F. ASTM A1064/A1064M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2013.
 - G. CRSI (DA4) Manual of Standard Practice; Concrete Reinforcing Steel Institute; 2009.
 - H. CRSI (P1) Placing Reinforcing Bars; Concrete Reinforcing Steel Institute; 2011.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
- D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.
- E. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of recycled content type and percentage, steel mill process, location and extraction/recovery of primary raw materials, location of mill, location of fabrication and costs.
 - 2. All reinforcing steel shall be extracted/recovered/harvested and manufactured within 500 miles of the project site.

1.4 QUALITY ASSURANCE

- A. Domestic Origin: Consistent with the Maryland Annotated Code, Article 78A known as the "Buy American Steel" Act of the General Assembly of Maryland, Acts of 1978, provide steel manufactured in the United States of America.
- B. Perform work of this section in accordance with CRSI (DA4), CRSI (P1), ACI 301, ACI SP-66, ACI 318, and ASTM A 184/A 184M.
 - 1. Maintain one copy of each document on project site.

- C. Provide Architect with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
- D. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

- 2.1 REINFORCEMENT
 - A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Deformed billet-steel bars.
 - 2. Unfinished.
 - 3. Recycled Content: Provide steel with minimum 90 percent total recycled content, including at least 60 percent post-consumer recycled content.
 - 4. Regional Materials: Provide at least 75 percent of steel manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.
 - B. Steel Welded Wire Reinforcement (WWR): Galvanized, deformed type; ASTM A1064/A1064M.
 - 1. Form: Flat Sheets.
 - 2. Mesh Size and Wire Gage: As indicated on drawings.
 - C. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3. Supports and Spacers in Contact with the Ground:
 - a. Precast concrete supports with a surface area of not less than 4 in2, a compressive strength equal to or greater than the specified compressive strength of the concrete being placed, and embedded tie wires for securing the reinforcement.
 - b. Chairs with plastic components and sand plates.
 - c. Spacers: Plastic
 - 4. Provide stainless steel components for placement within 1-1/2 inches of weathering surfaces.

2.2 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) Manual of Standard Practice.
- B. Welding of reinforcement is not permitted.
- C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
 - 1. Review locations of splices with Architect.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement before and during concrete placement. Do not deviate from required position.
- B. Clean reinforcement of loose rust, mill scale, earth, ice and other foreign materials that would reduce bond to concrete.
- B. Do not displace or damage vapor barrier.

- C. Accommodate placement of formed openings.
- D. Conform to structural drawings for concrete cover over reinforcement.

3.2 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 40 00, will inspect installed reinforcement for conformance to contract documents before concrete placement. Inspection services shall conform to the Statement of Special Inspections noted in the structural drawings.

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete for composite floor construction.
- B. Floors and slabs on grade.
- C. Concrete foundation walls and building walls.
- D. Footings.
- E. Concrete piers
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads.

1.2 RELATED REQUIREMENTS

- A. Section 03 10 00 Concrete Forming and Accessories.
- B. Section 03 20 00 Concrete Reinforcing.
- C. Section 03 35 13 High Tolerance Concrete Floor Finishing.
- D. Section 07 92 00 Joint Sealants: Products and installation for sealants for saw cut joints and isolation joints in slabs.
- E. Section 03 39 00 Concrete Curing.
- F. Section 07 95 13 Expansion Joint Cover Assemblies.

1.3 REFERENCE STANDARDS

- A. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- B. ACI 211.2 Standard Practice for Selecting Proportions for Structural Lightweight Concrete; American Concrete Institute International; 1998 (Reapproved 2004).
- C. ACI 301 Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
- D. ACI 302.1R Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).
- E. ACI 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- F. ACI 305R Hot Weather Concreting; American Concrete Institute International; 2010.
- G. ACI 306R Cold Weather Concreting; American Concrete Institute International; 2010.
- H. ACI 318 Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.
- I. ASTM C33/C33M Standard Specification for Concrete Aggregates; 2013.
- J. ASTM C39/C39M Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- K. ASTM C94/C94M Standard Specification for Ready-Mixed Concrete; 2014.
- L. ASTM C150/C150M Standard Specification for Portland Cement; 2012.
- M. ASTM C173/C173M Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.

- N. ASTM C260/C260M Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- O. ASTM C330/C330M Standard Specification for Lightweight Aggregates for Structural Concrete; 2014.
- P. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete; 2013.
- Q. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2012.
- R. ASTM C881/C881M Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2013.
- S ASTM C 989 Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
- T ASTM C 1077 Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
- U. ASTM C1107/C1107M Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink); 2014.
- V. ASTM C1240 Standard Specification for Silica Fume Used in Cementitious Mixtures; 2012.
- W. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- X. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.
- Y. ASTM E 329 Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials used in Construction.
- Z. IBC 2015 International Building Code.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- C. Samples: Submit samples of under-slab vapor retarder to be used.
- D. LEED Submittal: If any ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used; use LEED New Product Content Form.
- E. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of location of plant, location of material quarries and costs.
- F. LEED Submittal: Provide documentation of VOC content in g/L for adhesives and sealants applied within the building waterproofing envelope.
- G. Design Mixtures:
 - 1. Submit for each concrete mixture.
 - 2. Submit alternate design mixtures when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
 - 3. Indicate amounts of mixing water to be withheld for later addition at Project site.

1.5 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.
- D. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1.
 - 2. Personnel performing laboratory tests shall be an 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.
- E. Integrally Colored Concrete Mockups:
 - 1. At location on Project selected by Architect, place and finish 4 by 4 feet area.
 - 2. For accurate color, the quantity of concrete mixed to produce the sample should not be less than 3 cubic yards (or not less than 1/3 the capacity of the mixing drum on the ready-mix truck) and should always be in full cubic yard increments. Excess material shall be discarded according to local regulations.
 - 3. Construct mockup using processes and techniques intended for use on permanent work, including curing procedures. Include samples of control, construction, and expansion joints in sample panels. Mockup shall be produced by the individual workers who will perform the work for the Project.
 - 4. Mockup to demonstrate textures specified.
 - 5. Retain samples of cements, sands, aggregates and color additives used in mockup for comparison with materials used in remaining work.
 - 6. Accepted mockup provides a visual standard for colored concrete work.
 - 7. Mockup shall remain through completion of work for use as a quality standard for finished work.
 - 8. Remove mockup when directed.

1.06 DELIVERY, STORAGE AND HANDLING OF COLORED CONCRETE ADMIXTURE

A. Colored Admixture: Comply with manufacturer's instructions. Deliver colored admixtures in original, unopened packaging. Store in dry conditions.

1.07 PROJECT CONDITIONS FOR PLACEMENT OF COLORED CONCRETE

- A. Integrally Colored Concrete Environmental Requirements:
 - 1. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.
 - 2. Avoid placing concrete if rain, snow, or frost is forecast within 24-hours. Protect fresh concrete from moisture and freezing.
 - 3. Comply with professional practices described in ACI 305R and ACI 306R.

1.08 PRE-JOB CONFERENCE

- A. One week prior to placement of integrally colored concrete a meeting will be held to discuss the Project and application materials.
 - 1. The Architect, General Contractor, Subcontractor, Ready-Mix Concrete Representative, and a Manufacturer's Representative shall be present.

PART 2 PRODUCTS

- 2.1 FORMWORK
 - A. Comply with requirements of Section 03 10 00.

2.2 REINFORCEMENT

A. Comply with requirements of Section 03 20 00.

2.3 CONCRETE MATERIALS

- A. Regional Materials: Provide cement and aggregate manufactured and of primary raw materials extracted or recovered within 500-mile radius of Project Site.
- B. Cement: ASTM C150, Type I Normal Portland type.1. Acquire all cement for entire project from same source.
- C. Fine and Coarse Aggregates: ASTM C 33.
 - 1. Acquire all aggregates for entire project from same source.
 - 2. Regional Content: Extracted/recovered and processed within 500 mile radius of project site.
- D. Lightweight Aggregate: ASTM C330/C330M.
 - 1. Regional Content: Extracted/recovered and processed within 500 mile radius of project site.
- E. Fly Ash: ASTM C618 Class F.
- F. Ground Granulated Blast-Furnace Slag (GGFB): ASTM C 989, Grade 100 or 120.
- G. Calcined Pozzolan: ASTM C618, Class N.
- H. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.
- I. Water: Clean and not detrimental to concrete.

2.4 CHEMICAL ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.

- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.

2.5 ACCESSORY MATERIALS

- A. Underslab Vapor Barrier: Product complying with ASTM E 1745, Class A.
 - 1. Maximum Permeance ASTM E96: 0.01 perms (English).
 - 2. Provide standard accessories and tape for complete system.
 - 3. Acceptable Products:
 - a. Basis-of-Design: Stego Wrap (15-mil) Vapor Barrier by STEGO INDUSTRIES LLC.
 - b. Perminator 15 mils by W.R. Meadows, Inc.
 - c. Moistop Ultra 15 by Fortifiber.
 - 4. Single ply polyethylene is prohibited.
 - 5. Basis-of-Design Accessories:
 - a. Seams:
 - 1) Stego Tape by Stego Industries LLC, www.stegoindustries.com.
 - b. Penetrations of Vapor barrier:
 - 1) Stego Mastic by Stego Industries LLC, www.stegoindustries.com.
 - 2) Stego Tape by Stego Industries LLC, www.stegoindustries.com.
 - c. Perimeter/edge seal:
 - 1) Stego Crete Claw by Stego Industries LLC, www.stegoindustries.com .
 - 2) Stego Term Bar by Stego Industries LLC, www.stegoindustries.com.
 - 3) StegoTack Tape (double sided) by Stego Industries LLC, www.stegoindustries.com.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
 - 2. Minimum Compressive Strength at 28 Days: 7,000 psi.
- C. Curing Materials: Comply with requirements of Section 03 39 00.

2.6 BONDING AND JOINTING PRODUCTS

- A. Epoxy Bonding System:
 - 1. Complying with ASTM C881/C881M and of Type required for specific application.
- B. Waterproofing Admixture Slurry: Slurry coat of Portland cement, sand, and crystalline waterproofing additive, mixed with water in proportions recommended by manufacturer to achieve waterproofing at cold joints in concrete.
 - 1. Products:
 - a. Aquafin, Inc: www.aquafin.net.
 - b. Xypex Chemical Corporation: www.xypex.com.
 - c. Kryton International Inc.; www.kryton.com.
- C. Slab Isolation Joint Filler: Non-extruding, resilient asphalt impregnated fiberboard, cork or flexible foam, thickness as indicated on drawings and full depth of slab less 1/2 inch; tongue and groove profile.
 - 1. Material: ASTM D1751, cellulose fiber.
- D. Self-Expanding Strip Waterstops: Manufactured rectangular or trapezoidal strip, sodium bentonite or other hydrophilic material for adhesive bonding to concrete.
 - 1. Available Products:
 - a. Volclay Waterstop-RX; Colloid Environmental Technologies Co.

- b. Conseal CS-231; Concrete Sealants Inc.
- c. Swellseal Joint; De Neef Construction Chemicals (U.S.) Inc.
- d. Hydrotite; Greenstreak.
- e. Mirastop; Mirafi Moisture Protection, Div. of Royal Ten Cate (USA), Inc.
- f. Adeka Ultra Seal; Mitsubishi International Corporation.
- g. Superstop; Progress Unlimited Inc.
- E. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with minimum 1 inch diameter holes for conduit or rebars to pass through at 6 inches on center; ribbed steel stakes for setting.
 - 1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
 - 2. Height: To suit slab thickness.
- F. Sealent and Primer: As specified in Section 07 92 00.
- 2.7 CONCRETE MIX DESIGN
 - A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
 - 1. Replace no less than 30% and no more than 50% of Portland cement in structural concrete with approved pozzolanic materials.
 - 2. Fly-ash or Calcined Pozzolan Content: Not to exceed 25% of cementitious material by weight.
 - 3. GGBS Content: not to exceed 50% of total cementitious material.
 - 4. Silica Fume Content: not to exceed 10% of total cementitious material.
 - 5. Obtain approval in advance before submitting mix containing any other pozzolanic substances.
 - B. Proportioning Structural Lightweight Concrete: Comply with ACI 211.2 recommendations.
 - 1. Replace no less than 30% and no more than 50% of Portland cement in structural concrete with approved pozzolanic materials.
 - 2. Fly-ash or Calcined Pozzolan Content: Not to exceed 25% of cementitious material by weight.
 - 3. GGBS Content: not to exceed 50% of total cementitious material.
 - 4. Silica Fume Content: not to exceed 10% of total cementitious material.
 - 5. Obtain approval in advance before submitting mix containing any other pozzolanic substances.
 - C. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
 - D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
 - E. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
 - 2. Water-Cement Ratio: Maximum 58 percent by weight. Maximum 45 percent by weight for exterior concrete.
 - 3. Entrained air content for trowel-finished interior slabs shall not exceed 3%, determined in accordance with ASTM C 173/C 173M.
 - 4. Entrained air content for footings shall not exceed 4.5%, determined in accordance with ASTM C 173/C 173M

- 5. Air Content for Exterior Exposed Concrete: Add air entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows with a tolerance of plus 1 or minus 1.5%, unless otherwise indicated.
 - a. Air Content: 6% entrained air, determined in accordance with ASTM C 173/C 173M.
- 6. Maximum Slump: 4 inches.
- 7. Maximum Aggregate Size: 1 inch.

2.8 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.
- B. Do not add water to concrete during delivery, at the project site or during placement except as predetermined by concrete mix, unless approved by the Architect.

2.9 COLORED CONCRETE ADMIXTURE

- A. Acceptable Manufacturer
 - 1. Basis-of-Design for colored concrete: L.M. Scofield Company; www.scofield.com.
- B. Materials
 - 1. Colored Admixture for Integrally Colored Concrete: CHROMIX P[®] Admixture and CHROMIX ML[®]; L.M. Scofield Company.
 - a. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are limeproof and ultra-violet resistant.
 - b. Colored admixture shall conform to the requirements of ACI 303.1, ASTM C979, ASTM C494 and ASHTO M194.

C. COLORS AND TEXTURE

- 1. Concrete Color:
 - a. Cement: Color shall be gray.
 - b. Sand: Color shall be locally available natural sand.
 - c. Aggregate: Concrete producer's standard aggregate complying with specifications.
 - d. Colored Admixture: To be selected by Architect from manufacturers full range.
- 2. Curing Compound: Color to match integrally colored concrete.
- 3. Textures: Sponge and Medium/Heavy Sandblasted, locations selected by Architect.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.2 PREPARATION

- A. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
- B. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.

- C. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- D. Install vapor barrier in accordance ASTM E1643.
 - 1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
 - 2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
 - a. Option 1: Seal vapor barrier to the entire slab perimeter using manufacturers textured seal tape, per manufacturer's instructions.
 - b. Option 2: Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided tape, or both termination bar and tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
 - 3. Overlap joints 6 inches and seal with manufacturer's seam tape.
 - 4. Apply seam tape to a clean and dry vapor barrier.
 - 5. Seal all penetrations (including pipes) per manufacturer's instructions.
 - 6. Avoid the use of non-permanent stakes driven through vapor barrier.
 - 7. If non-permanent stakes are driven through vapor barrier, repair as recommended by vapor barrier manufacturer.
 - 8. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

3.3 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- D. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.4 SLAB JOINTING

- A. Locate joints as indicated on the drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
- D. Separate slabs on grade from vertical surfaces with joint filler.
- E. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- F. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 90 05 for finish joint sealer requirements.
- G. Install joint devices in accordance with manufacturer's instructions.
- H. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- I. Install joint device anchors for expansion joint assemblies specified in Section 07 95 13. Maintain correct position to allow joint cover to be flush with floor and wall finish.

- J. Apply sealants in joint devices in accordance with Section 07 90 05.
- K. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- L. Place concrete continuously between predetermined expansion, control, and construction joints.
- M. Do not interrupt successive placement; do not permit cold joints to occur.
- N. Place floor slabs in checkerboard or saw cut pattern indicated.
- O. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- 3.5 FLOOR FLATNESS AND LEVELNESS TOLERANCES
 - A. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.6 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of Section 03 35 13.
- 3.7 CURING AND PROTECTION
 - A. Comply with requirements of Section 03 39 00.
- 3.8 FIELD QUALITY CONTROL
 - A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
 - B. Provide free access to concrete operations at project site and cooperate with appointed firm.
 - C. Provide free access to concrete operations at project site and cooperate with appointed firm; inspection to occur for:
 - 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. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
 - E. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
 - F. Compressive Strength Tests: ASTM C 39/C 39M.
 - 1. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure five standard cylinder specimens for each composite sample fifth cylinder will be held in reserve.

- 2. Test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
- 3. Obtain test samples for every 75 cu yd or less of each class of concrete placed.
- 4. A compressive-strength test shall be the average compressive strength from all specimens obtained from same composite sample and tested at age indicated.
- 5. 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.
- G. Take two additional 6"x12" or three additional 4"x8" test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents. Test at 28 days.
- H. Perform one slump test, at point of discharge for each set of test cylinders taken, following procedures of ASTM C 143/C 143M.
- I. Perform air content test for each set of test cylinders taken, following procedures of ASTM C 231.
- J. Perform unit weight test of structural lightweight concrete for each set of test cylinders taken, following procedures of ASTM C 567.
- K. Test concrete temperature each hour when air temperature is 40 degrees F and below and when 80 degrees F and above, and for each set of test cylinders taken, following procedures of ASTM C 1064/C 1064M.

3.9 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
 - 1. Testing and inspecting agency will make additional tests of concrete when test results indicate that slump, compressive strengths, or other requirements have not been met, as directed by Architect.
 - 2. 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.
 - 3. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 - 4. Correct deficiencies that test reports and inspections indicate do not comply with specified requirements.
- B. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

SECTION 03 35 13 - CONCRETE FLOOR FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Finishing slabs on grade and monolithic floor slabs.
- B. Surface treatment with concrete hardener and sealer.

1.2 REFERENCE STANDARDS

- A. ACI 301 Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.
- B. ACI 302.1R Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).
- C. ASTM E1155 Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. LEED Submittal: Provide documentation of VOC content in g/L for primers, sealers and floor coatings applied within the building waterproofing envelope.
- C. Submit floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- D. Maintenance Data: Provide data on maintenance renewal of applied coatings.
- E. Product Data: Provide data on concrete hardener and sealer, including information on compatibility of different products and limitations.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.1. Maintain one copy on project site.
 - 1. Maintain one copy on project site.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.6 PROJECT CONDITIONS

- A. Coordinate the work with concrete floor placement and concrete floor curing.
- 1.7 FIELD CONDITIONS
 - A. Maintain ambient temperature of 50 degrees F minimum.
 - B. Provide ventilation sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Concrete Floor Finishes:
 - 1. Dayton Superior Corporation: www.daytonsuperior.com.
 - 2. L&M Construction Chemicals, Inc: www.lmcc.com.
 - 3. BASF Construction Chemicals-Building Systems: www.chemrex.com.

2.2 COMPOUNDS - HARDENERS AND SEALERS

- A. Chemical Hardener: Clear, chemically reactive, waterborne solution of inorganic siliconate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. Provide for interior slabs not receiving a subsequent finish (remaining exposed concrete); regardless of the Finish Schedule indicating concrete hardener or not.
 - 2. VOC Content: Not to exceed 200 g/L.
 - 3. Acceptable Products:
 - a. Ashford Formula, Concrete Chemical Company, Inc.
 - b. Seal Hard, L & M Construction Chemicals, Inc.
 - c. Titan Hard, Burke Construction Chemicals.

PART 3 EXECUTION

3.1 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1R.
- B. Steel trowel surfaces that will receive carpeting, resilient flooring, seamless flooring, thin set terrazzo, or thin set ceramic tile.
- C. Steel trowel surfaces that are scheduled to be exposed.
- D. Fine-broomed finish for exterior slabs.
- 3.2 FLOOR SURFACE TREATMENT
 - A. Apply hardener to floor surfaces in accordance with manufacturer's instructions.
- 3.3 TOLERANCES
 - A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for flatness.
 - B. Measure for F(F) and F(L) tolerances for floors in accordance with ASTM E1155, within 48 hours after slab installation.
 - C. Finish concrete to achieve the following tolerances:
 - 1. Exposed to View and Foot Traffic: Ff 20 and Fl 15.
 - 2. Slabs to be Covered with Thin Floor Coverings (ie., resilient flooring): Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17.
 - 3. Slabs to be Covered with Wood Athletic Flooring: Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17.
 - 4. Slabs to be Covered with Carpet and Other Slabs: Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 20; with minimum values of flatness, F(F) 17; and of levelness, F(L) 15.
 - 5. The F(L) values listed above are not applicable to elevated slab on deck. Only F(F) values apply to elevated slabs.
 - D. Correct the slab surface if tolerances are less than specified.
 - E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

SECTION 03 39 00 - CONCRETE CURING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Initial and final curing of horizontal and vertical concrete surfaces.

1.2 REFERENCE STANDARDS

- A. ACI 301 Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.
- B. ACI 302.1R Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).
- C. ACI 305R Hot Weather Concreting; American Concrete Institute.
- D. ACI 306R Cold Weather Concreting; American Concrete Institute.
- E. ACI 308R Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- F. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete; 2007.
- G. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2007.
- H. ASTM D2103 Standard Specification for Polyethylene Film and Sheeting; 2008.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on curing compounds, moisture-retaining sheet, and polyethylene film, including compatibility of different products and limitations.
- B. LEED Submittal: Provide documentation of VOC content in g/L for concrete curing compound.
- 1.4 QUALITY ASSURANCE
 - A. Perform Work in accordance with ACI 301 and ACI 302.1R.

PART 2 PRODUCTS

- 2.1 MATERIALS
 - A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - B. Membrane Curing Compound: ASTM C309 Type 1 Clear or translucent, Class B.
 - 1. VOC content not to exceed 350 g/L.
 - C. Moisture-Retaining Sheet: ASTM C171.
 - 1. Curing paper, regular.
 - 2. Polyethylene film, clear, minimum nominal thickness of 0.0040 in..
 - 3. White-burlap-polyethylene sheet, weighing not less than 10 oz/per linear yd, 40 inches wide.
 - D. Polyethylene Film: ASTM D2103, 4 mil thick, clear.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to be cured.
- 3.2 EXECUTION HORIZONTAL SURFACES
 - A. Cure floor surfaces in accordance with ACI 308R.
 - B. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306 for cold-weather protection and ACI 305 for hot-weather protection during curing.
 - C. 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.
 - D. Cure floor surfaces in accordance with ACI 308.
 - E. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges; maintain in place for not less than 4 days.
 - F. Absorptive Moisture-Retaining Sheet: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place for 7 days.
 - G. Membrane Curing Compound: Apply curing compound in accordance with manufacturer's instructions in one coat.

3.3 EXECUTION - VERTICAL SURFACES

- A. Cure surfaces in accordance with ACI 308R.
- B. Cure surfaces in accordance with ACI 308.
- C. Membrane Curing Compound: Apply compound in accordance with manufacturer's instructions in one coat.

3.4 PROTECTION

A. Do not permit traffic over unprotected floor surface.

SECTION 04 20 00 - UNIT MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete Block.
- B. Clay Facing Brick.
- C. Outdoor Slate Chalkboard.
- D. Mortar and Grout.
- E. Reinforcement and Anchorage.
- F. Flashings.
- G. Lintels.
- H. Accessories.

1.2 REFERENCE STANDARDS

- A. ACI 530/530.1/ERTA Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.
- B. ASTM A82/A82M Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
- C. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A615/A615M Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.
- E. ASTM A641/A641M Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a.
- F. ASTM C67 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2011.
- G. ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units; 2011b.
- H. ASTM C140 Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2012.
- I. ASTM C144 Standard Specification for Aggregate for Masonry Mortar; 2011.
- J. ASTM C150/C150M Standard Specification for Portland Cement; 2012.
- K. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- L. ASTM C270 Standard Specification for Mortar for Unit Masonry; 2012.
- M. ASTM C404 Standard Specification for Aggregates for Masonry Grout; 2011.
- N. ASTM C476 Standard Specification for Grout for Masonry; 2010.
- O. ASTM C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2011.
- P. ASTM C979/C979M Standard Specification for Pigments for Integrally Colored Concrete; 2010.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. 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. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- E. Shop Drawings:
 - 1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.Fabricated
 - 2. Flashing: Detail inside/outside corner units, sill and head conditions; end-dam conditions; base-of-wall, lintel and low roof-to-wall conditions; and other special applications.
- F. Mix Designs: For each type of mortar and grout.
 - 1. Include description of type and proportions of ingredients.
 - 2. Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- G. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00; report recycled content for masonry units and reinforcement.
 - 1. Credit MR 5.1 and 5.2:
 - a. Provide product data indicating location of manufacturer and location of extraction/recovery of primary raw materials.
 - b. Include statement indicating cost for each regionally manufactured material.
 - 2. Credit MR 4.1 and 4.2: Product Data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
 - a. Contributions to this Credit include recycled content of fly ash and recycled content of steel reinforcement.
- H. LEED Submittals:
 - 1. Credit EQ 4.1: Product Data highlighting VOC content of cavity wall insulation adhesive.
- I. Coordinate with Construction Waste Management requirements.
- J. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.
- K. Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with hot-weather requirements.
- L. Temporary Bracing Plan:
 - 1. Provide a temporary bracing plan for the information-only of the Architect; plan to be submitted minimum two weeks prior to initiating masonry Work.
 - 2. The bracing plan must be based on the Mason Contractors Association of America's Standard Practice for Bracing Masonry Walls Under Construction, and Masonry Wall Bracing Design Handbook, or another industry recognized standard.
- 3. Bracing plan must be reviewed by a Professional Structural Engineer licensed in the State of Maryland; Professional Structural Engineer to provide a letter certifying his review of the plan and acknowledgement of its completeness.
- 4. The bracing plan and Professional Structural Engineer's letter must indicate project conditions unique to any referenced standard and provide for the unique bracing required for those conditions.
- 5. Maintain one copy of any industry standard referenced within the plan, on project site.

1.4 QUALITY ASSURANCE

- A. Masonry Contractor Qualification:
 - 1. Engage a trade contractor with at least 10 years experience in masonry construction of type and scope included in the construction documents.
 - 2. Demotrate experience by submitting to the Owner a list of at least 10 masonry projects of similar size, complexity and scope.
 - 3. Submit resumes of all key personnel that will be assigned to the Project; dedicate assigned personnel to the Project for the entire scope of Work.
- B. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.
 - 1. Maintain one copy of each document on project site.
- C. Fire-Resistance Ratings: Where indicated, provide materials identical to those assemblies with fire-resistance ratings conforming to the Standard Method for Determining Fire Resistance of Concrete and Masonry Assemblies, ACI 216.1-97/TMS-0216-07, National Concrete Masonry Association TEK 7-1A, and ASTM E-119, and acceptable to authorities having jurisdiction.
 - 1. Certification of concrete masonry units for fire ratings must be provided by the National Concrete Masonry Association or qualified independent testing agency.
 - 2. Provide Letter of Certification for aggregates used in mix design assuring compliance with ASTM C 33 and ASTM C 331.
 - 3. Provide mix design and determined equivalent thickness, for units incorporating recycled content materials.

1.5 MOCK-UP

- A. Mock-up: 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 for final unit of Work.
 - 1. Locate mockup on site within 4 weeks of Contract award in location as directed, by Architect.
 - 2. List of Material Used in Construction 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.
 - 3. Build mockup of typical wall.
 - a. Include exterior face brick wall with cast stone trim.
 - b. Include Aluminum Framed Storefront complying with requirements of Division 8 Section 08 43 13 with applicable window lintel detail.
 - c. Seal perimeter of window complying with requirements of Division 7 Section "Joint Sealers."

- d. Include sealant-filled control joints complying with requirements of Division 7 Section "Joint Sealers."
- e. Include metal panels as specified in Division 7.
- 4. Build mockup as detailed on the drawings.
- 5. Notify the Architect when mock-up is ready for inspection. Remove and replace defective and deficient parts of the wall as identified by the Architect, and replace until such time that all the work is acceptable to the Architect and Owner.
- 6. 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 PRE-INSTALLATION MEETING
 - A. Convene one week before starting work of this section.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
 - B. Store masonry units, cementitious materials, and preblended, dry mortar mix on elevated platforms in a dry location. If units are not stored in a nonclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
 - C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- 1.8 ENVIRONMENTAL REQUIREMENTS
 - 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 and hold cover securely in place.
 - 2. Where 1 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.
 - 3. Verify masonry protection at end of each day; inadequate protection by the trade contractor to be corrected or replaced by the Contractor, for proper protection; costs incurred by the Contractor is not the Owner's responsibility, but may be recovered under agreement with trade contractor.
 - 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 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.
- D. Cold and Hot Weather Requirements: Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 - 2. Special Shapes:
 - a. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 - b. Provide bullnose units for outside corners, unless otherwise indicated.
 - c. Bullnose units are not to be used at areas scheduled to be covered with tile.
 - 3. Load-Bearing Units: ASTM C90, normal weight.
 - 4. Recycled Content: Provide units having a minimum fly ash of 10 percent.
 - a. Provide testing and chain-of-custody certification recycled materials.
 - b. Properly modify the equivalent thickness of fire-rated concrete masonry units, as may be necessary due to the selection and percentage of recycled content materials.
 - 5. Regional Material: Provide concrete block manufactured and of raw materials extracted and/or recovered within 500 miles of project site.
- B. Decorative Block:
 - 1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 - 2. Type: Ground face.
 - a. Include heat treated clear acrylic coating for interior units.
 - 3. Special Shapes: Provide non-standard blocks configured for corners.
 - 4. Producers:
 - a. Betco Supreme.
 - b. Trenwyth Industries, an Oldcastle Company.
 - c. Nitterhouse Masonry Products, LLC.
 - d. EP Henry Corpration.
 - e. York Building Products Company, Inc.
 - f. New Holland Concrete.
 - g. Frederick Block.
 - 5. Shall meet ASTM C90 for solid load-bearing concrete masonry units and ASTM C55.
 - 6. Units shall be free of cracks, chips and other defects; no broken corners will be permitted.
 - 7. Produce units with integral water-repellant conforming to:
 - a. CMU producer shall be qualified by manufacturer of integral liquid polymeric CMU water-repellent.
 - b. Warranty:

- 1) Integral liquid polymeric CMU water-repellent shall be warranted by admixture manufacturer to be free of defects and to meet manufacturer's published physical and chemical properties.
- 2) CMU producer shall warrant that integral polymeric CMU water-repellent has been provided at an appropriate dosage rate in decorative block units shipped to this Project for use in exterior walls.
- 3) Installer shall warrant that decorative CMUs containing integral polymeric CMU water-repellent have been placed in exterior walls.
- c. Description: Integral liquid polymeric admixture, mixed with concrete during production of decorative CMUs, capable of attaining Class E Rating under ASTM E514, and no decrease in flexural strength or compressive strength of prisms when compared to "control", under ASTM E72.
- d. Project Standard: Dry-Block Integral Liquid Polymeric CMU Water-repellent admixture manufactured by Grace Construction Products.
- 8. Color Basis-of-Design: Oldcastle, Betco Supreme: Greystone.

2.2 BRICK UNITS

- A. Manufacturers Provide one of the following:
 - 1. Option 1: Triangle Brick Red Wirecut Ironspot, modular.
 - 2. Option 2: General Shale Waverly Ironspot, Lightweight modular
 - 3. Option 3: Forterra (formerly Hanson) Red Wire Cut Iron Spot, modular
- B. Facing Brick: ASTM C 216, Type FBS, Grade SW.
 - 1. Size: Modular, 7-5/8 inches long, 2-1/4 inches high, 3-5/8 inches deep.
 - 2. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
 - 3. Regional Material: Provide brick manufactured and of raw materials extracted and/or recovered within 500 miles of project site.

2.3 OUTDOOR SLATE CHALKBOARD

- A. Manufacturer: Buckinham Slate.
- B. Size: As inidicated on the drawings.
- C. Thickness: 3/4 inch.
- D. Finish: Honed.
- E. Fasteners: Type 304 Stainless Steel, split-tail fasteners.
 - 1. Model 10FH, 1 1/4 inches wide by 1/8 inch thick; as manufactuered by The Weston Company. www.westoncompany.com.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150, Type I; color as required to produce approved color sample.
- B. Packaged blend of portland cement complying with ASTM C 150, Type II/I or Type III, and hydrated lime.
 - 1. Not more than 0.60 percent alkali.
 - 2. Hydrated Lime: ASTM C207, Type S.
 - 3. Mortar Aggregate: ASTM C144.
 - 4. Grout Aggregate: ASTM C404.
- C. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979.

- 1. Manufacturers:
 - a. Davis Colors: www.daviscolors.com.
 - b. Lambert Corporation: www.lambertusa.com.
 - c. Solomon Colors: www.solomoncolors.com.
 - d. ESSROC Cement Corp.; Flamingo.
 - e. Lehigh Cement Company.
- D. Admixtures: Permitted for cold- and hot-weather masonry work as permitted by referenced standards; non-chloride types.
- E. Water: Clean and potable.
- F. Integral Liquid Polymeric Water-repellent Mortar Admixture:
 - 1. Include liquid polymeric admixture to the mortar for exterior decorative block walls at the time of mixing.
 - 2. Warranty: Integral liquid polymeric water-repellent mortar admixture shall be warranted by admixture manufacturer to be free of defects and to meet manufacturer's published physical and chemical properties.
 - 3. Installer shall warrant that only mortar containing integral liquid polymeric water-repellent mortar admixture has been used to set decorative block in exterior walls.
 - 4. Description:
 - a. Integral liquid polymeric admixture, added to mortar during mixing, capable of attaining Class E Rating under ASTM E514.
 - b. When tested in walls containing CMUs with compatible integral liquid polymeric water-repellent CMU admixture, walls shall exhibit no decrease in flexural strength or compressive strength of prisms when compared to "control", under ASTM E72.
 - c. Project Standard: Dry-Block Integral Liquid Polymeric Water-repellent Mortar Admixture as manufactured by Grace Construction Products.

2.5 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
 - 1. AA Wire Products Co.
 - 2. Dur-O-Wal: www.dur-o-wal.com.
 - 3. Heckman Building Products, Inc.
 - 4. Hohmann & Barnard, Inc (including Dur-O-Wal brand): www.h-b.com.
 - 5. WIRE-BOND: www.wirebond.com.
 - 6. National Wire Products Industries.
- B. Reinforcing Steel: ASTM A615/A615M Grade 60 (420) deformed billet bars; uncoated.
 - 1. Recycled Content: Provide steel with minimum 90 percent total recycled content, including at least 60 percent post-consumer recycled content.
 - 2. Regional Materials: Provide at least 75 percent of steel manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.
- C. Joint Reinforcement General:
 - 1. Provide in lengths of not less than 10 feet.
 - 2. Provide with prefabricated corner and tee units of same design type, wire thickness and finish as adjoining joint reinforcement.
- D. Single Wythe Joint Reinforcement: Ladder type; ASTM A 82/A 82M steel wire, mill galvanized to ASTM A 641/A 641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

- E. Adjustable Multiple Wythe Joint Reinforcement: Ladder type with adjustable eye and pintle ties spaced at 16 in on center and fabricated with moisture drip; ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B; 0.1875 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire; width of components as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from each masonry face.
 - 1. Vertical adjustment: Not less than 2 inches.
 - 2. Fabricate such that the eye will be three inches away from face of masonry.
- F. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
 - 1. Steel frame: Crimped wire anchors for welding to frame, 0.25 inch thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
- G. Masonry Veneer Anchors: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:
 - 1. Anchor plates: Designed for fastening to structural backup through sheathing by two fasteners.
 - a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
 - b. Fabricate sheet metal anchor sections and other sheet metal parts from minimum 14 gage, steel sheet, galvanized after fabrication.
 - 2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
 - 3. Vertical adjustment: Not less than 3-1/2 inches.
 - 4. Products:

5.

- a. Hohmann & Barnard, Inc.; BL-407 Anchor.
- b. Construction Tie Products; CTP Veneer Anchoring System.
- Organic-Polymer-Coated, Steel Drill Screws:
- a. Dril-Flex; Elco Industries, Inc.
- b. Traxx; ITW-Buildex.
- H. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by ¹/₄ inch thick by 24 inches long, with ends turned up 2 inches unless otherwise indicated.
 - 1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.
- I. Reinforcing Bar Couplers:
 - 1. Mechanical splice connectors capable oof developing intension or compression at least 125 percent of the specified yield strength of the bar.
 - 2. Representative Product: BarSplice Products, Inc., Tapered Threaded Grip-Twist Series.
- J. Reinforcing Bar Positioners:
 - 1. Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells, or as indicated on Drawings. Units are formed from 0.142-inch steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated. Provide units at all reinforced walls.
 - 2. Products:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
 - b. Heckmann Building Products Inc.; No. 376 Rebar Positioner.

- c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
- d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

2.6 FLASHINGS

- A. Flexible Flashing CMU Backup: See Section 07 21 27 Enclosed Cavity Foamed Insulation.
- B. Stainless Steel Drip Plates:
 - 1. Provide at flexible flashing locations, as indicated.
 - 2. Material: Minimum 26 gage stainless steel.
 - 3. Profile:
 - a. Provide with closed hemmed drip edge to extend past face of wall.
 - b. Provide vertical leg extending up backup wall minimum 2 inches.
 - c. Provide pitch in drip plate as indicated on Drawings.
 - d. Provide shop fabricated inside and outside corner.
 - e. At lip brick profiles, match profile with step in drip plate.
 - 4. Flexible flashing will cover drip plate; cut flush with face of mortar joint.
 - 5. Provide 1/8 inch thick sealant tape between drip plate and steel structural member.
 - 6. Bond flexible flashing to drip plate as recommended by flexible flashing manufacturer; product selection to ensure against adhesive drool beyond face of brick.
 - 7. Backer rod and sealant to be provided under drip edge per Division 7, at locations protecting steel.
- C. Drip Plate Fasteners CMU Backup: Use low-velocity powder actuated ballistic point fastener with pre-mounted washer; submit ICC-ES Evaluation Report under product data submittals indicating fastener selection appropriate for intended use.
- D. Self-adhering Flashing Seam Tape:
 - 1. Sheet Material: 40 mil membrane with DuPont Elvaloy Kee; pressure sensitive clear adhesive for full bond to stainless steel drip plate and backup construction.
 - 2. Conforms to ASTM D412, ASTM D2240, ASTM D624 Die C, and ASTM G154.
 - 3. Basis-of-Design Product: Flex-Flash 8-inch wide roll by Hohmann & Barnard, Inc.
- 2.7 ACCESSORIES
 - A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
 - B. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to full depth of air space, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Mortar Diverter: Panels designed for installation at flashing locations.
 - a. Manufacturers:
 - 1) Mortar Net USA, Ltd; Product Mortar Net: www.mortarnet.com.
 - 2) Keene Building Products; Product Keenestone Cut.
 - 3) Hohmann and Barnard, Inc.; Product Mortar Trap.
 - C. Cavity Vents: Polyester mesh or cellular insect-resistant vents.
 - 1. Locations: Flashing location at base of cavity wall construction.
 - 2. Manufacturers:
 - a. CavClear/Archovations, Inc: www.cavclear.com.
 - b. Dur-O-Wal; Product D1006 Cell Vents: www.dur-o-wal.com.
 - c. Hohmann & Barnard, Inc; Product Quadro-Vent: www.h-b.com.
 - d. Mortar Net USA, Ltd; Mortar Net Weep Vents: www.mortarnet.com.

D. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials, as recommended by brick manufacturer.

2.8 LINTELS

- A. Concrete Lintels: Precast units made from concrete matching concrete masonry units in color, texture, and compressive strength and with reinforcing bars required to support loads indicated. Cure precast lintels by same method used for concrete masonry units.
- B. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam concrete masonry units with reinforcing bars placed as required and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.9 MORTAR AND GROUT MIXES

- A. Mortar for Unit Masonry: ASTM C270, using the Property Specification.
 - 1. Masonry below grade and in contact with earth: Type M.
 - 2. Exterior, loadbearing masonry: Type S.
 - 3. Exterior, brick veneer: Type N.
 - 4. Interior, loadbearing masonry: Type N, except reinforced masonry to be Type S.
 - 5. Interior, non-loadbearing masonry: Type O or Type N (Contractor's discretion).
- B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
- C. Grout: ASTM C476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

PART 3 EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

3.3 COLD AND HOT WEATHER REQUIREMENTS

- A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.
- 3.4 INSTALLATION GENERAL
 - A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
 - B. Build chases and recesses to accommodate items specified in this and other Sections.

- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- D. Do not install cracked, broken or chipped masonry units for any location to be exposed in completed work; do not install cracked, broken or chipped masonry units exceeding ASTM allowances in work to remain concealed or within mechanical or electrical spaces.
- E. 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.
- F. 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.
- G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.
- H. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
 - 1. Install compressible filler in joint between top of partition and underside of structure above.
 - 2. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 07 84 46.

3.5 COURSING

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

3.6 PLACING AND BONDING

- A. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- B. Remove excess mortar and mortar smears as work progresses.
- C. Interlock intersections and external corners.

- D. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- E. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- F. Cut mortar joints flush where wall tile is scheduled, resilient base is scheduled, cavity insulation vapor barrier adhesive is applied, or bitumen dampproofing is applied.
- G. Pointing:
 - 1. During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar.
 - 2. Point joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance.
 - 3. Prepare joints for sealant application, where indicated.
- H. Isolate masonry partitions from vertical structural framing members with a control joint and flexible anchors.
- I. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.
- 3.7 CAVITY VENTS
 - A. Place cavity vents such as two consecutive vertical joints will include vent followed by a vertical joint without; repeat this placement for full length of application.
 - B. Install vents in contact with flashing, full-width of head joint and uninterrupted by mortar.
- 3.8 CAVITY MORTAR CONTROL
 - A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
 - B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
 - C. Install cavity mortar diverter at base of cavity and at other flashing locations indicated on Drawings and as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.
- 3.9 REINFORCEMENT AND ANCHORAGE GENERAL
 - A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere.
 - 1. Space reinforcement not more than 16 inches o.c.
 - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.
 - a. Reinforcement of this subparagraph 3 is in addition to continuous reinforcement.
 - B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 - C. Place continuous joint reinforcement in first and second joint below top of walls.
 - D. Lap joint reinforcement ends minimum 6 inches.
 - E. Interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
 - F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

- 1. Provide an open space not less than 1/2 inch in width between masonry and structural member, unless otherwise indicated.
- 2. Keep open space free of mortar and other rigid materials.

3.10 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Typical: Place masonry joint reinforcement in first and second horizontal joints above and below openings.
 - 1. Extend minimum 16 inches each side of opening.
 - 2. Modify placement where flashing occurs in joint; flashing takes precedent; joint reinforcement location adjusted as accepted by Architect.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- F. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- G. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.

3.11 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width of openings and at least 4 inches into adjacent masonry at each end; turn up not less than 2 inches to form end dams.
 - 2. Carry flashing across air space behind veneer and up face of backup construction at least 8 inches to form watertight pan; extend flashing into masonry backup minimum 1-3/4 inches; secure flashing at non-masonry construction with termination bar and seal.
 - 3. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 4. Embed flashings in mortar joint; place flashing on sloping bed of fresh mortar and cover with fresh mortar
 - 5. Seal lapped seams of stainless steel drip plates with self-adhering flashing seam tape; stop self-adhering flashing seam tape 3/8 inch of brick face and extend over turned up edge 3 inches onto backup construction; center tape on overlapping edge.
 - 6. Seal lapped ends and penetrations of flashing with adhesive or sealant, as recommended by flashing manufacturer, before covering with mortar.
- B. Lap end joints of flashings at least 6 inches and seal watertight as recommended by flashing manufacturer.
- C. Cut flashing flush with face of mortar joint after masonry construction is complete and inspected.

3.12 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.13 GROUTED COMPONENTS

- A. Lap splices minimum 48 bar diameters.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- C. Place and consolidate grout fill without displacing reinforcing.
- D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.14 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. 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 cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 48 inches.

3.15 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control and expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.16 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
 - 1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
- E. Do not build into masonry construction organic materials that are subject to deterioration.
- F. Outdoor Slate Chalkboard: Custom fit split tail fasteners into edge of slate panels and mount to backup material such that faces of slate are aligned, flush, and as tight as possible.

3.17 TOLERANCES

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

3.18 CUTTING AND FITTING

A. Cut and fit for chases, pipes, and conduit. Coordinate with other sections of work to provide correct size, shape, and location.

3.19 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67 requirements, sampling 5 randomly chosen units for each 50,000 installed.
- C. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140 for conformance to requirements of this specification.
- D. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.
 - 1. Test three samples for each 5,000 square feet of wall or portion thereof; test one sample at 7 days and two at 28 days for each set.
- E. Test weep holes by pouring a bucket of water in cavity space at appropriate intervals of brick laying; clear weep holes that do not weep water from cavity space, including removal of wall as necessary to provide a proper functioning cavity drainage. Test frequency as necessary to confirm working condition of minimum 75 percent of weep vents. Testing to be witness by a third-party inspector/agency.

3.20 REPAIRING WORK

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.

3.21 CLEANING

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

3.22 PROTECTION

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

END OF SECTION

SECTION 04 72 00 - CAST STONE MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Architectural cast stone.
- B. Units required are:
 - 1. Site Sign components.

1.2 RELATED REQUIREMENTS

- A. Section 04 20 00 Unit Masonry: Installation of cast stone in conjunction with masonry.
- B. Section 07 90 05 Joint Sealers: Materials and execution methods for sealing soft joints in cast stone work.

1.3 DESIGN REQUIREMENTS

- A. Wind Loads:
 - 1. Design anchors to withstand positive and negative wind loads acting normal to plane of wall, including increased loads at building corners.
 - 2. Design Wind Load: To design pressure of 25 psf.
- B. Design anchor attachment to cast stone with factor of safety of 5:1.
- C. Design each individual anchor with factor of safety in vertical dead-load-bearing direction of 4:1 and in horizontal lateral-load-bearing direction of 2:1.
- D. Fabrication to be per methods allowed under ASTM C 1364; wet or dry cast.

1.4 REFERENCE STANDARDS

- A. ACI 318 Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2008.
- B. ASTM A185/A185M Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.
- C. ASTM A615/A615M Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.
- D. ASTM C33/C33M Standard Specification for Concrete Aggregates; 2011a.
- E. ASTM C150/C150M Standard Specification for Portland Cement; 2012.
- F. ASTM C270 Standard Specification for Mortar for Unit Masonry; 2012.
- G. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete; 2011.
- H. ASTM C642 Standard Test Method for Density, Absorption, and Voids in Hardened Concrete; 2006.
- ASTM C979/C979M Standard Specification for Pigments for Integrally Colored Concrete; 2010.
- J. ASTM C1364 Standard Specification for Architectural Cast Stone; 2010b.
- 1.5 SUBMITTALS
 - A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
 - B. Product Data: Test results of cast stone components made previously by the manufacturer.
 1. Include one copy of ASTM C1364 for Architect's use.

- C. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Division 01 LEED sections and appropriate forms, and Section 013 00
- D. Shop Drawings: Include elevations, dimensions, layouts, profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, and piece numbers.
- E. Mortar Color Selection Samples.
- F. Verification Samples: Pieces of actual cast stone components not less than 12 inches square, illustrating range of color and texture to be anticipated in components furnished for the project.
- G. Source Quality Control Test Reports.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. A firm with a minimum of 5 years experience producing cast stone of types required for project.
 - 2. Adequate plant capacity to furnish quality, sizes, and quantity of cast stone required without delaying progress of the work.
 - 3. Design anchors, cast units under direct supervision of Professional Engineer experienced in design of this Work and licensed in jurisdiction.
- B. Mock-Up: Provide full size cast stone components for installation in mock-up of exterior wall.
 - 1. Remove mock-up not incorporated into the work and dispose of debris.
- C. Source Quality Control: Test compressive strength and absorption of specimens selected at random from plant production.
 - 1. Test in accordance with ASTM C642.
 - 2. Select specimens at rate of 3 per 500 cubic feet, with a minimum of 3 per production week.
 - 3. Submit reports of tests by independent testing agency, showing compliance with requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration. Protect corners from damage.
- B. Number each piece individually to match shop drawings and schedule.
- C. Store cast stone components and installation materials in accordance with manufacturer's instructions.
- D. Store cast stone components on pallets with nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Prevent contact with dirt.
- E. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.
- F. Store mortar materials where contamination can be avoided.
- G. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Architectural Cast Stone:
 - 1. Continental Cast Stone Manufacturing Company.
 - 2. Reading Rock.
 - 3. Arban Precast Stone, Ltd..

2.2 ARCHITECTURAL CAST STONE

- A. Cast Stone: Architectural concrete product manufactured to simulate appearance of natural limestone, complying with ASTM C1364.
 - 1. Compressive Strength: As specified in ASTM C1364; calculate strength of pieces to be field cut at 80 percent of uncut piece.
 - 2. Freeze-Thaw Resistance: Demonstrated by field experience.
 - 3. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 5 feet.
 - 4. Color: Selected by Architect from manufacturer's full range.
 - 5. Remove cement film from exposed surfaces before packaging for shipment.
- B. Shapes: Provide shapes indicated on drawings.
 - 1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch or length divided by 360, whichever is greater, but not more than 1/4 inch.
 - 2. Unless otherwise indicated on drawings, provide:
 - a. Wash or slope of 1:12 on exterior horizontal surfaces.
 - b. Drips on projecting components, wherever possible.
 - c. Raised fillets at back of sills and at ends to be built in.
- C. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI 318.
 - 1. Reinforcement shall be noncorrosive where faces exposed to weather are covered with less than 1.5 in. of concrete material.
 - 2. All reinforcement shall have minimum coverage of twice the diameter of the bars.
 - 3. Panels, soffits and similar stones greater than 24 in. in one direction shall be reinforced in that direction.
 - 4. Units less than 24 in. in both their length and width dimension shall be non-reinforced unless otherwise specified.
 - 5. Minimum amount of reinforcing shall be 0.25 percent of the cross section area.

2.3 MATERIALS

- A. Portland Cement: ASTM C150.
 - 1. For Units: Type I or II, white.
 - 2. For Mortar: Type I or II, except Type III may be used in cold weather.
- B. Coarse Aggregate: ASTM C33, except for gradation; granite, quartz, or limestone.
- C. Fine Aggregate: ASTM C33, except for gradation; natural or manufactured sands.
- D. Pigments: ASTM C979, inorganic iron oxides; do not use carbon black.
 - 1. Provide colored mortar for exposed cast stone work; color to be selected by Architect.
- E. Admixtures: ASTM C494/C494M.

- F. Integral Water-repellant: Standard product accepted by cast stone fabricator within the mix design; product for mix design and setting mortar to be from same source.
 1. Provide for all units and mortar.
- G. Water: Potable.
- H. Reinforcing Bars: ASTM A615/A615M deformed bars, galvanized or epoxy coated.
- I. Steel Welded Wire Reinforcement: ASTM A185/A185M, galvanized or epoxy coated.
- J. Embedded Anchors, Dowels, and Inserts: Type 304 stainless steel, of type and size as required for conditions.
- K. Mortar: Portland cement-lime, ASTM C 270, Type N; do not use masonry cement.
- L. Sealant: As specified in Section 07 90 05.
- M. Cleaner: General-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces; approved for intended use by cast stone manufacturer and by cleaner manufacturer for use on cast stone and adjacent masonry materials.

2.4 FABRICATION

- A. General Requirements: Fabricate units straight and true to component shapes detailed, and with accurate dimension control.
 - 1. Provide holes, sleeves, and slots to receive anchors and dowels and to provide drips.
 - 2. Provide reinforcement as shown on the approved shop drawings.
 - 3. Provide anchors, inserts, dowels, etc. in accordance with approved shop drawings and as required for proper installation of cast stone units.
- B. Joints in sills and headers on multiple windows to occur at center of mullions or columns, or constructed with two equal length pieces with joint occurring in centerline of window elevation.
- C. Compressive Strength: 7,000 psi at 28 days.
- D. Air Entrainment: Not less than 4-1/2 percent nor more than 6 percent.
- E. Curing Dry Cast Method: Steam cure dry cast units in a warm curing chamber approximately 100°F at 100 percent relative humidity for approximately 12 hours, or form cure wet cast units in a 95 percent moist environment at a minimum 70°F for 16 hours after casting. Additional yard curing at 95 percent relative humidity shall be 350 degree-days (i.e. 7 days @ 50°F or 5 days @ 70°F) prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.
- F. Curing Wet Cast Method: Cure in form overnight within a climate controlled environment.

2.5 SOURCE QUALITY CONTROL

- A. Test and analyze three random specimens for each 500 cubic feet, or portion thereof, of fabricated cast stone units:
 - 1. Compressive Strength: In accordance with ASTM C1194.Cold Water Absorption: In accordance with ASTM C1195.
 - 2. Resistance to Freezing and Thawing: In accordance with ASTM C666; maximum cumulative percent mass loss in accordance with ASTM C1364.
 - 3. Visually inspect color differences between fabricated units and approved sample in accordance with ASTM D1729.

4. Absorption: ASTM C1195; maximum 6 percent for cold water and 10 percent for boiling water at 28 days.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Examine construction to receive cast stone components. Notify Architect if construction is not acceptable.
 - B. Do not begin installation until unacceptable conditions have been corrected.
- 3.2 INSTALLATION
 - A. Install cast stone components in conjunction with masonry, complying with requirements of Section 04 20 00.
 - B. Mechanically anchor cast stone units indicated; set remainder in mortar.
 - C. Setting:
 - 1. Drench cast stone components with clear, running water immediately before installation.
 - 2. Set units in a full bed of mortar unless otherwise indicated.
 - 3. Fill vertical joints with mortar.
 - 4. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
 - 5. Do not shift or tap cast stone units after mortar has achieved initial set; where adjustment is required, remove mortar and replace.
 - 6. Keep exposed faces free of mortar; immediately remove mortar that comes in contact with faces using brush and clean water.
 - D. Joints: Make all joints 3/8 inch, except as otherwise detailed.
 - 1. Rake mortar joints 3/4 inch for pointing.
 - 2. Remove excess mortar from face of stone before pointing joints.
 - 3. Point joints with mortar in layers 3/8 inch thick and tool to a slight concave profile.
 - 4. Leave the following joints open for sealant:
 - a. Head joints in top coarses, including copings, cornices and sills.
 - b. Joints in projecting units.
 - c. Joints below lugged sills.
 - d. Joints below ledge and relieving angles.
 - e. Joints labeled "expansion joint".
 - 5. Cut out defective mortar joints and repoint.
 - E. Sealant Joints: Install sealants as specified in Section 07 90 05.
 - F. Installation Tolerances:
 - 1. Variation from Plumb: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet or more.
 - 2. Variation from Level: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet, or 3/8 inch maximum.
 - 3. Variation in Joint Width: Not more than 1/8 inch in 36 inches or 1/4 of nominal joint width, whichever is less.
 - 4. Variation in Plane Between Adjacent Surfaces (Lipping): Not more than 1/16 inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.
 - G. Repairs: Repair chips and other surface damage noticeable when viewed in direct daylight at 5 feet.

- 1. Repair with matching touchup material provided by the manufacturer and in accordance with manufacturer's instructions.
- 2. Repair methods and results subject to Architect 's approval.

3.3 CLEANING

- A. Repair chips and other surface damage noticeable when viewed in direct daylight at 5 feet.
 - 1. Repair with matching touchup material provided by the manufacturer and in accordance with manufacturer's instructions.
 - 2. Repair methods and results subject to Architect 's approval.
- B. Keep cast stone components clean as work progresses.

3.4 PROTECTION

- A. Protect completed work from damage.
- B. Clean, repair, or restore damaged or mortar-splashed work to condition of new work.
- C. Protect from splashing by mortar and other damage.

END OF SECTION

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel framing members, support members and struts.
- B. Base plates, shear stud connectors and expansion joint plates.
- C. Grouting under base plates.

1.2 REFERENCE STANDARDS

- A. AISC (MAN) Steel Construction Manual; American Institute of Steel Construction, Inc.; 2011.
- B. AISC S303 Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2010.
- C. AISC S348 Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.
- D. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
- E. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- F. ASTM A108 Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2013.
- G. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- H. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- I. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2012.
- J. ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- K. ASTM A490 Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength; 2012.
- N. ASTM A500/A500M Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- O. ASTM A501/A501M Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- P. ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts; 2007a (Reapproved 2014).
- R. ASTM A992/A992M Standard Specification for Structural Steel Shapes; 2011.
- S. ASTM C1107/C1107M Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.
- T. ASTM E94 Standard Guide for Radiographic Examination; 2004 (Reapproved 2010).
- U. ASTM E164 Standard Practice for Contact Ultrasonic Testing of Weldments; 2013.
- V. ASTM E165/E165M Standard Test Method for Liquid Penetrant Examination for General Industry; 2012.
- W. ASTM E709 Standard Guide for Magnetic Particle Testing; 2014.
- X. ASTM F436 Standard Specification for Hardened Steel Washers; 2011.

- Y. ASTM F959 Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners; 2013.
- Z. ASTM F1554 Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2007a.
- AA. AWS A2.4 Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
- AB. AWS D1.1/D1.1M Structural Welding Code Steel; American Welding Society; 2010 w/Errata.
- AC. RCSC (HSBOLT) Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.
- AD. IBC 2015 International Building Code.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, splices, attachments, and fasteners.
 - 2. Detail all connections.
 - a. Indicate pre-tensioned and slip-critical high-strength bolted connections.
 - b. Indicate welded connections with AWS welding symbols. Include type, size and length.
 - c. Indicate all AWS weld designations for pre-qualified full and partial penetration welds and detail all joint preparations..
 - 3. Indicate cambers and loads.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
 - 5. For structural-steel connections indicated to comply with design loads, connections and structural analysis data shall be signed and sealed by the qualified Professional Engineer registered in the State in which the Project is located responsible for their preparation.
- C. AISC certification for fabricator and erector.
- D. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- E. Mill Test Reports: Signed by manufacturer certifying that the product complies with specified requirements. Indicate structural strength, destructive test analysis and non-destructive test analysis.
- F. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of recycled content type and percentage, location of extraction/recovery of primary raw materials, steel mill process, location of mill, location of fabrication and costs.
- G. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- H. Quality control test reports for shop and field including ultrasonic test results.
 - 1. Submit certification by a Professional Engineer registered in the State of Maryland that all joint preparation for complete joint penetration welds meet AISC requirements and that all welding procedure specification requirements have been met.

1.4 QUALITY ASSURANCE

- A. Domestic Origin: Consistent with the Maryland Annotated Code, Article 78A known as the "Buy American Steel" Act of the General Assembly of Maryland, Acts of 1978, provide steel manufactured in the United States of America.
- B. Fabricate structural steel members in accordance with AISC "Steel Construction Manual." and AISC "Code of Standard Practice for Steel Buildings and Bridges".
- C. Comply with Section 10 of AISC "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.
- D. Maintain one copy of each document on site.
- E. Fabricator: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and within 15 percent this project size, with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work.
 - 1. Fabricator must be designated as an AISC-certified plant, Category STD.
 - 2. Allow the owner's representative to visit the fabrication plant as required to inspect in place quality control procedures and structural steel fabrication.
 - 3. Contractor Option: Comply with the following procedures instead of engaging an AISC-Certified Plant:
 - a. Demonstrate that the fabricator has in place a quality control program for meeting IBC requirements and compliance with AISC recommendations and standards.
 - b. At no additional cost to the Owner, provide an independent shop inspection for compliance with IBC, AISC and AWS recommendations and standards. The independent inspection agency shall be different than the testing agency engaged by the Owner.
 - c. Shop inspection tasks required by AISC 360 to be performed by the fabricator's quality control personnel, shall be overseen by the independent inspector hired by the fabricator.
 - d. At completion of fabrication, and prior to erecting steel, submit a certificate of compliance signed and sealed by the third party inspector, stating that the steel fabrication complies with the requirements of the construction documents.
 - e. Shop drawings shall be signed and sealed by a professional engineer, registered in the local jurisdiction, responsible for the design of the connections. The professional engineer shall carry a minimum of \$1,000,000.00 of professional liability insurance.
 - f. The steel fabricator shall provide field repair details, along with computations, for all required field modifications. The details and calculations shall be signed and sealed by the same professional engineer that certified the shop drawings.
 - 4. Provide documentation that fabricator has provided material for and erected at least 3 projects within 15 percent of project size and complexity, in the last 6 years.
- F. Erector: Engage a firm experienced in erecting structural steel similar to that indicated for the project and within 15 percent of this project size, with a record of successful in-service performance.
 - 2. Erector must be designated an AISC Certified Steel Erector (CSE).
 - 3. Provide documentation that the erector has erected at least 3 projects within 15 percent of project size and complexity in the last six years.

F. Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off the ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
 - 1. Store fasteners in a protected place. Clean and re-lubricate bolts and nuts that become dry or rusty before use.
 - 2. Do not store materials on structure in a manner that might cause deterioration, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.5 COORDINATION

A. Furnish 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.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Recycled Content: Provide W-shape, channel and angle shapes steel with minimum 90 percent total recycled content including at least 60 percent post-consumer recycled content, except as follows:
 - 1. Plate and Bar: Minimum 30 percent total recycled content.
 - 2. Cold-Formed Hollow Structural Sections: Minimum 30 percent total recycled content.
 - 3. Steel Pipe: Minimum 30 percent total recycled content.
 - 4. All Other Steel Materials: Minimum 30 percent total recycled content.
- B. Regional Materials: Provide at least 75 percent of steel manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.
- C. Steel Angles and Plates: ASTM A36/A36M.
- D. Steel W Shapes and Tees: ASTM A992/A992M.
- E. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.
- F. Pipe: ASTM A53/A53M, Grade B, Finish black.
- G. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.
- H. Sag Rods: ASTM A 36/A 36M.
- I. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A galvanized to ASTM A 153/A 153M, Class C.
- J. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or A325M, Type 1, medium carbon, galvanized, with matching compatible ASTM A563 or A563M nuts and ASTM F436 washers.
- K. High-Strength Structural Bolts: ASTM A490 or A490M; Type 1 alloy steel, with matching compatible ASTM A563 or A563M nuts and ASTM F436 washers.
- L. Unheaded Anchor Rods: ASTM F1554, Grade 36, plain, with matching ASTM A563 or A563M nuts and ASTM F436 Type 1 washers.

- M. Headed Anchor Rods: ASTM A 307, Grade C.
- N. Load Indicator Washers: Provide washers complying with ASTM F959 at all connections requiring high-strength bolts.
- O. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- P. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C1107/C1107M and capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- Q. Shop and Touch-Up Primer: Type specified in Division 9 painting sections, complying with VOC limitations of authorities having jurisdiction.
- R. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Develop required camber for members.
- C. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.1. Plane thermally cut edges to be welded to comply with requirements of AWS D1.1.
- D. Bolt Holes: Drill or punch standard bolt holes perpendicular to metal surfaces.
- E. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

2.3 FINISH

- A. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
- B. Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.
 - 1. Galvanize shelf angles, lintels and hung plates located in exterior walls.
 - 2. Galvanize all exterior steel.
- C. Surface preparation: SSPC-SP2: "Hand Tool Cleaning", or SSPC-SP3, "Power Tool Cleaning".
- D. Provide a dry film thickness of not less than 1.5 mil.
- E. Refer to Division 9 painting sections for primer specifications.

2.4 SOURCE QUALITY CONTROL

- A. An independent testing agency will perform source quality control tests, as specified in Section 01 40 00. Inspection services shall conform to Section 1705.2 of the 2015 IBC Code, the quality assurance inspection requirements of AISC 360 and the Statement of Special inspections noted in the structural drawings.
- B. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts", testing at least 10 percent of bolts at each connection.
 - 1. Pre-tensioned and slip-critical bolts shall be installed using direct-tension-indicator washer method or twist-off type tension control bolt method.
- C. Welded Connections: Visually inspect all shop-welded connections and test all full penetration welds using ultrasonic testing performed in accordance with ASTM E 164.

1. Inspect all joint preparations for complete joint penetration welds and verify compliance with welding procedure specification requirements.

PART 3 EXECUTION

3.1 ERECTION

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts".
- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.
- 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 and manufacturer's written instructions.
- 3.2 TOLERANCES
 - A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
 - B. Maximum Offset From True Alignment: 1/4 inch.

3.3 FIELD QUALITY CONTROL

- A. A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00. Inspection services shall conform to Section 1705.2 of the 2015 IBC Code, the quality assurance inspection requirements of AISC 360 and the Statement of Special Inspections noted in the structural drawings.
- B. High-Strength Bolts: Provide testing and verification of all field-bolted connections in accordance with AISC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts".
 - 1. Pre-tensioned and slip-critical bolts shall be installed using direct-tension-indicator washer method or twist-off type tension control bolt method.
- C. Welded Connections: Visually inspect all field-welded connections and test all full penetration welds using ultrasonic testing performed in accordance with ASTM E 164.
 - 1. Inspect all joint preparations for complete joint penetration welds and verify compliance with welding procedure specification requirements.

- D. In addition to visual inspection, field-welded shear connectors shall be tested and inspected according to the requirements of AWS D1.1 for stud welding.
- E. Correct deficiencies in work that inspections indicate does not comply with the specified requirements.

END OF SECTION

SECTION 05 21 00 - STEEL JOIST FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Open web steel joists, with bridging, attached seats and anchors.
- B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
- C. Supplementary framing for floor and roof openings greater than 18 inches.
- D. Joist accessories.

1.2 REFERENCE STANDARDS

- A. AISC S348 Specification for Structural Joints Using ASTM A 325 or A 490 bolts
- B. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
- C. ASTM A 325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- D. ASTM E94 Standard Guide for Radiographic Examination; 2004 (Reapproved 2010).
- E. ASTM E164 Standard Practice for Contact Ultrasonic Testing of Weldments; 2013.
- F. ASTM E165/E165M Standard Test Method for Liquid Penetrant Examination for General Industry; 2012.
- G. ASTM E709 Standard Guide for Magnetic Particle Testing; 2014.
- H. AWS B2.1/B2.1M Specification for Welding Procedure and Performance Qualification; 2014.
- I. AWS D1.1/D1.1M Structural Welding Code Steel; American Welding Society; 2010 w/Errata.
- J. RCSC (HSBOLT) Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.
- K. SJI (SPEC) Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders; Steel Joist Institute; 2011.
- L. SJI Technical Digest No. 9 Handling and Erection of Steel Joists and Joist Girders; Steel Joist Institute; 2008.
- M. SSPC-SP 2 Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).
- N. IBC 2015 International Building Code.

1.3 SPECIAL JOISTS

A. Design special joists to withstand design loads indicated with live load deflection no greater than L/360 of the span.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Show layout, designation, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, joist accessories; splice and connection locations and details; and attachments to other construction.
 - 1. Indicate locations and details of bearing plates to be embedded in other construction.

- 2. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer licensed in the State in which the Project is located who is responsible for its preparation.
- C. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of recycled content type and percentage, location of extraction/recovery of primary raw materials, steel mill process, location of mill, location of fabrication and costs.
- D. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.
- E. Manufacturer's Certificates: Signed by manufacturers certifying that joists comply with requirements.
- F. Manufacturer's Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with requirements.

1.5 QUALITY ASSURANCE

- A. Domestic Origin: Consistent with the Maryland Annotated Code, Article 78A known as the "Buy American Steel" Act of the General Assembly of Maryland, Acts of 1978, provide steel manufactured in the United States of America.
- B. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable specifications and load tables of SJI "Specifications".
 - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- C. SJI Specifications: Comply with standard specification in SJI's "Specifications" that are applicable to types of joists indicated.
- D. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M "Structural Welding Code Steel".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Regional Materials: Provide at least 75 percent of steel manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.
- B. Steel Joists:
- C. Canam Group Inc: www.canam-steeljoists.ws
- D. CMC Joist: www.cmcjoist.com.
- E. Nucor-Vulcraft Group: www.vulcraft.com.

2.2 MATERIALS

- A. Recycled Content: Provide steel with at least 75 percent recycled content.
- B. Open Web Joists: SJI Type K Joists:

- 1. Provide bottom and top chord extensions as indicated.
- 2. End bearing of 2-1/2 inches on steel supports.
- 3. End bearing of 4 inches on masonry supports.
- 4. Finish: Shop primed.
- C. Open Web Joists: SJI Type LH Joists:
 - 1. Provide bottom and top chord extensions as indicated.
 - 2. End bearing of 4 inches on steel supports.
 - 3. End bearing of 6 inches on masonry supports.
 - 4. Finish: Shop primed.
- D. High-Strength Bolts, Nuts and Washers: ASTM A 325, Type 1, heavy hex steel bolts with ASTM A563 heavy hex nuts and ASTM F436 washers; plain.
- E. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36/A 36M.
- F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- G. Shop and Touch-Up Primer: Type specified in Section 09 91 23, complying with VOC limitations of authorities having jurisdiction.
- H. Steel: Comply with SJI's Specifications for web and angle chord members.
- 2.3 FABRICATION
 - A. Manufacture steel joists to meet SJI's "Specifications", with steel angle top and bottom-chord members; of joist type and end and top-chord arrangements as indicated.
 - B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
 - C. Provide holes in chord members for connecting and securing other construction to joists.
 - D. Camber steel joists according to SJI's "Specifications".
 - E. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds ¹/₄ inch per twelve inches.
 - F. Bridging: Provide bridging anchors and number of rows of horizontal and diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Provide additional erection bridging if required for stability and where indicated on the Drawings.
 - G. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Shop prime paint.
 - H. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within ½ inch of finished wall surface unless otherwise indicated.
 - I. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.4 FINISH

- A. Prepare surfaces to be finished in accordance with SSPC-SP 2.
- B. Apply shop primer to joists and joist accessories to provide a continuous dry paint film not less than 2 mil thick; apply two coats of shop primer if necessary to meet specified dry film thickness.

PART 3 EXECUTION

3.1 ERECTION

- A. Erect joists with correct bearing on supports.
- B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
- C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
- D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
- E. Coordinate placement of anchors in concrete and masonry construction for securing bearing plates.
- F. After joist alignment and installation of framing, field weld joist seats to bearing plates.
- G. Position and field weld joist chord extensions and wall attachments as detailed.
- H. Install supplementary framing for roof openings greater than 18 inches.
- I. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
- J. Do not field cut or alter structural members without approval of joist manufacturer.
- K. After erection, prime welds and damaged shop primer, except surfaces specified not to be primed.

3.2 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.3 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements. Inspection services shall conform to Section 1705.2 of the 2015 IBC Code and the Statement of Special Inspections noted in the structural drawings.
- B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts", testing at least 10 percent of bolts at each connection.
- C. Welded Connections: Visually inspect all field-welded connections and test 100 percent of full-penetration welds using ultrasonic testing performed in accordance with ASTM E 164.
- D. Correct deficiencies in work that inspections indicate are not in compliance with specified requirements

END OF SECTION

SECTION 05 31 00 - STEEL DECKING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Acoustical roof deck.
- B. Roof deck.
- C. Composite floor deck.
- D. Supplementary framing for openings up to and including 12 inches.
- F. Bearing plates and angles.
- G. Stud shear connectors.

1.2 REFERENCE STANDARDS

- A. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A108 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2013.
- C. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- D. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- E. ASTM A1008/A1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2013.
- F. AWS D1.1/D1.1M Structural Welding Code Steel; American Welding Society; 2010 w/Errata.
- G. AWS D1.3/D1.3M Structural Welding Code Sheet Steel; American Welding Society; 2008.
- H. SDI (DM) Publication No.31, Design Manual for Composite Decks, Form Decks, Roof Decks; Steel Deck Institute; 2007.
- I. SSPC-Paint 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); The Society for Protective Coatings; 2002 (Ed. 2004).

1.3 PERFORMANCE REQUIREMENTS

- A. Select and design metal deck in accordance with SDI Design Manual.
- B. Calculate to structural working stress design and structural properties specified.
- C. Maximum Vertical Deflection of Floor Deck: 1/360.
- D. Maximum Vertical Deflection of Roof Deck: 1/240.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittals procedures.
- B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, accessories, and cellular raceways/outlet box locations.
- C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- D. Certificates: Certify that products furnished meet or exceed specified requirements.

- E. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of recycled content type and percentage, location of extraction/recovery of primary raw materials, steel mill process, location of mill, location of fabrication and costs.
- F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- 1.5 QUALITY ASSURANCE
 - A. Domestic Origin: Consistent with the Maryland Annotated Code, Article 78A known as the "Buy American Steel" Act of the General Assembly of Maryland, Acts of 1978, provide steel manufactured in the United States of America.
 - B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of documented experience.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Cut plastic wrap to encourage ventilation.
 - B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Regional Materials: Provide at least 50 percent of steel manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.
 - B. Canam Steel Corporation: www.canam-steeljoists.ws.
 - C. Consolidated Systems, Inc.
 - D. Epic Metals Corporation.
 - E. Nucor-Vulcraft Group: www.vulcraft.com.
 - F. Wheeling Corrugating Co: www.wheelingcorrugating.com.
- 2.2 STEEL DECK
 - A. Recycled Content: Provide steel with at least 50 percent recycled content.
 - B. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
 - 1. Calculate to structural working stress design and structural properties specified.
 - 2. Maximum Vertical Deflection of Floor Deck: 1/360 of span.
 - 3. Maximum Vertical Deflection of Roof Deck: 1/240.
 - 4. Maximum Vertical Deflection of Form Deck: 1/360 of span.
 - C. Acoustical Roof Deck: Non-composite type, steel sheet with plain vertical flute faces perforated with 1/8 inch diameter holes staggered 3/8 inch on center:
 - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS), with G90/Z275 galvanized coating.
 - a. Grade 33
 - 2. Sound absorbing elements and spacers shall be furnished under this section for installation by the roofing contractor.
 - D. Roof Deck: Non-composite type, fluted steel sheet:

- 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS), with G90/Z275 galvanized coating.
 - a. Grade 33.
- 2. Structural Properties:
 - a. Section modulus: 0.247.
 - b. Span Design: 3 Span condition.
- 3. Minimum Base Metal Thickness: 20 gage, 0.0359 inch.
- 4. Nominal Height: 1-1/2 inch.
- 5. Profile: Fluted; SDI WR.
- 6. Formed Sheet Width: 36 inch.
- 7. Side Joints: Lapped, mechanically fastened.
- 8. End Joints: Lapped, welded.
- E. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
 - Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 50, Type 1.
 a. Grade 50.
 - 2. Primer: Shop coat over cleaned and phosphatized substrate.
 - 3. Structural Properties:
 - a. Section modulus: 0.355.
 - 4. Span Design: 3 Span condition.
 - 5. Minimum Base Metal Thickness: 20 gage, 0.0359 inch.
 - 6. Nominal Height: 2 inches.
 - 7. Profile: Fluted; SDI WR.
 - 8. Formed Sheet Width: 36 inch.
 - 9. Side Joints: Lapped, welded.
 - 10. End Joints: Lapped, welded.

2.3 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A36/A36M steel.
- B. Stud Shear Connectors: Made from ASTM A 108 Grade 1015 bars.
- C. Welding Materials: AWS D1.1/D1.1M.
- D. Fasteners: Galvanized hardened steel, self tapping.
- E. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- F. Shop and Touch-Up Primer: Type specified in Section 09 91 23 Interior Painting, complying with VOC limitations of authorities having jurisdiction.
- G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- H. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
- I. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft density; profiled to suit deck.

2.4 FABRICATED DECK ACCESSORIES

- A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 22 gage, 0.0299 inch thick sheet steel; of profile and size as indicated; finished same as deck.
- B. Cant Strips: Formed sheet steel, 16 gage, 3 1/2 inch minimum thickness, 45 degree slope, 3-1/2 inch nominal width and height, flange for attachment.

- C. Roof Sump Pans: Formed sheet steel, 14 gage, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.
- D. Floor Drain Pans: Formed sheet steel, 14 gage, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below floor deck surface, bearing flange 3 inches wide, sealed watertight.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.2 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before permanently fastening.
- C. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck and support of other work.
- D. On concrete and masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 3 inch bearing.
- D. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.
 1. Welding: Use fusion welds through weld washers.
- E. At mechanically fastened male/female side laps fasten at 24 inches on center maximum.
- F. At welded male/female side laps weld at 18 inches on center maximum.
- G. Weld deck in accordance with AWS D1.3/D1.3M.
- H. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches on center maximum.
- I. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.
- J. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- K. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
- L. Place metal cant strips in position and fusion weld.
- M. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- N. Position floor drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- O. Weld stud shear connectors through steel deck to structural members below.
- P. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

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 1¹/₂ inches long, and as follows:
 - 1. Weld Diameter: 3/4 inch, nominal.
 - 2. Weld Spacing: Weld edge ribs of panel at each support; space additional welds at 12" o.c. and as indicated on Drawings.
- 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 indicated on Drawings.
 - 1. Mechanically fasten with self-drilling, No.10 diameter or larger, carbon-steel screws.
 - 2. Fasten with a minimum of $1\frac{1}{2}$ inch-long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of $1\frac{1}{2}$ inches, with end joints lapped 2 inches minimum.

3.4 FLOOR DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
 - 1. Weld Diameter: 3/4 inch, nominal.
 - 2. Weld Spacing: Weld edge ribs of panel at each support and at 12" on center.
- B. Side-lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of half of the span or 36 inches, and as indicated on Drawings.
 - 1. Fasten with a minimum of $1\frac{1}{2}$ inch long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of $1\frac{1}{2}$ inches, with end joints butted.

3.3 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00. Inspection services shall conform to Section1705.2 of the 2015 IBC Code and the Statement of Special Inspections noted in the structural drawings.
- B. Inspection to include, but not limited to, deck alignment, support, welds, side lap attachment and touch-up galvanizing.
- C. Testing agency to 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, must be performed to determine compliance of corrected work with specified requirements.

END OF SECTION
SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formed steel stud exterior wall framing.
- B. Formed steel joist framing and bridging.
- C. Any other framing identified on the drawings as Cold-Formed Metal Framing.

1.2 REFERENCE STANDARDS

- A. AISI S100-12 North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
- B. AISI SG02-1 North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- C. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- E. ASTM A1008/A1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2013.
- F. ASTM C955 Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.
- G. AWS D1.1/D1.1M Structural Welding Code Steel; American Welding Society; 2010 w/Errata.
- H. SSPC-Paint 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- I. IBC 2015 International Building Code.

1.3 DESIGN REQUIRMENTS

- A. Axial and lateral load bearing elements shall be designed to the following conditions unless more stringent requirements are imposed by governing code; these requirements take precedent when more stringent than governing code.
 - 1. Live/Snow Loads on Roofs: Per Code.
 - 2. Dead Load Pitched Roof Rafters or Trusses: Total of all permanently installed material including roofing, structural frame, accessories and all equipment that is fixed in position.
 - 3. Wind Loads: Loads specified in pressure study prepared by the licensed Professional Engineer.
 - 4. Seismic Loads: Per ASCE 7-2010.
 - 4. Gravity loads should be per ASCE 7-2010.
- B. Maximum Allowable Deflection:
 - 1. Backing of Masonry Veneer: 1: 600.
 - 2. Other Systems: 1: 240 of span.
- C. Wall and General System:
 - 1. Design to AISI SG-973 Cold-Formed Steel Design Manual.

- 2. Design to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
- 3. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- 4. Design to meet loading and anchorage requirements for window systems and curtainwall system must be based on calculations provided by the respective subcontractors.
- 5. Design cold-formed metal truss framing for exterior soffits to meet applicable wind uplift requirements.
- 6. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as in accordance with IBC code.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.
- C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
 - 1. Indicate stud and ceiling joist layout.
 - 2. Describe method for securing studs to tracks and for bolted framing connections.
 - 3. Provide calculations for loadings and stresses of specially fabricated framing, stamped by a Professional Structural Engineer licensed in the State in which the Project is located, who is responsible for its preparation.
 - 4. Provide details, shop drawings and calculations for factory-made framing connectors, stamped by a Professional Structural Engineer licensed in the State in which the Project is located, who is responsible for its preparation.
- E. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of recycled content type and percentage, location of extraction/recovery of primary raw materials, steel mill process, location of mill, location of fabrication and costs.

1.5 QUALITY ASSURANCE

- A. Domestic Origin: Consistent with the Maryland Annotated Code, Article 78A known as the "Buy American Steel" Act of the General Assembly of Maryland, Acts of 1978, provide steel manufactured in the United States of America.
- B. Calculate structural properties of framing members in accordance with requirements of AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
 - 1. Maintain one copy of document on project site.
- C. Design structural elements under the direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Maryland.

1.6 PROJECT CONDITIONS

A. Verify that field measurements are as indicated on the drawings.

PART 2 PRODUCTS

2.1 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

2.2 FRAMING MATERIALS

- A. Regional Materials: Provide at least 25 percent of steel manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.
- B. Recycled Content: Provide steel with at least 25 percent post-consumer recycled content.
- C. Studs and Track: ASTM C955; studs formed to channel, "C" shape with punched web; U-shaped track in matching nominal width and compatible height.
 - 1. Gage and Depth: As indicated on the drawings and as required to meet specified performance levels..
 - 2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.
 - 3. Provide components fabricated from ASTM A 1008/A 1008M, Designation SS steel.
 - 4. Grade: As indicated on drawings.
- D. Framing Connectors: Factory-made, formed steel sheet.
 - 1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members; minimum 16 gage, 0.06 inch thickness.
 - 2. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
 - a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
 - b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
 - c. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
 - d. Acceptable Products: VertiClip(r) or DriftClip(tm) manufactured by The Steel Network Inc.
 - 3. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

2.3 ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
- B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.4 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

- B. Anchorage Devices: Powder actuated.
- C. Welding: In conformance with AWS D1.1/D1.1M.

2.5 SHOP FABRICATED ASSEMBLIES

- A. Shop fabricate metal framing to the greatest extent possible.
- B. Fabricate assemblies of framed sections of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.
- C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 EXECUTION

3.1 INSTALLATION OF STUDS

- A. Install components in accordance with manufacturers' instructions and ASTM C 1007 requirements.
- B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.
- C. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- D. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
- E. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
- F. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- G. Install intermediate studs above and below openings to align with wall stud spacing.
- H. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- I. Attach cross studs to studs for attachment of fixtures anchored to walls.
- J. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- K. Touch-up field welds and damaged galvanized surfaces with primer.

3.2 TOLERANCES

- A. Maximum Variation from True Position: 1/8 inch.
- B. Maximum Variation of any Member from Plane: 1/8 inch.

3.4 FIELD QUALITY CONTROL

- A. Engage a qualified independent testing and inspection agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
 - 1. Perform inspections in order to assure strict conformance to the shop drawings at all phases of construction.
 - 2. Check members for proper alignment, bearing, completeness of attachments, proper alignment, reinforcement, etc.
 - 3. Check attachments for conformance with the shop drawings; all welds shall be touched up as specified.
 - 4. Complete general inspection of structure prior to applying loads to those members.

5. Inspections where and as required by local codes shall be controlled inspections. END OF SECTION

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Rough hardware.
- B. Steel ladders.
- C. Loose bearing and leveling plates.
- D. Loose steel lintels.
- E. Shelf angles.
- F. Support angles for elevator door sills.
- G. Steel framing and supports for countertops.
- H. Steel framing and supports for mechanical and electrical equipment.
- I. Steel framing and supports for applications where framing and supports are not specified in other Sections.
- J. Miscellaneous metal trim.
- K. Metal bollards.
- L. Elevator sump grates.
- M. Miscellaneous storm drainage piping specialties.

1.2 REFERENCE STANDARDS

- A. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- B. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2008.
- C. ASTM A283/A283M Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2003 (Reapproved 2007).
- D. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2012.
- E. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2012.
- F. AWS D1.1/D1.1M Structural Welding Code Steel; American Welding Society; 2010.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this Project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the Work.
- B. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel," AWS D1.2 "Structural Welding Code--Aluminum," and AWS D1.3 "Structural Welding Code--Sheet Steel."
 - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.4 SUBMITTALS

- A. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other Sections.
 - 1. For installed products indicated to comply with design loads include structural analysis data and shop drawings signed by the qualified professional engineer responsible for their preparation.
- B. Samples representative of materials and finished products as may be requested by Architect.
- C. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.
- D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project name, addresses, names of architects and owners, and other information specified.
- E. Qualification data for professional engineer responsible for designing fabrications indicated to comply with specific design loads.
- F. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Division 01 LEED sections and appropriate forms, and Section 01300.
 - 1. Provide documentation of recycled content type and percentage, location of extraction/recovery of primary raw materials, steel mill process, location of mill, location of fabrication and costs.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Metal Surfaces, General:
 - 1. For metal fabrications exposed to view in the completed Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes.
 - 2. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
 - 3. Recycled Content: Provide steel with minimum 30 percent total recycled content, 25 percent shall be post-consumer recycled content.
 - 4. Domestic Origin: Consistent with the Maryland Annotated Code, Article 78A known as the "Buy American Steel" Act of the General Assembly of Maryland, Acts of 1978, provide steel manufactured in the United States of America.
- B. Steel Sections: ASTM A 36/A 36M.

- C. Steel Tubing: Product type (manufacturing method) and as follows:
 - 1. Cold-Formed Steel Tubing: ASTM A 500.
 - 2. Hot-Formed Steel Tubing: ASTM A 501.
 - a. For exterior installations and where indicated, provide tubing with hot-dip galvanized coating per ASTM A 53.
- D. Plates: ASTM A 283.
- E. Steel Pipe: ASTM A 53, standard weight (schedule 40), unless otherwise indicated, or another weight required by structural loads.
 - 1. Galvanized finish for exterior installations and where indicated.
 - 2. Black finish elsewhere, unless otherwise indicated.
- F. Gray-Iron Castings: ASTM A 48, Class 30.
- G. Malleable-Iron Castings: ASTM A 47, Grade 32510 (ASTM A 47M, Grade 22010).
- H. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 (ASTM A 47M) malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.
- I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.2 MATERIALS - ALUMINUM

- A. General:
 - 1. Recycled Content: Give preference to aluminum with the highest recycled content feasible.
 - 2. Regional Materials: Give preference to aluminum manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.
- B. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- C. Aluminum-Alloy Rolled Tread Plate: ASTM B 632 (ASTM B 632M) Pattern 1, alloy 6061-T6.
- 2.3 PAINT
 - A. Shop Primer for Ferrous Metal Interior Locations, Loose Lintels, Plates, etc.: Refer to Division 9 painting specifications.
 - B. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.
 - C. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers.

2.4 FASTENERS

- A. General: Provide plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating, for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568, Property Class 4.6), with hex nuts, ASTM A 563 (ASTM A 563M), and, where indicated, flat washers.

- C. Machine Screws: ANSI B18.6.3.
- D. Lag Bolts: ANSI B18.2.1 (ANSI B18.2.3.8M).
- E. Plain Washers: Round, carbon steel, ANSI B18.22.1 (ANSI B18.22M).
- F. Lock Washers: Helical, spring type, carbon steel, ANSI B18.21.1.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below 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. Material General: Carbon steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
 - Material Exposed exterior or in contract with ground: Group 1 alloy 304 or 316 stainless-steel bolts and nuts complying with ASTM F 593 (ASTM F 738M) and ASTM F 594 (ASTM F 836M).
- H. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as required.
- 2.5 GROUT
 - A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
 - B. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Construction Grout; W. R. Bonsal Co.
 - 2. Sure-grip High Performance Grout; Dayton Superior Corp.
 - 3. Euco N-S Grout; Euclid Chemical Co.
 - 4. Crystex; L & M Construction Chemicals, Inc.
 - 5. Masterflow 928 and 713; Master Builders Technologies, Inc.
 - 6. Sealtight 588 Grout; W. R. Meadows, Inc.
 - 7. Sonogrout 14; Sonneborn Building Products--ChemRex, Inc.
- 2.6 FABRICATION
 - A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
 - B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
 - C. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
 - 1. Temperature Change (Range): 120 deg F.
 - D. Shear and punch metals cleanly and accurately; remove burrs.
 - E. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

- F. Remove sharp or rough areas on exposed traffic surfaces.
- G. 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 that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- H. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. 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.
- K. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- L. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.
- M. Fabricate items with joints tightly fitted and secured.
- N. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- O. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.7 ROUGH HARDWARE

- A. Furnish bent, or otherwise custom-fabricated, bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 Sections.
- B. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts that bear on wood structural connections, and furnish steel washers elsewhere.

2.8 STEEL LADDERS

- A. General: Fabricate ladders for the locations shown, with dimensions, spacings, details, and anchorages as indicated. Comply with requirements of ANSI A14.3.
- B. Siderails: Continuous, steel, 1/2-by-2-1/2-inch flat bars, with eased edges, spaced 18 inches apart.
- C. Bar Rungs: 3/4-inch diameter steel bars, spaced 12 inches o.c.
- D. Fit rungs in centerline of side rails, plug weld and grind smooth on outer rail faces.

- E. Support each ladder at top and bottom and at intermediate points spaced not more than 5 feet o.c. with welded or bolted steel brackets.
 - 1. Size brackets to support design dead and live loads indicated and to hold centerline of ladder rungs clear of the wall surface by not less than 7 inches.
 - 2. Extend side rails 42 inches above top rung, and return rails to wall or structure unless other secure handholds are provided. If the adjacent structure does not extend above the top rung, goose-neck the extended rails back to the structure to provide secure ladder access.
- F. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to the rung by a proprietary process.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - a. Mebac, IKG Borden.
 - b. SLIP-NOT, W. S. Molnar Co.
- G. Galvanize ladders, including brackets and fasteners, in the following locations:1. Elevator pit.

2.9 LOOSE STEEL LINTELS

- A. Fabricate loose structural steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- B. Weld adjoining members together to form a single unit where indicated.
- C. Size loose lintels for equal bearing of 1 inch per foot of clear span but not less than 8 inches bearing at each side of openings, unless otherwise indicated.
- D. Hot dip galvanize loose steel lintels located in exterior walls.

2.10 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

2.11 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.
- B. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.
 - 1. Equip units with integrally welded anchors; furnish inserts if units must be installed after concrete is placed.
 - a. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.
- C. Galvanize miscellaneous framing and supports in the following locations:
 - 1. Exterior locations.
 - 2. Interior locations where indicated.

2.12 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible.
- B. Provide cutouts, fittings, and anchorages as required to coordinate assembly and installation with other Work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches from each end, 6 inches from corners, and 24 inches o.c., unless otherwise indicated.
- C. Galvanize miscellaneous steel trim in the following locations:
 - 1. Exterior locations.
 - 2. Interior locations where indicated.

2.13 FRAME AND GRATE FOR ELEVATOR SUMP

- A. Basis-of-Design: Model R-4810-C by Neenah Foundry Company.
- B. Frames and grates to be Gray Iron, Class 35.

2.14 MISCELLANEOUS STORM DRAINAGE PIPING SPECIALTIES

- A. Downspout Boots: Provide downspout boots made from cast gray iron in heights indicated with inlets of size and shape to suit downspouts.
 - 1. Outlet: NPS 4 (DN 100) outlet, to discharge into pipe.
 - 2. Cast with ears to attach to building.
 - 3. Size: Inlet size to match downspout and NPS 4 (DN 100) outlet.
 - 4. Finish: Shop-applied bituminous coating.
- B. Downspout Adaptors: Provide downspout adaptors made from cast gray iron casting, for attaching to horizontal-outlet, parapet roof drain and to exterior, sheet metal downspout.
 - 1. Inlet size to match parapet drain outlet.

2.15 PIPE BOLLARDS

- A. Provide Schedule 40 black steel pipe of size and height indicated as detailed on the Drawings.
- B. Permanent Setting:
 - 1. Set posts in concrete to a depth of 3'-0"; footing diameter minimum 3 times post diameter.
 - 2. Fill posts completely with concrete and dome on top.
- C. Finish: Painted as specified in Division 9 "Exterior Painting."

2.16 FINISHES - STEEL AND IRON

- A. Galvanizing: For those items indicated for galvanizing, apply zinc coating by the hot-dip process complying with the following requirements:
 - 1. ASTM A 153 for galvanizing iron and steel hardware.
 - 2. ASTM A 123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch (0.76 mm) thick or thicker.
- B. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
 - 1. Exteriors (SSPC Zone 1B): SSPC-SP 6 "Commercial Blast Cleaning."
 - 2. Interiors (SSPC Zone 1A): SSPC-SP 3 "Power Tool Cleaning."

C. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA 1 "Paint Application Specification No. 1" for shop painting.

2.17 FINISHES - ALUMINUM

- A. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- B. As-Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).
- C. Class I Natural Anodized Finish (unless indicated otherwise): AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

2.18 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

- 3.1 PREPARATION
 - A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.
 - B. Set sleeves in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entry.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.
- D. 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 the surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.
- E. 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 that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.3 SETTING LOOSE PLATES

- A. Clean concrete bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
- B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout.
 - 1. Use nonshrink, nonmetallic grout, unless otherwise indicated.
 - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 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 as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a 2.0-mil (0.05-mm) minimum dry film thickness.
- B. For galvanized surfaces, clean welds, bolted connections, and abraded areas, and apply galvanizing repair paint to comply with ASTM A 780.

SECTION 05 51 00 - METAL STAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Stairs with concrete treads.
- B. Structural steel stair framing and supports.
- 1.2 RELATED REQUIREMENTS
 - A. Section 03 30 00 Cast-in-Place Concrete: Placement of metal anchors in concrete.
 - B. Section 04 20 00 Unit Masonry: Placement of metal fabrications in masonry.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2008.
- B. AWS D1.1/D1.1M Structural Welding Code Steel; American Welding Society; 2010.
- C. SSPC-SP 2 Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 1. Include the design engineer's stamp or seal on each sheet of shop drawings.
- C. Delegated Design Data: As required by authorities having jurisdiction.
- D. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of recycled content type and percentage, location of extraction/recovery of primary raw materials, location of fabrication and costs.
- E. Welders' Certificates.

1.5 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State of Maryland, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

- 2.1 METAL STAIRS GENERAL
 - A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
 - 1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.

- 2. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code.
- 3. Dimensions: As indicated on drawings.
- 4. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
- 5. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
- 6. Separate dissimilar metals using paint or permanent tape.
- B. Metal Jointing and Finish Quality Levels:
 - 1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
 - a. Welded Joints: Continuously welded and ground smooth and flush.
 - b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
 - c. Exposed Edges and Corners: Eased to small uniform radius.
 - d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.2 METAL STAIRS WITH CONCRETE TREADS

- A. Jointing and Finish Quality Level: Architectural, as defined above.
- B. Typical Risers: Closed.
- C. Risers at Open Stair: Perforated Metal.
 - 1. Gage: 14 ga.
 - 2. Perforation: 1/8 inch diameter holes at 1/2 inch on center, staggered.
- D. Treads: Metal pan with field-installed concrete fill.
 - 1. Concrete Depth: 1-1/2 inches, minimum.
 - 2. Tread Pan Material: Steel sheet.
 - 3. Tread Pan Thickness: As required by design; 14 gage, 0.075 inch minimum.
 - 4. Concrete Reinforcement: None.
 - 5. Concrete Finish: For resilient floor covering.
- E. Risers: Same material and thickness as tread pans.
 - 1. Nosing Depth: Not more than 1-1/2 inch overhang.
 - 2. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch wide.
- F. Stringers: Rolled steel channels.
 - 1. Stringer Depth: 12 inches unless greater is indicated on Drawings.
 - 2. End Closure: Sheet steel of same thickness as risers welded across ends.
- G. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.
- H. Finish: Shop- or factory-prime painted.
- I. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.3 MATERIALS

A. Steel Sections: ASTM A 36/A 36M.

- B. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
 - 1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
 - 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
- C. Concrete Fill: Portland cement Type I, 3000 psi 28 day strength, 2 to 3 inch slump.
- D. Concrete Reinforcement: Mesh type as detailed, unfinished.
- 2.4 SHOP FINISHING
 - A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
 - B. Do not prime surfaces in direct contact with concrete or where field welding is required.
 - C. Prime Painting: Use specified shop- and touch-up primer.
 - 1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
 - 2. Number of Coats: One.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- 3.2 PREPARATION
 - A. When field welding is required, clean and strip primed steel items to bare metal.
 - B. Supply items required to be cast into concrete and embedded in masonry with setting templates.
- 3.3 INSTALLATION
 - A. Install components plumb and level, accurately fitted, free from distortion or defects.
 - B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
 - C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
 - D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1.
 - E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
 - F. Obtain approval prior to site cutting or creating adjustments not scheduled.
 - G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.4 TOLERANCES

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

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted handrails.
- B. Stair railings and guardrails.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 04 20 00 Unit Masonry: Placement of anchors in masonry.
- C. Section 09 21 16 Gypsum Board Assemblies: Placement of backing plates in stud wall construction.
- D. Section 09 21 16 Gypsum Board Assemblies: Placement of backing plates in stud wall construction.

1.3 REFERENCE STANDARDS

- A. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- B. ASTM A500/A500M Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
- C. ASTM E935 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).
- D. ASTM E985 Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).
- E. SSPC-Paint 15 Steel Joist Shop Paint; The Society for Protective Coatings; 1999 (Ed. 2004).

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Non-welded field connections in aluminum handrails to be limited to greatest fabricated section lengths; locations accepted by Architect and consistent for multiple locations.
- C. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - 1. Provide documentation of recycled content type and percentage, location of extraction/recovery of primary raw materials, location of fabrication and costs.

1.5 QUALITY ASSURANCE

- A. Mock-up: Build mock-up section of guardrail with attached handrail to demonstrate aesthetic effects and set quality standards for fabrication and erection.
 - 1. Size: 42 inches high x 48 inches wide.

PART 2 PRODUCTS

2.1 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
- B. Design railing assembly, wall rails, and attachments to resist lateral force of 75 lbs at any point without damage or permanent set. Test in accordance with ASTM E 935.
- C. Allow for expansion and contraction of members and building movement without damage to connections or members.
- D. Dimensions: See drawings for configurations and heights.
 - 1. Infill: Round vertical pickets; size and spacing indicated on drawings.
- E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
 - 2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
 - 3. For anchorage to stud walls, provide backing plates, for bolting anchors.
- F. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- G. Recycled Content: Provide steel tube and pipe with minimum 30 percent total recycled content including at least 25 percent post-consumer recycled content.

2.2 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A 500, Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- C. Stainless steel tubing: ASTM A269, Type 304 with No. 4 brushed finish.
- D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.3 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components: Continuously seal joined pieces by continuous welds.

- 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- 4. Select proper welding method to result in consistent finish with final finish.
- E. Hand rail: Fabricate from stainless steel with internal channels to receive bracket mounts.
- F. Connector sleeves: Open tube section for joining rails and mitered corners. Fabricate from same metal and finish as rails. Diameter to allow for tight insertion into rail.
 - 1. Supply fasteners and other components required for anchorage of railings.
- G. Non-Weld Field Connections: Interior connector sleeves; set with epoxy adhesive within rail and provide stainless steel set screws concealed on underside of rail.
 - 1. Provide for connecting longest practicable sections of stainless steel handrails with shop welded bends, miters and brushed finish.

PART 3 EXECUTION

- 3.1 INSTALLATION
 - A. Install in accordance with manufacturer's instructions.
 - B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
 - C. Anchor railings securely to structure.
 - D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
 - E. Aluminum Handrail Field Joints:
 - 1. Clean area to be joined thoroughly.
 - 2. Apply epoxy adhesive to inside of pipe.
 - 3. Insert sleeve and fit components together, wipe excessive adhesive.
 - 4. Provide stainless steel set screws concealed on underside of handrail; fill head with epoxy setting adhesive and clean excess.

3.2 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

SECTION 05 53 20 - STAIR NOSINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Extruded aluminum stair nosings.

1.2 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturers product specifications, installation and maintenance instructions.
- C. Samples for initial selection, in the form of manufacturer's color charts or sections of units showing the full range of colors.
- D. Samples for verification, in the form of sections of units in manufacturer's standard sizes; prepare samples from same material to be used for the Work.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain stair nosings from one source and from a single manufacturer.
- 1.4 SEQUENCING AND SCHEDULING
 - A. Coordinate with metal stairs so that nosing sub-bases are available for placing integrally with metal pan stair fill.

PART 2 PRODUCTS

- 2.1 EXTRUDED ABRASIVE NOSINGS
 - A. Provide extruded aluminum units with abrasive filler consisting of aluminum oxide or silicon carbide grits, or a combination of both, in an epoxy-resin binder. Furnish in lengths as required to accurately fit each opening or conditions.
 - 1. Provide ribbed units, with abrasive filler strips projecting 1/16 inch (1.5 mm) above the aluminum extrusion and having the maximum recycled content feasible.
 - a. Primary Color: To be selected.
 - b. Highlight Color: Contrasting; to be selected.
 - 2. Provide two-piece design. Sub-channel to be set with stair pan fill (use plywood filler for tread).
 - B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. American Safety Tread Co., Inc.; TP-311 Ribbed
 - 2. Arden Architectural Specialties, Inc.; N-TB30
 - 3. Balco/Metalines, Inc.; DST-330
 - C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with the manufacturer.
 - D. Drill for mechanical anchors with countersunk holes located not more than 4 inches (100 mm) from ends and not more than 12 inches (300 mm) o.c., evenly spaced between ends, unless otherwise indicated. Provide closer spacing if recommended by the manufacturer.
 - E. Set elevation of sub-channel and concrete fill levels to provide flush installation to top of finish.
 - F. Provide curved nosings at curved stairs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Furnish sub-channel to pre-filled stair pan fabricator and exterior concrete step installer for installation at appropriate time.
- B. Field measure and verify stair dimensions for nosing lengths prior to ordering.

3.2 INSTALLATION

- A. Install stair nosings in accordance with manufacturer's instructions.
- B. Install sub-channel with concrete fill.
- C. Install tread insert prior to Substantial Completion and protect from damage until acceptance; set insert in sealant applied to sub-channel and clean any sealant seeping from joint following installation of insert.
- D. Work shall be aligned plumb, level, and, where required, flush with adjacent surfaces and rigidly anchored to the substrate.
- E. Clean exposed surfaces as recommended by the manufacturer.

SECTION 05 58 13 - COLUMN COVERS

PART 1 GENERAL

- 1.1 This Section includes:
 - A. Decorative column covers.

1.2 SUBMITTALS

- A. 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.
- B. Shop Drawings:
 - 1. Shop drawings shall show dimensions, sizes, thickness, alloy(s), temper(s), finishes, joint(s), attachments and the relationship of adjoining work.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, which depict actual product, color, and patterns.
- E. Certification:
 - 1. Submit certificates from column cover manufacturer attesting that products comply with specified requirements, including finish as specified.
 - 2. Submit list of projects completed. Projects listed shall be of similar type, scope and size, and shall have all necessary contact information for verification by the owner or Architect of Record.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Single manufacturer with a minimum of ten projects of similar size and scope in the past five years shall manufacture, fabricate and deliver column covers and all primary products specified in this section.
- B. Installer / Fabricator Qualifications: Fabricator shall have a minimum of five years experience installing systems of similar type and scope as those specified in this section.
 - 1. Fabricator must own and operate facilities capable of creating and finishing all metal components.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect all materials during fabrication, shipment, site storage and erection to prevent damage to the finished work from other trades.
- B. Store column covers inside a well-ventilated area, away from uncured concrete and masonry and protected from weather, moisture, soiling, abrasion, extreme temperatures and humidity.
- C. Store and dispose solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 WARRANTY

- A. Upon project close-out, provide Owner with a copy of the manufacturers standard one (1) year limited warranty against manufacturing defect on the column covers.
- B. Warranty on Column Cover Finishes may be extended up to a maximum of twenty-five (25) years following date of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: 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.
 - 1. C/S Group.
 - 2. Fry Reglet Architectural Metals.
 - 3. Metalwerks.
 - 4. Nelson Industrial Inc.
 - 5. Pittcon.

2.2 MATERIALS

- A. All secondary mounting posts, anchors, clips and fasteners are to be provided as a complete package of this work.
- B. No exposed fasteners for metal closures are allowed.
- C. Aluminum:
 - 1. Minimum 0.090 inch thickness.
 - 2. Finish: Fluoropolymer coating containing minimum 70 percent Kynar resin or epoxy powder coat finish; match Architect's sample for color.

2.3 FABRICATION

- A. Design:
 - 1. Column covers shall have a closed vertical joint
 - 2. Provide recessed base and ceiling details.
 - 3. Provide horizontal reveal at elevations indicated above finished floor.
 - 4. Column covers are to extend above finished ceilings or to underside of structure if cover does not intersect a finished ceiling.
- B. Column cover shall be manufactured true to round geometry as shown on plan view of architectural drawings with a tolerance of +/- 1/16 inch (1.5mm).

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install column cover in accordance with manufacturer's written installation instructions and shop drawings.
- B. Column cover shall be erected plumb, level, square, true to line, securely anchored, and in proper alignment and relationship to work of other trades.
- C. Column cover shall be inspected before installation to be free from dents, scratches and other defects.

3.2 CLEANING

- A. Removal of protective covering shall occur immediately after installation to prevent adhesive transfer.
- B. Clean all surfaces following installation.
- C. Maintenance per manufacturer's finish maintenance instructions.

3.3 PROTECTION

A. Protection of column covers from damage by other trades after installation to be provided by general contractor.

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preservative treated wood materials.
- B. Fire retardant treated wood materials.
- C. Miscellaneous framing and sheathing.
- D. Communications and electrical room mounting boards.
- E. Concealed wood blocking, nailers, and supports.
- F. Miscellaneous wood nailers, furring, and grounds.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions.

1.3 REFERENCE STANDARDS

- A. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM D2898 Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.
- C. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.
- D. AWPA U1 Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2010.
- E. PS 20 American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials and application instructions.
- C. LEED Submittals: Submit applicable LEED Submittal Form for each different product made of sustainably harvested wood, salvaged and reused wood, wood fabricated from recovered timber, as well as locally-sourced wood, as specified in Section 01 35 15.
- D. LEED Submittal: Provide documentation indicating no added urea formaldehyde for composite wood and agrifiber products.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
- B. Lumber fabricated from old growth timber is not permitted.
- C. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body.
- D. Composite Wood and Agrifiber Products (including treated plywood substrates) installed within the building waterproofing envelope: No added urea formaldehyde resins.
- E. Regional Materials: Give preference to wood manufactured and harvested within 500 mile radius of Project Site.
- F. Factory mark each piece of lumber with grade stamp of grading agency.
- G. Use Exterior type for exterior locations and where indicated. For all roof and parapet blocking (to include plywood where utilized) provide exterior fire treated product.
 - 1. Basis-of-Design: Hoover Exterior Fire-X.
- H. Adhesives and sealants applied within the building waterproofing envelope: Comply with lowemitting requirements in Division 01 Section "Indoor Air Quality Requirements."
- 2.2 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
 - A. Sizes: Nominal sizes as indicated on drawings, S4S.
 - B. Moisture Content: S-dry or MC19.
 - C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.3 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.4 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.5 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

- 1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
- 2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Fire Retardant Treatment:
 - 1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Treat all exterior rough carpentry items.
 - c. Do not use treated wood in direct contact with the ground.
 - d. Treat wood blocking installed in built-up thickness for roofing terminations except top layer in direct contact with roofing membrane.
 - 2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Treat rough carpentry items as indicated .
 - c. Do not use treated wood in applications exposed to weather or where the wood may become wet.
- C. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
 - 1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - 2. Treat lumber in contact with roofing, flashing, or waterproofing.
 - 3. Treat lumber in contact with masonry or concrete.
 - 4. Treat lumber less than 18 inches above grade.
 - 5. Treat lumber in other locations as indicated.
 - 6. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
 - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
 - b. Treat plywood in contact with roofing, flashing, or waterproofing.
 - c. Treat plywood in contact with masonry or concrete.
 - d. Treat plywood less than 18 inches above grade.
 - e. Treat plywood in other locations as indicated.
- D. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative to 0.4 lb/cu ft retention.
 - 1. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

PART 3 EXECUTION

- 3.1 INSTALLATION GENERAL
 - A. Select material sizes to minimize waste.
 - B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
 - C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.
- 3.2 BLOCKING, NAILERS, AND SUPPORTS
 - A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
 - B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
 - C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

3.3 INSTALLATION OF CONSTRUCTION PANELS

- A. Communications and Electrical Room Mounting Boards: Secure with screws to stude with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into stude in field of board.
 - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 - 3. Install adjacent boards without gaps.

SECTION 06 20 00 - FINISH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Finish carpentry items.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions.

1.3 REFERENCE STANDARDS

- A. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.
- B. AWI/AWMAC/WI (AWS) Architectural Woodwork Standards; 2009.
- C. AWI/AWMAC (QSI) Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.
- D. AWPA C2 Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2003.
- E. HPVA HP-1 American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association; 2004.
- F. NEMA LD 3 High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide data on fire retardant treatment materials and application instructions.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, to a minimum scale of 1-1/2 inch to 1 ft.
- D. Samples: Submit two samples of finish plywood, 24 inches x 24 inch in size illustrating wood grain and specified finish.
- E. LEED Report: Submit for wood products made from sustainably harvested wood, salvaged and reused wood, wood fabricated from recovered timber, and locally-sourced wood, as specified in Section 01 35 15.
- F. LEED Submittals: Provide documentation of VOC content in g/L for adhesives applied within the building envelope; document no added urea formaldehyde for composite wood, agrifiber products and laminating adhesives.

1.5 QUALITY ASSURANCE

- A. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body. All non-FSC wood in assemblies with FSC-certified wood shall meet the FSC Controlled Wood (CW) criteria.
- B. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom grade.

- C. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
- D. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.
- E. Mockup: Build a mockup panel with samples of exposed trim, for this Project, applied to demonstrate treatment of fasteners and joints between trim sections.
- 1.6 REGULATORY REQUIREMENTS
 - A. Conform to applicable code for fire retardant requirements.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Protect work from moisture damage.
- 1.8 PROJECT CONDITIONS
 - A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
 - B. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

PART 2 PRODUCTS

- 2.1 FINISH CARPENTRY ITEMS
 - A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards for Premium Grade.
 - B. Composite Wood and Agrifiber Products (installed within the building waterproofing envelope): No added urea formaldehyde.
 - C. Laminating Adhesives: No added urea formaldehyde.
 - D. Wood Adhesives (installed within the building waterproofing envelope): Comply with Section 01 61 16.
- 2.2 WOOD-BASED COMPONENTS
 - A. Wood fabricated from old growth timber is not permitted.

2.3 LUMBER MATERIALS

A. Hardwood Lumber: Maple species, plain sawn, maximum moisture content of 6 percent, of quality suitable for transparent finish.

2.4 SHEET MATERIALS

A. Hardwood Plywood: HPVA HP-1, Grade AA, Type II; Veneer core, type of glue recommended for application; Maple face species, rotary cut.

2.5 PLASTIC LAMINATE MATERIALS

- A. Plastic Laminate: NEMA LD 3, HGS; color as selected; textured, low gloss finish .
- B. Laminate Backing Sheet: NEMA LD 3, BKL; undecorated plastic laminate.

2.6 ADHESIVE

- A. Adhesive: Type recommended by laminate manufacturer to suit application .
 - 1. Comply to VOC limits of Section 01 61 16.

2.7 ACCESSORIES

A. Wood Filler: Solvent base, tinted to match surface finish color.

2.8 WOOD TREATMENT

- A. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
- B. Wood Preservative by Pressure Treatment (PT Type): AWPA Treatment C2 using water borne preservative with 0.25 percent retainage.
- C. Provide identification on fire retardant treated material.
- D. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.
- E. Redry wood after pressure treatment to maximum 19 percent moisture content.

2.9 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.
- C. Cap exposed plastic laminate finish edges with 3mm polyvinylchloride (PVC), machine applied with hot melt adhesive, inside/outside length radiused, corner radiused and buffed.
 - 1. Color selection for PVC edging will be made at a later date; Architect reserves the right to select colors manufactured and offered by Woodtape Edge Banding (at no additional cost to the Owner), when a standard selection offered by the casework manufacturer does not provide a suitable color in the Architect's opinion.
- D. Shop prepare and identify components for book match grain matching during site erection.
- E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- F. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
- G. Apply laminate backing sheet to reverse face of plastic laminate finished surfaces.

2.10 SHOP FINISHING

- A. Apply wood filler in exposed nail and screw indentations.
- B. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- C. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 Finishing for Grade specified and as follows:
 - 1. Transparent: Conversion varnish (formerly TR-4).
 - 2. Opaque: Catalyzed polyurethane (formerly OP-6).
- D. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify adequacy of backing and support framing.

3.2 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.3 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

SECTION 06 41 00 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Specially fabricated cabinet units.
 - B. Cabinet hardware.
 - C. Factory finishing.
- 1.2 **DEFINITIONS**
 - A. Work of this Section is typically referred as "Millwork" on the Drawings.
- **1.3 RELATED REQUIREMENTS**
 - A. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions.
- 1.4 REFERENCE STANDARDS
 - A. ANSI A135.4 American National Standard for Basic Hardboard; 2004.
 - B. ANSI A208.1 American National Standard for Particleboard; 2009.
 - C. ANSI A208.2 American National Standard for Medium Density Fiberboard for Interior Use; 2009.
 - D. AWI/AWMAC/WI (AWS) Architectural Woodwork Standards; 2009.
 - E. AWI/AWMAC (QSI) Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.
 - F. HPVA HP-1 American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association; 2004 (ANSI/HPVA HP-1).
 - G. NEMA LD 3 High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.
 - H. NHLA G-101 Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 2007.

1.5 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet and shelf unit substrate and finish.
- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- F. LEED Report: Submit documentation for wood products made from sustainably harvested wood, use of recycled materials and local/regional materials, as required by Division 01 LEED sections, appropriate forms, and Section 013000.
 - 1. Provide documentation of recycled content type and percentage location of extraction/recovery of primary raw materials, steel mill process, location of mill, location of fabrication and costs.

G. LEED Submittals: Provide documentation of VOC content in g/L for adhesives applied within the building waterproofing envelope; document no added urea formaldehyde for composite wood, agrifiber products and laminating adhesives.

1.6 QUALITY ASSURANCE

- A. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body. All non-FSC wood in assemblies with FSC-certified wood shall meet the FSC Controlled Wood (CW) criteria.
- B. Perform cabinet construction in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated as follows:
 - 1. Reception Cabinets: Premium quality.
 - 2. Other Cabinets: Custom quality.
- C. Manufacturer Qualifications: Member in good standing of the Architectural Woodwork Institute (AWI) or the Architectural Woodwork Manufacturers Association of Canada (AWMAC) and familiar with the AWI/AWMAC QSI.
- D. Quality Certification: Provide inspection and quality certification of completed custom cabinets in accordance with AWI/AWMAC Quality Certification Program.
- 1.7 PRE-INSTALLATION MEETING
 - A. Convene not less than one week before starting work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.
- 1.9 FIELD CONDITIONS
 - A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

- 2.1 CABINETS
 - A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI Architectural Woodwork Standards for Premium Grade.
- 2.2 WOOD-BASED COMPONENTS
 - A. Wood fabricated from old growth timber is not permitted.
 - B. Provide composite wood and agrifiber products manufactured with glues containing no added urea-formaldehyde.

2.3 LUMBER MATERIALS

- A. Hardwood Lumber: NHLA; Graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Grade II/Custom; average moisture content of 5-10 percent; species as follows:
 - 1. Exposed Surfaces: Species Maple.

2.4 PANEL MATERIALS

A. Veneer Faced Plywood Finish: HPVA HP-1; graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, core of particleboard, medium density

fiberboard, strawboard, or engineered combination of core materials listed; type of glue recommended for specific application; thickness as required; face veneer as follows:

- 1. Exposed Surfaces: Grade AA, Maple, rotary cut, book-matched.
- B. Particleboard: ANSI A208.1; medium density industrial type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, composed of wood chips bonded with interior grade adhesive under heat and pressure; sanded faces; thickness as required; use for components indicated on drawings.
 - 1. Density: 47-pound density or as required by the referenced standard, whichever is the more stringent.
 - 2. Recycled Content: Minimum 80 percent.
- C. Medium Density Fiberboard (MDF): ANSI A208.2; type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated; composed of wood fibers pressure bonded with moisture resistant adhesive to suit application; sanded faces; thickness as required.
 - 1. Use as backing for plastic laminate unless otherwise indicated.
 - 2. Recycled Content: Minimum 80 percent.
- D. Hardboard: AHA A135.4; Pressed wood fiber with resin binder, Class 1 Tempered, 1/4 inch thick, smooth two sides (S2S); use for drawer bottoms, dust panels, and other components indicated on drawings.
- E. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.5 LAMINATE MATERIALS

- A. Manufacturers:
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications and as follows:
 - 1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, .
 - 2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, .
 - 3. Cabinet Liner: CLS, 0.020 inch nominal thickness, through color, .
 - 4. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.
- 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. Coordinate with Section 12 35 50 to provide the same laminates for work in that section as this section.
 - 2. As selected by Architect from laminate manufacturer's full range in solid colors, wood grains, metals, and patterns, in matte finish.
 - 3. Ten different colors may be selected by Architect for this Project.

2.6 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application. No added urea formaldehyde.
 1. Field-applied Wood Adhesive: VOC content not to exceed 30 g/L.
- B. Edges:
 - 1. Cabinet body leading edges and drawer box edging shall be flat edge 0.020 inch (0.51mm) polyvinylchloride (PVC), machine applied with hot melt adhesive.
- 2. Doors and drawer edges and front and rear shelf edges shall be edged with 3mm polyvinylchloride (PVC), machine applied with hot melt adhesive, inside/outside length radiused, corner radiused and buffed.
- 3. Color selection for PVC edging will be made at a later date; Architect reserves the right to select colors manufactured and offered by Woodtape Edge Banding (at no additional cost to the Owner), when a standard selection offered by the casework manufacturer does not provide a suitable color in the Architect's opinion.
- C. Fasteners: Size and type to suit application.
- D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- E. Grommets for Cable Passage through Countertops: 2-1/2 inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
 - 1. Product: Subject to compliance with requirements, provide "EDP series" by Doug Mockett and Co., Inc.
 - 2. Coordinate color with countertop; provide white with white countertops; black color elsewhere.

2.7 HARDWARE

- A. Hardware Standard: Hinges, pulls, catches, drawer slides, locks and latches for millwork cabinetry, to be match to hardware included under Division 12 casework section; hardware finishes to match hardware included under the Division 12 casework section.
- B. Piano Hinges:
 - 1. Material: Steel; polished nickel finish.
 - 2. Open Width: 2 inches.
 - 3. Gage: Minimum 0.04 inch.
 - 4. Pin Diameter: Minimum 0.09 inch.
 - 5. Basis-of-Design product Model 351.09.643 by Hafele.
- C. Surface-mounted "Rakks" Counter Brackets: L-shaped bracket fabricated from aluminum T sections; Model No. EH-1818 and EH-1824 as manufactured by Rangine Corporation.
 - 1. Load capacity per bracket: 450 pounds.
 - 2. Finish: Custom powder paint coating.
 - 3. Provide with 5/8 inch opening rubber grommet installed in 7/8 inch hole.
- D. Coat Hooks:
 - 1. Basis-of-Design: Model K-21 Series by Magnuson Group, Inc.; Model 980 by Datum; Model A19 by EMCO Specialty Products Inc., or comparable product.
 - 2. Height: Approximately 6 inches.
 - 3. Depth: Approximately 3 inches.
 - 4. Width: 3/4 inch.
 - 5. Finish: Anodized aluminum.

2.8 FABRICATION

- A. Cabinet Style: Flush overlay.
- B. Cabinet Doors and Drawer Fronts: Flush style.
- C. Drawer Construction Technique: Dovetail joints.

- D. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- E. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- F. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- G. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
 - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 - 2. Cap exposed plastic laminate finish edges with polyvinylchloride (PVC), machine applied with hot melt adhesive.

2.9 FACTORY FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
- C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- D. Finish work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1500, As scheduled.
- E. Match materials and finish of adjacent panels or frame when providing fillers in the final installation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of backing and support framing.
- 3.2 INSTALLATION
 - A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
 - B. Use fixture attachments in concealed locations for wall mounted components.
 - C. Use concealed joint fasteners to align and secure adjoining cabinet units.
 - D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
 - E. Secure cabinets to floor using appropriate angles and anchorages.

3.3 ADJUSTING

A. Adjust installed work.

3.4 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

SECTION 07 13 00 - SHEET WATERPROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sheet membrane waterproofing.
- B. Cant strips and other accessories.
- C. Drainage panels.

1.2 REFERENCE STANDARDS

- A. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension; 2006a.
- B. ASTM D570 Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).
- C. ASTM E96/E96M Standard Test Methods For Water Vapor Transmission of Materials; 2010.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for membrane.
- C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- D. Certificate: Certify that products meet or exceed specified requirements.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- 1.4 QUALITY ASSURANCE
 - A. Membrane Manufacturer Qualifications: Company specializing in waterproofing sheet membranes with three years experience.
 - B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

1.6 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
- C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water , except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Carlisle Coatings & Waterproofing Inc.; Product CCW MiraDRI 860/861.

- B. Other Acceptable Laminated Composite Manufacturers:
 - 1. Grace Construction Products; Product Bituthene 3000: www.na.graceconstruction.com.
 - 2. Henry Company; Blueskin WP 200.
 - 3. W.R. Meadows; MEL-ROL.

2.2 APPLICATIONS

- A. Waterproof for building surfaces:
 - 1. Exterior face of foundation/building walls where finished grade is above finished floor elevation; waterproofing installed from top of footing to finished grade elevation.
 - 2. Concealed vertical face of separation of stepped floor elevations.

2.3 MEMBRANE MATERIALS

- A. Composite Laminate Membrane: Comprised of 56 mils thickness of rubberized asphalt and a 4 mils thickness of polyethylene film with release liner on adhesive-side; 60 mils total thickness.
 - 1. Tensile Strength: 325 psi, measured in accordance with ASTM D 412.
 - 2. Water Absorption: 231 percent increase in weight, maximum, measured in accordance with ASTM D 570, 24 hour immersion.
 - 3. Water Vapor Permeability: 0.05 perm inch, measured in accordance with ASTM E 96/E 96M.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Membrane Sealant: As recommended by membrane manufacturer.
- D. Termination Bars: Aluminum; compatible with membrane and adhesives.

2.4 ACCESSORIES

- A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Manufactured composite subsurface drainage panels consisting of a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to one side with a polymeric film bonded to the other side of a studded, nonbiodegradable, molded-plastic-sheet drainage core, with a vertical flow rate of 9 to 15 gpm per ft.
- B. Cant Strips: Premolded composition material.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
- C. Verify that items that penetrate surfaces to receive waterproofing are securely installed.

3.2 PREPARATION

- A. Protect adjacent surfaces not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions. Vacuum substrate clean.
- C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
- D. Seal cracks and joints with sealant using depth to width ratio as recommended by sealant manufacturer.

E. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer. Protect conditioner from rain or frost until dry.

3.3 INSTALLATION - MEMBRANE

- A. Install membrane waterproofing in accordance with manufacturer's instructions.
- B. Roll out membrane. Minimize wrinkles and bubbles.
- C. Self-Adhering Membrane: Remove release paper layer. Roll out on substrate with a mechanical roller to encourage full contact bond.
- D. Overlap edges and ends and seal by method recommended by manufacturer, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
- F. Weather lap joints on sloped substrate in direction of drainage. Seal joints and seams.
- G. Install flexible flashings. Seal items penetrating through membrane with flexible flashings. Seal watertight to membrane.
- H. Seal membrane and flashings to adjoining surfaces. Install termination bar at all edges. Install counterflashing over all exposed edges.

3.4 INSTALLATION - DRAINAGE PANEL

A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.

SECTION 07 16 16 - CRYSTALLINE WATERPROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Crystalline waterproofing.
- 1.2 REFERENCE STANDARDS
 - A. COE CRD-C 48 Standard Test Method for Water Permeability of Concrete; 1992.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Test data showing hydraulic permeability.
 - 2. Details for waterproofing at joints, intersections, and other special conditions.
- B. Specimen warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacture of products of the type specified and providing technical representatives to visit project site.
- B. Installer Qualifications: Acceptable to manufacturer, with documented experience on at least 5 projects of similar nature within the last 5 years.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Take necessary precautions to keep cementitious materials dry.
- 1.6 FIELD CONDITIONS
 - A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.7 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Provide installer's warranty agreeing to correct leaking waterproofing for 2 years from the Date of Substantial Completion, unless leakage is caused by structural failure, movement of the structure, or other causes beyond the installer's control.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Crystalline Waterproofing:
 - 1. Anti-Hydro International, Inc.; Hydro Cap.
 - 2. Conproco Corp.; Super Seal.
 - 3. Tamms Industries, Inc.; Hey'Di K-11.
 - 4. ThoRoc, Div. of ChemRex; Tegraproof.
 - 5. Tremco Incorporated; Permaquik Crystalline Waterproofing.
 - 6. Xypex Chemical Corporation; Xypex.

2.2 APPLICATIONS

- A. Waterproofing for building surfaces:
 - 1. Inside of elevator pits.

2.3 MATERIALS

- A. Crystalline Waterproofing: Portland cement and chemical compound that when applied to the surface of concrete forms insoluble crystals in the capillary pores preventing the passage of liquids, while having no adverse effect on the normal properties of concrete.
 - 1. Hydraulic Permeability: No measurable leakage or water flow at 200 psi pressure when tested in accordance with COE CRD-C 48, using minimum 2 inch thick sample and 20 days duration.
 - 2. Toxicity: Non-toxic.
 - 3. Color: Gray.
- B. Patching Compound: Ready-mixed cementitious mortar recommended or approved by waterproofing manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. Use sand blasting, water blasting, or acid etching as recommended.
- C. Plug water leaks.
- D. Patch holes, construction joints, and cracks. Remove defective concrete.
- E. Obtain approval of manufacturer's field representative before beginning installation.

3.2 INSTALLATION

- A. Install in strict accordance with manufacturer's instructions. Maintain environmental conditions required and recommended by manufacturer. Keep a copy of manufacturer's instructions on site.
- B. Coordinate installation with installation of products that must penetrate waterproofed surfaces.
- C. Prevent excessive drying of surface.
 - 1. Cure waterproofing for at least 3 days, or length of time required by manufacturer, with water spray and adequate air circulation.
 - 2. Do not use chemical curing agents unless explicitly approved by waterproofing manufacturer.
- D. Do not backfill, fill water or liquid holding structures, or apply finish coatings until time period recommended by manufacturer has passed.

SECTION 07 18 00 - TRAFFIC COATINGS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes traffic coatings for the interior exposed concrete floors.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. LEED Submittals: Provide documentation of VOC content in g/L for adhesives, sealants, primers and coatings applied within the building waterproofing envelope; comply with Section 01 61 16 VOC Restrictions.
- C. Shop Drawings: Show extent of each traffic coating. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions.
- D. Samples for Initial Selection: For each type of finish indicated.
- E. Qualification Data: For Installer.
- F. Material Test Reports: For each traffic coating.
- G. Material Certificates: For each traffic coating, signed by manufacturers.
- H. Field quality-control test reports.
- I. Maintenance Data: For traffic coatings to include in maintenance manuals. Identify substrates and types of traffic coatings applied. Include recommendations for periodic inspections, cleaning, care, maintenance, and repair of traffic coatings.
- J. Warranty: Special warranty specified in this Section.

1.3 PERFORMANCE REQUIREMENTS

A. Base Membrane: VOC compliant, high adhesion, liquid polyurethane membrane and shall meet or exceed the following typical performance properties:

	Property	Typical Value	ASTM Method
1.	Composition	Aromatic Urethane	
2.	Solids by Weight	85%	C 1250
3.	Hardness, Shore A	63	D 2240
4.	Tensile Strength	850 PSI	D 412
5.	Ultimate Elongation	625%	D 412
6.	Tear Resistance	140 lb/in	D 624
7.	Adhesion to Concrete	23 PLI	D 903
8.	Low Temp. Flexibility	-650F	D 522

B. Traffic-Resistant Top Coat: VOC compliant, high tensile strength, abrasion-resistant and weather-resistant aliphatic elastomeric polyurethane and shall meet or exceed the following typical performance properties:

	Property	Typical Value	ASTM Method
1.	Composition	Aliphatic Urethane	
2.	Solids by Weight	72%	C 1250
3.	Hardness, Shore A	91	D 2240
4.	Tensile Strength	3200 PSI	D 412
5.	Ultimate Elongation	190%	D 412
6.	Tear Resistance, Die C	300 lb/in.	D 624

7.	Low Temp. Flexibility	Pass	C 957
	And Crack Bridging		
8.	Weather Resistance	No Chalking at 2000 hrs.	G 53
9.	Water Permeability (system)	< 1.0 Perm	E 96 B
10.	Abrasion Resistance (system)	< 50 mg.	C 501

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of traffic coatings required for this Project.
- B. Source Limitations:
 - 1. Obtain traffic coatings from a single manufacturer.
 - 2. Obtain primary traffic coating materials, including primers, from traffic coating manufacturer. Obtain secondary materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of type and from source recommended in writing by primary material manufacturer.
- C. Preinstallation Conference:
 - 1. Before installing traffic coatings, meet with representatives of authorities having jurisdiction, manufacturer's technical representative, Owner, Architect, consultants, independent testing agency, and other concerned entities. Review requirements for traffic coatings. Notify participants at least seven days before conference.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels showing the following information:
 - 1. Manufacturer's brand name.
 - 2. Type of material.
 - 3. Directions for storage.
 - 4. Date of manufacture and shelf life.
 - 5. Lot or batch number.
 - 6. Mixing and application instructions.
 - 7. Color.
- B. Store materials in a clean, dry location protected from exposure to direct sunlight. In storage areas, maintain environmental conditions within range recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40 deg F, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
- B. Do not install traffic coating until items that will penetrate membrane have been installed.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which traffic coating manufacturer agrees to repair or replace traffic coatings that deteriorate during the specified warranty period. Warranty does not include deterioration or failure of traffic coating due to unusual phenomena, failure of prepared and treated substrate, formation of new substrate cracks exceeding 1/16 inch in width, fire, vandalism, or abuse by maintenance equipment.

- 1. Deterioration of traffic coatings includes the following:
 - a. Adhesive or cohesive failures.
 - b. Abrasion or tearing failures.
 - c. Surface crazing or spalling.
 - d. Intrusion of water, oils, gasoline, grease, or acids into deck substrate.
- 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Traffic Coatings: Complying with ASTM C 957.
- B. Material Compatibility: Provide primers; base, intermediate, and topcoats; and miscellaneous materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Emissions: Comply with low-emitting requirements in Section 016116 for primer, adhesive, sealant, traffic coating.

2.2 TRAFFIC COATING

- A. Basis-of-Design: Tremco Incorporated, Sealant/Waterproofing Division; Vulkem 350NF/951NF.
- B. Other Available Manufacturers: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Karnak Corporation.
 - 2. Carlisle Coatings and Waterproofing, Inc.
 - 3. Neogard.
 - 4. BASF.
 - 5. Polycoat Products, A Division of American Polymers Corp.
- C. Primer: Manufacturer's standard factory-formulated primer recommended for substrate and conditions indicated.
 - 1. Material: Urethane.
- D. Preparatory and Base Coats: Single- or multicomponent, aromatic liquid urethane elastomer.
- E. Topcoat: Single- or multicomponent, aliphatic liquid urethane elastomer.
 - 1. Color: As selected by Architect from manufacturer's full range.
- F. Component Coat Thicknesses: As recommended by manufacturer for substrate and service conditions indicated, but not less than the following (measured excluding aggregate):
 - 1. Base Coat: 32 mils minimum wet film thickness.
 - 2. Top Coat: 16 mils minimum wet film thickness.
- G. Aggregate: Uniformly graded, washed silica sand of particle sizes, shape, and minimum hardness recommended in writing by traffic coating manufacturer.
 - 1. Spreading Rate: As recommended by manufacturer for substrate and service conditions indicated, but not less than the following:
 - a. Top Coat: 8 to 10 lb/100 sq. ft., follow with backroll to encapsulate the sand.

2.3 MISCELLANEOUS MATERIALS

- A. Joint Sealants: As specified in Division 7 Section "Joint Sealants."
- B. Sheet Flashing: Nonstaining.

- 1. Minimum Thickness: 60 mils thickness.
- 2. Material: Sheet material recommended in writing by traffic coating manufacturer.
- C. Adhesive: Contact adhesive recommended in writing by traffic coating manufacturer.
- D. Reinforcing Strip: Fiberglass mesh recommended in writing by traffic coating manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements and for other conditions affecting performance of traffic coatings.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify compatibility with and suitability of substrates.
 - 3. Begin coating application only after minimum concrete curing and drying period recommended by traffic coating manufacturer has passed, after unsatisfactory conditions have been corrected, and after surfaces are dry.
 - 4. Verify that substrates are visibly dry and free of moisture.
 - a. Test for moisture vapor transmission by plastic sheet method according to ASTM D 4263.
 - b. Test for moisture content by method recommended in writing by manufacturer.
 - 5. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Clean and prepare substrates according to ASTM C 1127 and manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.
- B. Mask adjoining surfaces not receiving traffic coatings, deck drains, and other deck substrate penetrations to prevent spillage, leaking, and migration of coatings.
- C. Concrete Substrates: Mechanically abrade concrete surfaces to a uniform profile according to ASTM D 4259. Do not acid etch.
 - 1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
 - 2. Remove concrete fins, ridges, and other projections.
 - 3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
 - 4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.

3.3 TERMINATIONS AND PENETRATIONS

- A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C 1127 and manufacturer's written recommendations.
- B. Provide sealant cants at penetrations and at reinforced and nonreinforced, deck-to-wall butt joints.
- C. Terminate edges of deck-to-deck expansion joints with preparatory base-coat strip.
- D. Install sheet flashings at deck-to-wall expansion and dynamic joints, and bond to deck and wall substrates according to manufacturer's written recommendations.

3.4 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C 1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.
 - 1. Comply with recommendations in ASTM C 1193 for joint-sealant installation.

3.5 TRAFFIC COATING APPLICATION

- A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendations.
 - 1. Start traffic coating application in presence of manufacturer's technical representative.
 - 2. Verify that wet film thickness of each component coat complies with requirements every 100 sq. ft.
- B. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated, and omit aggregate on vertical surfaces.
- C. Cure traffic coatings according to manufacturer's written recommendations. Prevent contamination and damage during application and curing stages.

3.6 FIELD QUALITY CONTROL

- A. Testing: Engage a qualified testing agency to perform the following field tests and inspections and prepare test reports:
 - 1. Testing agency shall verify thickness of coatings during traffic coating application.
 - 2. If test results show traffic coating materials do not comply with requirements, prepare surfaces and reapply traffic coatings.
- B. Final Traffic Coating Inspection: Arrange for traffic coating manufacturer's technical personnel to inspect membrane installation on completion.
 - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.7 PROTECTING AND CLEANING

- A. Protect traffic coatings from damage and wear during remainder of construction period.
- B. Clean spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

SECTION 07 21 00 - THERMAL INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Board insulation at cavity wall construction, perimeter foundation wall, and at cavity wall construction where detailed.
- B. Batt insulation and vapor retarder in exterior wall construction.
- C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.2 REFERENCE STANDARDS

 A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01354, Section 01355, Section 01356 and appropriate forms, and Section 01600.
- E. LEED Submittal: Provide documentation indicating VOC content in g/L for adhesives applied within the building waterproofing envelope as specified in Section 01616.

1.4 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

- 2.1 APPLICATIONS
 - A. Insulation at Perimeter of Foundation: Extruded polystyrene board.
 - B. Insulation Inside Masonry Cavity Walls, where detailed: Extruded polystyrene board.
 - C. Insulation in Metal Framed Walls: Batt insulation with separate vapor retarder.

2.2 GENERAL

- A. Adhesive installed within the waterproofing envelope: Comply with low-emitting requirements as specified in Section 01616.
- B. Recycled Content: Provide insulation with the highest recycled content feasible.
- C. Regional Materials: Give preference to insulation manufactured and of primary raw materials extracted or recovered within 500 mile radius of project site.

2.3 FOAM BOARD INSULATION MATERIALS

- A. Extruded Polystyrene Board Insulation: ASTM C 578, Type X and Type VI; Extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
 - 1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 - 3. Board Edges: Square.
 - 4. Thermal Conductivity (k factor) at 25 degrees F: 0.18.
 - 5. Compressive Resistance: 15 psi at vertical applications; 40 psi at foundation perimeter.
 - 6. Board Density: 1.3 lb/cu ft.
 - 7. Water Absorption, maximum: 0.3 percent, volume.
 - 8. Manufacturers:
 - a. Dow Chemical Co: www.dow.com.
 - b. Owens Corning Corp: www.owenscorning.com.
 - c. Pactiv Building Products: greenguard.pactiv.com.
- B. Adhesive: Provide letters from the insulation manufacturer and vapor retarder manufacturer confirming compatibility of adhesive recommended by insulation manufacturer for applying cavity insulation.

2.4 BATT INSULATION MATERIALS

- A. Batt Insulation: ASTM C 665; preformed batt; friction fit, conforming to the following:
 - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E 84.
 - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
 - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E 136, except for facing, if any.
 - 4. Facing: Aluminum foil, flame spread 25 rated; one side.
 - 5. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com.
 - b. Johns Manville Corporation: www.jm.com.
 - c. Knauf Insulation: www.knaufusa.com
 - d. Owens Corning Corp: www.owenscorning.com.
- B. Unfaced Batt Insulation: ASTM C 665, Type I.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation .
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Apply adhesive to back of boards:
 - 1. Three continuous beads per board length.
- B. Install boards horizontally on foundation perimeter.
 - 1. Place boards to maximize adhesive contact.
 - 2. Install in running bond pattern.

- 3. Butt edges and ends tightly to adjacent boards and to protrusions.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.3 BOARD INSTALLATION AT CAVITY WALLS

- A. Adhere over outer face of block backup.
- B. Apply the insulating board to the outer surface of the inner masonry wythe with sufficient manual pressure to assure tight joint and good contact.
- C. Locations: At exterior cavity masonry walls and lining concrete block backup, around the building, as detailed or scheduled.
- D. 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.
- E. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.
- F. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.4 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Install with factory applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
- F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- G. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.
- H. Tape seal tears or cuts in vapor retarder.
- I. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.

SECTION 07 21 27 - ENCLOSED CAVITY FOAMED INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Foamed-in-place insulation in masonry cavity walls.
- B. Transition Membranes.
- C. Flexible Flashing.

1.2 REFERENCES

- A. ASTM C 177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- B. ASTM D 1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- C. ASTM D 1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
- D. ASTM D 2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics.
- E. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.
- G. ASTM E 2357 Standard for Air Barrier Materials.
- H. NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale, Multistory test Apparatus.

1.3 SUBMITTALS

- A. Product Data: Provide product description, insulation properties, and preparation requirements.
- B. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
- C. ICC-ES Evaluation Report to establish code compliance and R-Value.
- D. Submit proof of compliance with NFPA 285 for Masonry as well as Rain Screen wall assemblies if applicable.
- E. Submit certification of ASTM E-2357 compliance.
- F. Submit proof of ABAA- Assembly Testing and Letter from Manufacturer stating SPF contractor in Approved to install Air Barrier SPF Product.
- G. LEED Submittal: Provide documentation indicating VOC content in g/L for adhesives and primers applied within the building waterproofing envelope; as specified in Section 01 61 16.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than five years of documented experience.
- B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum three years of experience.
- C. Contractor shall be certified by ABAA for SPF air barrier systems. Contractor shall include ABAA inspection and reports, submitted to Architect at each stage.

D. Contractor shall provide a written Safety Program, written Respirator Program and a written Job Hazard Analysis.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke limitations.
- 1.6 MOCK-UP
 - A. Include within mock-up for masonry assemblies.
- 1.7 PRE-INSTALLATION MEETING
 - A. Convene prior to mock-up and three weeks prior to commencing Work of this section. Review non-standard details, unusual conditions, and quality control procedures for this project.
 - 1. The following be in addendance: SPF Contractor, General Contractor, Sheathing and or Masonry Contractors, Owner's representative and Architect.

1.8 FIELD CONDITIONS

A. Do not install insulation when ambient temperature is lower than 40 degrees F.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Permax 2.0 by Henry Company.
 - B. Ecobay CC by Bayer Materials Sciences.
 - C. Walltite by BASF; www.basf-pfe.com.
 - D. Corobond III by Johns Manville Company.

2.2 MATERIALS

- A. Insulation: Polyurethane type.
 - 1. Thermal Conductivity: When tested in accordance with ASTM C 518:
 - 2. Water Vapor Transmission: 1.82 perms (1 inch SPF), measured in accordance with ASTM E 96.
 - 3. Air Permeance: 0.000025 L/s/sq. m. at 75 Pa, when tested in accordance with ASTM E 2178.
 - 4. Compressive Strength: 22 psi, when tested in accordance with ASTM D 1621.
 - 5. Density: 2.0 lb/cu ft, when tested in accordance with ASTM D 1622.
 - 6. Surface Burning Characteristics: Flame spread/Smoke developed index of 25 / 350, when tested in accordance with ASTM E 84 (4 inches SPF thickness).
 - 7. R-Value: Minimum of R-16.75.
 - 8. Thickness: 2 1/2 inches.
 - a. Variation from thickness will be no more than plus 1/2 inch and no less than minus 1/4 inch.
- B. Adhesives, primers applied within the building waterproofing envelope: Comply withlow-emitting requirements in Section 01 61 16.
- C. Flexible Flashing: For flashing not exposed to the exterior, use the following, unless otherwise indicated:
 - 1. Product:
 - a. Basis-of-Design: Mighty-Flash-SA Self Adhering Stainless Steel Fabric Flashing by Hohmann & Barnard, Inc.

- 2. Primer: Manufacturers standard product recommended for the application.
- 3. Performance Requirements:
 - a. Tensile Strength: ASTM D412 Die; 100,000.
 - b. Puncture Resistance: ASTM E154; minimum 2,500 psi.
 - c. Membrane Thickness: .004 in.
 - d. Stainless Steel Thickness: .003 in.
 - e. Stainless Steel Type: Type 304.
- 4. Accessories (Basis-of-Design):
 - a. Type T1 Termination Bar by Hohmann & Barnard.
 - b. Splice Tape; X-Seal by Hohmann & Barnard
- 2.3 ACCESSORIES
 - A. Primer: As required by insulation manufacturer.
 - B. Transition Membrane Compatible with the insulation manufacturer and in locations as detailed in the drawings and at the following:
 - 1. Grade from face of wall, overlap below grade membrane where applicable.
 - 2. Parapet from outside face of wall, over top of parapet and under roof membrane.
 - 3. Dissimilar materials.
 - 4. Masonry control joints.
 - 5. Head, jamb, and sills of windows, doors, and other wall openings.
 - 6. Basis-of-Design Product: Blueskin SA, Manufactured by Henry.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify work within construction spaces or crevices is complete prior to insulation application.
- B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.2 PREPARATION

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.
- C. Provide transition membranes between dissimilar materials all instances.

3.3 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.
- B. Apply insulation by spray method, to a uniform monolithic density without voids.
- C. Clear foam from masonry veneer anchors to permit free movement within full limit of tie slots.
- D. Patch damaged areas.

3.4 FIELD QUALITY CONTROL

- A. Field inspections and tests to be performed by an independent testing agency. Contractor is to coordinate with and provide full access to Work that the independent testing agency will be inspecting.
- B. Inspection will include verification of insulation and overcoat thickness and density.

SECTION 07 26 19 - TOPICAL MOISTURE VAPOR MITIGATION SYSTEM

PART 1 - GENERAL

- 1.1 SUMMARY
 - A. This Section includes a single-coat, fast-curing, 100% solids epoxy moisture management system formulated to suppress excessive moisture vapor emissions.
 - 1. Location: To be used at all new concrete floor slabs within the building.
 - 2. Related Sections include the following:
 - a. Section 03 30 00, Cast-In-Place Concrete
 - b. Division 09 Flooring Sections
- 1.2 REFERENCES
 - A. ASTM F2170 Relative Humidity in Concrete Floor Slabs Using in situ Probes
 - B. ASTM F1869 Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
 - C. ASTM 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - D. ASTM C1583 Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension
 - E. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials
 - F. ASTM D1308 Chemical Resistance of Finishes
- 1.3 SUBMITTALS
 - A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
 - B. Qualification Data: For Installer, indicating certification by the manufacturer of the moisture mitigation product.
- 1.4 QUALITY ASSURANCE
 - A. Installation of the product must be completed by a factory trained applicator, using mixing equipment and tools approved by the manufacturer.
 - B. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of work for not less than 5 years. Contact Manufacturer Representative prior to installation.
- 1.5 WARRANTY
 - A. Certified applicator must file a pre-installation checklist with the manufacturer and receive written confirmation of the approval to proceed.
 - 1. Warranty Period: 10 years from date of substantial completion.
- 1.6 DELIVERY, STORAGE AND HANDLING
 - A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.
 - B. Store products in a dry area with temperature maintained between 50° and 85° F (10° and 29°
 - C. C) and protect from direct sunlight.
 - D. Handle products in accordance with manufacturer's printed recommendations.

1.7 PROJECT CONDITIONS

A. Do not install material below 50° F (10° C) surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
 - A. UZIN.
 - B. ARDEX.
 - C. Floor Seal.
 - D. Mapei.

2.2 TOPICAL MOISTURE VAPOR EMISSION SYSTEM

- A. One-Coat Moisture Control System for Concrete:
 - 1. Representative Product: ARDEX MC RAPID; Manufactured by ARDEX Engineered Cements.
 - 2. Performance and Physical Properties: Meet or exceed the following values for material cured at 70° F+/-3°F (21° C+/-3°C) and 50% +/-5% relative humidity:
 - a. Application: Manual
 - b. Material Requirements on CSP 3 Prepared Concrete: Max 270 sq. ft. per mixed unit for 10 mils
 - c. Permeability (ASTM E96): =0.06 perms
 - d. 14 pH solution (ASTM D1308): No effect
 - e. Working Time: 20 minutes
 - f. Pot Life: 20 minutes
 - g. VOC: 0g/L, calculated SCAQMD 1113
 - h. Walkable: Minimum of 4 hours
 - i. Prime and Install Underlayment: Minimum 4 hours, maximum 24 hours

2.3 HYDRAULIC CEMENT UNDERLAYMENT

- A. Hydraulic Cement-based Self-Leveling Underlayment.
 - 1. Representative Product: ARDEX K 60; Manufactured by ARDEX Engineered Cements.
 - a. Primer: ARDEX P 82 Ultra Prime; required if moisture control system was left exposed for more than 4 hours.
 - 2. Performance and Physical Properties: Meet or exceed the following values for material cured at 70° F+/-3°F (21° C+/-3°C) and 50% +/-5% relative humidity:
 - a. Application: Barrel Mix or Pump
 - b. Flow Time: 10 minutes
 - c. Initial Set: Approx. 30 minutes
 - d. Final Set: Approx. 90 minutes
 - e. Compressive Strength: Minimum 4100 psi at 28 days, ASTM C109M.
 - f. Flexural Strength: 1000 psi at 28 days, ASTM C78.
 - g. VOC: 0 g/l, calculated SCAQMD 1113

2.4 WATER: Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).

PART 3 – EXECUTION

- 3.1 PREPARATION
 - A. Concrete Subfloors: Prepare substrate in accordance with manufacturer's instructions.
 - 1. Prior to proceeding please refer to ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker before application.
 - 2. Mechanical preparation of the surface is required to obtain a minimum ICRI concrete surface profile of 3 (CSP 3). This substrate preparation must be by mechanical means, such as shot blasting.
 - 3. The concrete must have a minimum tensile strength of at least 150 psi for areas to receive normal foot traffic, and 200 psi for area of heavy commercial traffic when tested in accordance with ASTM C1583. The concrete surface can be damp, but must be free of standing water.
 - 4. Prior to beginning the installation, measure the relative humidity within the concrete (ASTM F2170). Alternatively, you can also measure the surface relative humidity in accordance with ASTM F2420. For these relative humidity methods, the RH shall not exceed 100%. No standing water shall be present.
 - B. Joint Preparation
 - 1. Moving Joints honor all expansion and isolation joints up through the moisture mitigation system and underlayment. A flexible sealing compound compatible with moisture mitigation product may be installed.
 - 2. Saw Cuts and Control Joints fill all non-moving joints with manufacturer approved joint filler.

3.2 APPLICATION

- A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.
- B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.
- C. Mixing: Comply with manufacturer's printed instructions.
- D. Application: Comply with manufacturer's printed instructions and the following.
 - 1. Apply the first coat of moisture mitigation product to the prepared concrete surface in a uniform direction at the recommended application rate to achieve a coating thickness of 10 mils minimun. Use a short-nap paint roller or notched squeegee for smoother surfaces, and a longer nap roller for more uneven substrates. To minimize the potential for pinhole formation, work the material into the surface with the roller to ensure maximum penetration. A paintbrush can be used for hard to reach areas and corners.
 - 2. For Underlayment applications, prime the surface of the moisture mitigation product if required by manufacturer. Allow the primer to dry thoroughly before installing the underlayment.
- E. PROTECTION

1. Prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

SECTION 07 26 70 - MECHANICALLY-ATTACHED AIR AND MOISTURE BARRIER

PART 1 GENERAL

1.1 SUMMARY

A. Section includes air leakage criteria for primary air seal building enclosure materials and assemblies; and air seal materials to connect and seal openings, joints, and junctions between other air seal materials and assemblies.

1.2 DEFINITIONS

A. Air Barrier: Continuous network of materials and joints providing air tightness, with adequate strength and stiffness to not deflect excessively under air pressure differences, to which it will be subjected in service. It can be comprised of single material or combination of materials to achieve performance requirements.

1.3 PERFORMANCE REQUIREMENTS

- A. Air Penetration: Meeting requirements for Type 1 per ASTM E1677.
- B. Water Vapor Transmission: 50 grams per meter square per day or 10 perms, or better, tested in accordance with ASTM E96, Method A or B, or ASTM F1249.
- C. Tensile Strength: Minimum 27/24 lbs/in tested in accordance with ASTM D882, Method A.
- D. Tear Resistance: Minimum 12/10 lbs. tested.
- E. Allowable UV Exposure Time: Not less than three months.
- F. Surface Burning Characteristics: Class A per ASTM E84.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate special joint conditions and sealing applicable penetrations.
- B. Product Data: Submit data on material characteristics and performance criteria, indicating compliance with requirements.
- C. Manufacturer's Installation Instructions: Submit preparation, installation requirements and techniques, product storage and handling criteria.
- D. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative in the direct employ of the manufacturer, indicating observation of air barrier assembly installation.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Provide commercial air barrier and accessory materials produced by single manufacturer.
- B. Pre-installation Meeting:
 - 1. Hold a pre-installation conference, two weeks prior to start of air barrier installation. Attendees shall include Contractor, Architect, Installer, and Air Barrier Manufacturer's Designated Representative.
 - 2. Review all related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of air barrier assembly materials and components, installer's training requirements, equipment, facilities and scaffolding, and coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection.

1.6 MOCKUP

- A. Construct mock-up of air barrier system, within Project's exterior wall mockup required by other sections.
- 1.7 SEQUENCING
 - A. Sequence Work to permit installation of materials in conjunction with related materials and seals.

PART 2 PRODUCTS

2.1 AIR BARRIERS

- A. Air Barrier Manufacturers:
 - 1. Dupont Tyvek CommercialWrap.
 - 2. WrapShield by VaproShield LLC.
 - 3. Metro Wrap by Typar.
- B. Accessory Manufacturers:
 - 1. Quickflash Weatherproofing Products, Inc.

2.2 COMPONENTS

- A. Sheet: Product listed with manufacturer.
- B. Tape: Self adhering type; mesh reinforced and compatible with sheet material.
 - 1. Provide standard tape of sheet manufacturer.
- C. Fasteners: As manufactured or accepted by sheet manufactuer.
 - 1. Cap screws for cold formed metal frame construction; 2-inch cap or washer.
 - 2. #4 nails with large 1-inch plastic cap fasteners for wood frame construction.
- D. Sealants: Provide sealants complying with ASTM C920, elastomeric polymer sealant to maintain watertight conditions.
- E. Primers: Provide manufacturer recommended primer to improve adhesion between substrate and flashing materials.
- F. Flashing: Flexible flashing material for openings penetration; dual-sided membrane materials for brick mold and non-flanged windows and doors.
- G. Accessories:
 - 1. Prefabricated accessories for penetration.
 - 2. Provide the appropriate flashing panel by Quickflash Weatherproofing Products, Inc., for all plumbing, gas, mechanical and electrical penetration.
 - a. Flashing panels for A/C line sets (Model A/C 150 C or Model A/C 250 C) to be field painted to match adjacent materials.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean and prime substrate surfaces to receive adhesive and sealants.

3.2 INSTALLATION

A. Install air barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations.

- B. Install air barrier prior to installation of windows and doors.
- C. Start air barrier installation at a building corner, leaving 6-12 inches of air barrier extended beyond corner to overlap.
- D. Install air barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers.
- E. Maintain air barrier plumb and level.
- F. Sill Plate Interface: Extend lower edge of air barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by air barrier manufacturer.
- G. Window and Door Openings: Extend air barrier completely over openings.
- H. Overlap air barrier.
 - 1. Exterior corners: Minimum 12 inches.
 - 2. Seams: minimum 6 inches.
- I. Penetrations:
 - 1. Install prefabricated flashing panels as directed by manufacturer.
 - 2. Place air barrier up behind bottom of flashing panel to bottom of protrusion.
 - 3. Place subsequent layer of air barrier over top of flashing panel to bottom front edge or further down; tape seal bottom edge full length to underlying sheet and tape seal cut edges to flashing panel.
- J. Air Barrier Attachment:
 - 1. Attach air barrier to cold-formed metal studs through exterior sheathing.
 - 2. Secure using air barrier manufacturer recommended fasteners, space 12 -18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.
- K. Apply 4 inch by 7 inch piece of self-adhering flashing to air barrier membrane prior to the installation cladding anchors.
- 3.3 SEAMING
 - A. Seal seams of air barrier with seam tape at all vertical and horizontal overlapping seams.
 - B. Seal any tears or cuts as recommended by air barrier manufacturer.
- 3.4 OPENING PREPARATION NON-FLANGED OPENING FRAMES
 - A. Flush cut air barrier at edge of sheathing around full perimeter of opening.
 - B. Cut a head flap at 45-degree angle in the air barrier at window head to expose 8 inches of sheathing. Temporarily secure air barrier flap away from sheathing with tape.

3.5 FLASHING - NON-FLANGED OPENING FRAMES

- A. Cut self-adhering flashing a minimum of 12 inches longer than width of sill rough opening; apply primer as required by manufacturer.
 - 1. Provide 7-inch wide flashing for 2 by 4 framing.
 - 2. Provide 9-inch wide flashing for 2 by 6 framing.
- B. Cover horizontal sill by aligning self-adhering flashing edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
- C. Fan self-adhering flashing at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.

- D. Apply 9-inch wide strips of self-adhering flashing at jambs. Align flashing with interior edge of jamb framing. Start self-adhering flashing at head of opening and lap sill flashing down to the sill.
- E. Spray-apply primer to top 6 inches of jambs and exposed sheathing.
- F. Install self-adhering flashing at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.
- G. Coordinate flashing with window installation.
- H. On exterior, install backer-rod in joint between window frame and flashed rough framing. Apply sealant at jambs and head, leaving sill unsealed. Apply sealants in accordance with sealant manufacturer's instructions and ASTM C 1193.
- I. Position air barrier head flap across head flashing. Adhere using 4-inch wide self-adhering flashing over the 45-degree seams.
- J. Tape top of window in accordance with manufacturer recommendations.
- K. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

3.6 OPENING PREPARATION - FLANGED OPENING FRAMES

- A. Cut air barrier in a modified "I-cut" pattern.
 - 1. Cut air barrier horizontally along the bottom of the header.
 - 2. Cut air barrier vertically 2/3 of the way down from top center of window opening.
 - 3. Cut air barrier diagonally from bottom of center vertical cut to the left and right corners of the opening.
 - 4. Fold side and bottom air barrier flaps into window opening and fasten.
- B. Cut a head flap at 45-degree angle in the air barrier at window head to expose 8 inches of sheathing. Temporarily secure air barrier flap away from sheathing with tape.
- 3.7 FLASHING FLANGED OPENING FRAMES
 - A. Cut self-adhering flashing a minimum of 12 inches longer than width of sill rough opening.
 - 1. Provide 7-inch wide flashing for 2 by 4 framing.
 - 2. Provide 9-inch wide flashing for 2 by 6 framing.
 - B. Cover horizontal sill by aligning self-adhering flashing edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
 - C. Fan self-adhering flashing at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges
 - D. On exterior, apply continuous bead of sealant to wall or backside of window mounting flange across jambs and head. Do not apply sealant across sill.
 - E. Install window according to manufacturer's instructions.
 - F. Apply 4-inch wide strips of self-adhering flashing at jambs overlapping entire mounting flange. Extend jamb flashing 1-inch above top of rough opening and below bottom edge of sill flashing.
 - G. Apply 4-inch wide strip of self-adhering flashing as head flashing overlapping the mounting flange. Head flashing should extend beyond outside edges of both jamb flashings.

- H. Position air barrier head flap across head flashing. Adhere using 4-inch wide self-adhering flashing over the 45-degree seams.
- I. Tape head flap in accordance with manufacturer recommendations.
- J. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.
- 3.8 FIELD QUALITY CONTROL
 - A. Notify manufacturer's designated representative to obtain periodic observations of air barrier assembly installation.

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Do not permit adjacent work to damage work of this Section.

SECTION 07 42 13 - METAL WALL PANELS

PART 1 GENERAL

1.1 SUMMARY

A. Factory-formed and field-assembled, concealed-fastener, lap-seam, profiled metal wall panels.

1.2 **DEFINITION**

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight system.
- B. Steel Sheet Thickness: Minimum thickness of base metal without metallic coatings or painted finishes.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide metal wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at a static-air-pressure difference of 1.57 lbf/sq. ft.
- C. Water Penetration: No water penetration when tested according to ASTM E 331 at a minimum differential pressure of 20 percent of inward-acting, wind-load design pressure of not less than 6.24 lbf/sq. ft. and not more than 12 lbf/sq. ft.
- D. Horizontal joint design shall demonstrate pressure equalization in accordance with AAMA 508-07, which includes static and dynamic testing with imperfect air barriers; a third party test indicating successful passing of this test must be submitted.
 - 1. Panel systems that have not successfully passed AAMA 508-07 shall provide a backup system including a membrane that meets the air and water infiltration values as listed above.
- E. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592.
- F. Wind Loads: International Building Code 2009; Factory Mutual Global and ASCE 7.
- G. Deflection Limits: Engineer metal wall panel assemblies to withstand test pressures with deflection no greater than 1/180 of the span and no evidence of material failure, structural distress, or permanent deformation exceeding 0.2 percent of the clear span, unless Code requires greater requirements.
- H. Seismic Performance: International Building Code 2009; and comply with ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads.
- I. Thermal Movements: Provide metal wall panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal wall panel and accessory.
- B. LEED Report: Accurately document the use of recycled materials, as required by Section 01 81
 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
- C. Qualification Data: For installer, manufacturer and professional engineer; include 5 copies.
- D. Shop Drawings: Include required sets prepared by or under the supervision of a qualified professional engineer licensed in the State of Maryland, detailing fabrication and assembly of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory and field-assembled work.
 - 1. Accessories: Include details of the flashing and trim, at a scale of not less than 1-1/2 inches per 12 inches.
 - 2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 3. Engineer to be employed by the manufacturer and licensed in the State of Maryland.
- E. Coordination Drawings: Exterior elevations drawn to scale and coordinating penetrations and wall-mounted items. Show the following:
 - 1. Wall panels and attachments.
 - 2. Girts or framing.
 - 3. Wall-mounted items including doors, windows, louvers, and lighting fixtures.
- F. Samples for Verification:
 - 1. For each type of exposed finish required.
 - 2. Metal Wall Panels: Actual panel width; minimum 12 inch length. Include fasteners, closures, and other metal wall panel accessories.
- G. Qualification Data: For installer and Professional Engineer.
- H. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:
 - 1. Materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following:
 - 1. Metal Wall Panels: Include reports for air infiltration, water penetration, and structural performance.
- J. Maintenance Data: For metal wall panels to include in maintenance manuals.
- K. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Manufacturer Qualifications: Manufacturer capable of providing engineering and field service representation during construction and approving acceptable installer.
 - 1. Engineering Responsibility: Preparation of data for including the following:

- a. Shop Drawings and comprehensive engineering analysis by a qualified professional engineer licensed in the State of Maryland.
- 2. Company with a minimum of ten years of continuous experience manufacturing panel material of the type specified and capable of providing the following information.
- 3. List of five other projects of similar size, including approximate date of installation and name of Architect for each.
- C. Source Limitations: Obtain each type of metal wall panel through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal wall panels and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
 - 2. Submit no fewer than nine pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
- E. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects.
 - 1. Provide components for installation in mock-ups, as indicated in Section 04 20 00 and the Drawings.
 - 2. Approval of mockups is for other material and construction qualities specifically approved by Architect in writing.
 - 3. 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.
- F. Preconstruction Conference: Before starting wall framing, sheathing, or girt construction, conduct conference at Project site. Review methods and procedures related to wall construction and metal wall panels including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, metal wall panel Installer, metal wall panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal wall panels including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal wall panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
 - 6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 7. Review temporary protection requirements for metal wall panel assembly during and after installation.
 - 8. Review wall panel observation and repair procedures after metal wall panel installation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- B. Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal wall panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on metal wall panels from exposure to sunlight and high humidity, except to extent necessary for period of metal wall panel installation.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal wall panels to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication and indicate measurements on Shop Drawings.

1.8 COORDINATION

A. Coordinate metal wall panel assemblies with rain drainage work, flashing, trim, and construction of girts, studs, soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Five 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 wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755.
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation; structural quality; having recycled content.
 - 2. Surface: Smooth finish as standard for manufacturer and gage.
 - 3. Exposed Finishes:
 - a. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1) Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 4. Recycled Content: Provide steel 25 percent post-consumer recycled content.
- B. Panel Sealants:
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal wall panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.2 MISCELLANEOUS METAL FRAMING

- A. Steel Sheet Components, General: Complying with ASTM C 645 requirements for metal and with ASTM A 653, G60, hot-dip galvanized zinc coating and having recycled content.
- B. Subgirts: Fabricated from minimum 16 gage zinc coated steel conforming to ASTM A 653 SQ Grade 37, G90 coating.
- C. Zee Clips: 0.079-inch bare steel thickness, cold-formed, galvanized steel sheet.
- D. Base or Sill Channels: 0.079-inch bare steel thickness, cold-formed, galvanized steel sheet.
- E. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.
- F. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating.
 - 1. Fasteners for Wall Panels: 300 series stainless steel with 5/8-inch bonded neoprene or EPDM and stainless washers.
 - 2. Concealed fasteners to be cadmium plated carbon steel.

B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.4 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

- A. General: Provide factory-formed metal wall panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.
- B. Provide prefabricatd trimless ends/corner pieces at all inside and outside corners.
- C. Metal Panel Type MP-1: Uninsulated 1-1/2 inch in depth with 12 inches in coverage width; exterior surface to have a 12 inch flush plane.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide IW-10A by Centria or comparable product by one of the following:
 - a. Morin.
 - b. Atas.
 - 2. Laps (Horizontal End): MicroLine Extrusion.
 - 3. Material: Zinc-coated (galvanized) steel sheet, minimum 18 gage nominal thickness.
 - a. Exterior Facing Finish: 2-coat fluoropolymer.
 - 1) Color Match Centria's 971 Chromium Gray.
 - b. Interior Facing Finish: Manufacturer's standard siliconized polyester where unexposed; match exterior facing finish where exposed (equipment screen).
- D. Metal Panel Type MP-2: Uninsulated 1-1/2 inch in depth with 12 inches in coverage width; exterior surface to have two 6 inch planes.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide IW-20A by Centria or comparable product by one of the following:
 - a. Morin.
 - b. Atas.
 - 2. Laps (Horizontal End): MicroLine Extrusion.
 - 3. Material: Zinc-coated (galvanized) steel sheet, minimum 18 gage nominal thickness.
 - a. Exterior Facing Finish: 2-coat fluoropolymer.
 - 1) Color Custom to match Architect's sample.
 - b. Interior Facing Finish: Manufacturer's standard siliconized polyester where unexposed.
- E. Metal Panel Type MP-3: Uninsulated 1-1/2 inch in depth with 12 inches in coverage width; exterior surface to have an 11 inch projected face.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide IW-40A by Centria or comparable product by one of the following:
 - a. Morin.
 - b. Atas.
 - 2. Laps (Horizontal End): MicroLine Extrusion.
 - 3. Material: Zinc-coated (galvanized) steel sheet, minimum 18 gage nominal thickness.
 - a. Exterior Facing Finish: 2-coat fluoropolymer.
 - 1) Color Custom to match Architect's sample.
 - b. Interior Facing Finish: Manufacturer's standard siliconized polyester where unexposed; match exterior facing finish where exposed (equipment screen).

- F. Metal Panel Type MP-4: Uninsulated 7/8 inch in depth with 12 inches in coverage width; exterior surface to have a corugated face.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide CS-260E by Centria or comparable product by one of the following:
 - a. Morin.
 - b. Atas.
 - 2. End Laps: Extrusion.
 - 3. Material: Zinc-coated (galvanized) steel sheet, minimum 18 gage nominal thickness.
 - a. Exterior Facing Finish: 2-coat fluoropolymer.
 - 1) Color Match Centria's 971 Chromium Gray.
 - b. Interior Facing Finish: Manufacturer's standard siliconized polyester where unexposed; match exterior facing finish where exposed (equipment screen).
- G. Metal Panel Type MP-5: Uninsulated 7/8 inch in depth with 12 inches in coverage width; exterior surface to have a 12 inch flush plane.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide CS-260 by Centria or comparable product by one of the following:
 - a. Morin.
 - b. Atas.
 - 2. End Laps: Extrusion.
 - 3. Material: Zinc-coated (galvanized) steel sheet, minimum 18 gage nominal thickness.
 - a. Exterior Facing Finish: 2-coat fluoropolymer.
 - 1) Color Match Centria's 971 Chromium Gray.
 - b. Interior Facing Finish: Manufacturer's standard siliconized polyester where unexposed; match exterior facing finish where exposed (equipment screen).

2.5 ACCESSORIES

- A. Provide components required for a complete metal wall panel assembly including trim, copings, fascia, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.
 - 1. Trimless End Closures: Provide trimless metal panel closures at the ends of all insulated metal wall panels. On flat panels the metal closure will extend a minimum of one inch from the face of the panel. Metal panel closures will allow for trimless condition at vertical panel joints. Formed trims and extrusions will not be acceptable at vertical joint conditions.

2.6 FABRICATION

- A. General: Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, 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.
 - 1. Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.
 - 2. Fabricate wall panels with panel stiffeners as required to maintain fabrication tolerances and to withstand design loads.
- B. Provide factory-fabricated mitered corners; field cut and joined corners will not be accepted.
 - 1. Mitered corner assemblies shall match specified exterior profile panel in shape, general appearance, material and finish.

- 2. Mitered corner assemblies shall be factory coil coated to match adjacent panels; paint finish shall meet specified warranty requirements.
- C. Fabricate metal wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.
- D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 3. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal wall panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of work.
 - 1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 - 2. Examine solid wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
 - 3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
- B. Examine roughing-in for components and systems penetrating metal wall panels to verify actual locations of penetrations relative to seam locations of metal wall panels before metal wall panel installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Framing: Install subgirts, base angles, sills, furring, and other miscellaneous wall panel support members and anchorage according to ASTM C 754 and metal wall panel manufacturer's written recommendations.
- 3.3 METAL WALL PANEL INSTALLATION, GENERAL
 - A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

- 1. Commence metal wall panel installation and install minimum of 300 sq. ft. in presence of factory-authorized representative.
- 2. Field cutting of metal wall panels by torch is not permitted.
- 3. Shim or otherwise plumb substrates receiving metal wall panels.
- 4. Rigidly fasten base end of metal wall panels and allow eave end free movement due to thermal expansion and contraction.
- 5. Flash and seal metal wall panels with weather closures at eaves and at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until weather barrier and flashings that will be concealed by metal wall panels are installed.
- 6. Install screw fasteners in predrilled holes.
- 7. Locate and space fastenings in uniform vertical and horizontal alignment.
- 8. Install flashing and trim as metal wall panel work proceeds.
- 9. Provide panel splices with structural support behind each joint. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
- 10. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, as necessary for waterproofing.
- 11. Align bottom of metal wall panels and fasten with fasteners as recommended by the metal wall panel manufacturer. Fasten flashings and trim around openings and similar elements with fasteners as recommended by the metal wall panel manufacturer.
- 12. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- B. Fasteners: Stainless steel.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel manufacturer.
- D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal wall panel manufacturer.
 - 1. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealers."
 - 2. Seal noninsulated metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.

3.4 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. 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 will be permanently watertight and weather resistant.
 - 1. Install exposed flashing and trim 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.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal wall panel units within installed tolerance of 1/4 inch in 20 feet, nonaccumulative, on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

- A. Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Water-Spray Test: After completing the installation of 75-foot length by full height area of metal wall panel assembly, test assembly for water penetration according to AAMA 501.2.
- C. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect completed metal wall panel installation, including accessories. Report results in writing.
- D. Remove and replace applications of metal wall panels where inspections indicate that they do not comply with specified requirements.
- E. Additional tests and inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal wall panel installation, clean finished surfaces as recommended by metal wall panel manufacturer. Maintain in a clean condition during construction.
- B. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal wall panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 50 56 - 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 07 Section Hot Applied Built-Up Roofing for membrane roofing, roof insulation, and total roofing system warranty including warranty coverage for work of this Section.

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. Root barrier.
 - b. Technical seam tapes.
 - c. Protection sheet.
 - d. Horizontal insulation.
 - e. Drain inspection box.
 - f. Pre-vegetated modular tray.
 - g. Edging restraint.
 - h. Pre-cast concrete pavers.
 - i. Erosion control netting.
- 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 30 00 "Administrative Requirements".
- B. 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. Pre-cast concrete pavers.
 - 8. Erosion control netting.
- C. 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.
- D. Shop Drawings: For vegetated roof assemblies. Include roof plans, slopes, and drain locations; details of vegetated roof assemblies and accessories, walkway pavers.
 - 1. Indicate planted areas correlated with planting schedule.
- E. Samples for Verification: Two (2) samples for each of the following components of vegetated roof assembly:
 - 1. Root barrier: 12 inch x 12 inch.
 - 2. Protection sheet: 12 inch x 12 inch.
 - 3. Pre-vegetated modular tray: 15 inch x 20 inch.
 - 4. 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.
- F. LEED Report: Accurately document the use of recycled materials and location of harvest for plants, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.

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. Mock-Up: Build mock-ups to set quality standards for materials and executions.
 - 1. Build mock-up of vegetated roof assembly and associated components and accessories.
 - 2. Size: 100 sq. ft., 10 ft. x 10 ft. to demonstrate assembly installation and standard of workmanship.
 - 3. Subject to compliance with requirements, approved mock-ups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 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 and on-site installations.
 - 1. Coordinate: Requirements and procedures related to roof deck and roofing system construction:
 - a. Participants: authorized representatives of Contractor, Owner, 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. Coordinate: related work specified in other Sections.
- k. Inspection: Review Manufacturer's procedure for warranty.
- 1. On-site traffic: Review limits by other trades on vegetated roof assembly and procedures for compensation due to damage.
- m. Meeting minutes: Taken by representative of Consultant and distributed to all parties within 24 hours of meeting date.
- n. 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 Section 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: 20 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. Herbaceous Perennials, Ornamental Grasses, and Vines: Plantings shall grow to achieve and maintain at least 75 percent horticultural viability over planting area commencing with installation, through the duration of this warranty. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
 - 3. 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.
 - 4. Warranty Periods from Date of Installation:
 - a. Ground Covers: Two years.
 - b. Herbaceous Perennials, Ornamental Grasses, and Vines: Two years.
 - c. Woody Plants and Shrubs: 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: 3 years.
- 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: 5 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.tremcoroofing.com.
 - 2. Firestone SkyScape Pregrown Modular Systems; www.firestonebpco.com.
 - 3. LiveRoof in conjunction with other roof membrane manufacturers specified in section 07 51 00; www.liveroof.com.

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 and 4.0 gal/cu. ft. (535 L/cu. m) for VR Mod Meadow 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].
 - 2. VR Mod Meadow:
 - 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.

F. Sustainability: All components must be made from 100% recycled materials and produced within 500 mile (800 km) radius of project site.

2.3 VEGETATED ROOF ASSEMBLY COMPONENTS

- A. Root Barrier: PVC-KEE Capsheet as specified in Section 07 51 00.
- 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:
 - a. Water Retention, ASTM F 726-06: 0.05 gal/sq. ft. (2.02 L/sq. m).
- C. Horizontal Insulation: 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, unfaced; fabricated with shiplap or channel edges and with side facing Protection sheet having grooved drainage channels.
 - 1. Type VII, 60 psi (414 kPa).
 - 2. Thickness: As indicated on Drawings.
- D. VR Mod 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:

3.

- a. Physical Properties:
 - 1) Tray Dimensions: 15 in x 20 in x 5.75 in (381 mm x 508 mm x 146 mm).
- Hydraulic Properties:
- a. Water Retention Capacity: 1.1 gal/sq. ft. (45 L/sq. m).
- E. Technical Seam Tape: Self-adhered, waterproof membrane with acrylic pressure sensitive adhesive.
 - 1. Basis of Design Product: Tremco Inc., VR TecTape 2, 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.
- F. Drain Inspection Box: Manufacturer's standard drain inspection box formed from aluminum, with lockable lid and perforated at drainage course level.

- Basis of Design: Tremco Inc, VR DrainGuard 4. 1.
- 2. **Physical Properties:**
 - Thickness: 60 mil (1.52 mm). a.
 - 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).
- G. 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.
 - Basis of Design: Tremco, Inc., VR EdgeGuard 4. 1.
 - 2. **Physical Properties:**

a.

- Height: 5.97 in (151.64 mm).
- Thickness: 80 mil (2.03 mm). b. Flange Length: 4 in (101.60 mm). b.
- c. Length: 8 ft (2.5 m).
- d. Lip: 3/8 in (9.525 mm).
- e. Perforations, diameter: 3/4 in (19 mm).

VEGETATED ROOF GROWING MEDIA 24

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:
 - VR Mod Sedum: Sedum species that are healthy, vigorous, well-rooted, consisting of a 1. minimum of 5 varieties.

VEGETATION-FREE ZONE MATERIALS 2.6

- A. Walkway Roof Pavers: pre-cast concrete pavers with pedestals.
 - Basis of Design: Armtec, Pedslab. 1
 - a. Type 1: Diamond (Standard).
 - Type 2: Ledgerock (Standard). b.
 - c. Type 3: Random Brick (Shotblast).
 - **Physical Properties:** 2
 - a. Size: 24 in x 24 in (610 mm x 610 mm).
 - b. Thickness: 2-1/4 in (57 mm).
 - Weight: 11 lb/sq. ft. (54 kg/sq. m), minimum. c.
 - d. Colors and Textures: natural color with shot blast finish.
 - Mechanical Properties: 3.
 - a. Compressive Strength: 8000 psi (55 MPa), minimum.
 - b. Absorption: 5%, maximum.
 - Freeze-thaw Resistance: 1.0% loss in weight after 40 cycles, maximum. c.
 - 4. Paver Supports: Integral pedestals.

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. 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. Horizontal Insulation:
 - 1. Loosely lay insulation in parallel courses, staggering end laps and side laps. Abut edges and ends between units.
 - 2. Cut insulation to fit neatly at projections and terminations with less that 1-inch (25 mm) tolerance.
- D. 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.
- E. 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.
- F. 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. Roof Pavers: To roofed area, place geotextile fabric over insulation and cut to fit. Install roof pavers over over geotextile fabric. Push pavers against edging and ensure there is a tight fit between parapet wall and edging.
 - 1. Install roof pavers on paver supports set according to Manufacturer's written instructions.
 - 2. Tolerances:
 - a. Install pavers to vary not more than 1/16 inch (1.59 mm) in elevation between adjacent pavers and not more than 1/16 inch (1.59 mm) from surface plane elevation of individual paver.
 - b. Maintain tolerances of paving installation within 1/4 inch (6.35 mm) in 10 feet (3.048 m) of surface plane in any direction.

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

SECTION 07 51 00 - HOT APPLIED BUILT-UP ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the materials and application procedures for the installation of gravel surfaced, 4-ply, hot asphalt applied built-up roofing with cold adhesives applied aggregate.
- B. Roof Insulation.

1.2 RELATED DOCUMENTS

- A. Related Sections Include the Following:
 - 1. Section 05 31 00 Steel Deck
 - 2. Section 06 20 00 Rough Carpentry
 - 3. Section 07 62 00 Sheet Metal Flashing and Trim
 - 4. Section 07 90 00 Joint Sealants

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.
- D. Perform Work in accordance with NRCA Roofing and Waterproofing Manual, current edition; maintain one copy on site.
- E. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- F. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
 - 1. Fire/Windstorm Classification: Class 1A-90.
- G. Emergency Response Plan:
 - 1. Any damage to the building caused by the Work, leaks or accidents must be addressed immediately by the Contractor as an emergency.
 - 2. The Contractor must respond to leaks or problems at the site during construction with a repair crew within three hours of phone notification.
 - 3. Provide a complete emergency telephone list for at least three responsible company representatives that will be on call during the course of the Project; include cell phone numbers, pager numbers and home phone numbers.
 - 4. Designate one emergency contact in writing to Architect on a weekly basis.

- H. Nuisance and Odors: Prohibit asphalt nuisance/odor entrainment to adjacent occupied buildings. Coordinate notification of residents, placement of asphalt/bitumen mixers and temporary outage of HVAC outside air louver(s) with Owner representatives.
- I. Adhesives and Sealants (applied within the building waterproofing envelope): VOC content not to exceed 250 g/L.

1.4 SUBMITTALS

- A. Product Data: Submit characteristics on membrane materials, adhesives, seaming materials and flashing materials.
- B. Shop Drawings:
 - 1. Indicate joint and termination detail conditions and conditions of interface with other materials.
 - 2. Indicate membrane layout.
 - 3. Indicate layout of tapered insulation, crickets, saddles and tapered edge strips; only manufacturer's drawings will be acceptable.
 - 4. Receive approval of details relating to the installation of the roof system from the roofing material manufacturer; system to be installed in a manner that the manufacturer will furnish the specified warranty for the installation.
- C. Installer Certificates: Signed by roofing system manufacturer certifying that installer is approved, authorized, or licensed by manufacturer to install roofing system.
- D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of meeting performance requirements.
 - 2. Submit product and label data and certification with each load of bitumen asphalt to indicate flash point (FP) finished blowing temperature (FBT), softening point (SP), and equiviscous temperature (EVT).
 - 3. Submit certification of compliance with high-albedo (reflectance) and high-emissivity requirements.
- E. Associated Products Certificate: Provide a letter, on the roofing manufacturer's letterhead and signed by representative of the roofing manufacturer, accepting the products selected by the installer for prefabricated metal edge systems, prefabricated expansion joints, insulation and cover board to be covered within the total system warranty.
- F. Qualification Data: For installer and manufacturer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
 - 1. Indicate that bulk roofing asphalt materials delivered to Project comply with requirements. Include quantity and statistical and descriptive data for each product. Submit certificate with each load before it is used.
 - 2. Include continuous log showing time and temperature for each load of bulk asphalt, indicating date obtained from manufacturer, where held, and how transported before final heating and application on roof.
- H. Maintenance Data: For roofing system to include in maintenance manuals.
- I. Warranties: Submit specimen copy of the manufacturer's standard roofing warranty modified as required by this Section and other Contract Documents; Work cannot start prior to the Architect's review and comment on this specimen copy.

- J. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures and wind velocity during application; record time of technician's arrival and departure from site.
- K. Contract Closeout Submittals:
 - 1. Provide the original warranty to the Owner and a copy to the Architect.
 - 2. Submit a copy of the manufacturer's roof inspection report to the Owner along with the warranty.
 - 3. The warranty or an attachment to the warranty must specifically list the products covered by the warranty for this Project.

1.5 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.
- 1.6 PROJECT CONDITIONS
 - A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: A qualified manufacturer that has UL/FM listing for roofing system identical to that used for this Project.
 - 1. Provide a warranty upon satisfactory installation of the roofing system.
- B. Installer Qualifications:
 - 1. Approved by the manufacturer prior to the bidding period and throughout the installation and able to submit roofing material manufacturer's certification of acceptance.
 - 2. Installer must have installed at least five roofs of the same materials and methods specified for this Project.
 - 3. Installer's Field Supervision: Maintain a full-time supervisor/foreman on job site during all phases of bituminous sheet roofing work and at any time roofing work is in progress; proper supervision of workmen must be maintained. A copy of the specification, pertinent details, and manufacturer's instructions to be in the possession of the supervisor/foreman and on the roof at all times.
- C. Technical Representative Qualifications: An authorized full-time employee representative of manufacturer experienced in the installation and maintenance of the specified roofing system and qualified to determine Installer's compliance with the requirements of this Project.
 - 1. Factory Trained Technician Qualifications: An individual employed in the roofing industry for minimum of 7 years; provided inspection services on five similar projects within the past 12 months; received structured training by the manufacturer providing roofing for this project, and authorized by manufacturer to produce daily reports and decline work not in compliance with warranty requirements and Contract Documents.
 - 2. If manufacturer does not employ full time technical inspectors, the roofing contractor must acquire a full time factory trained technician on the Project that is a full time employee of the manufacturer or an independent roofing consultant employed by the Contractor.
 - 3. Under the Contractor's option to hire an independent roofing consultant, the consultant must have minimum 5 years experience as an independent consultant. And the

independent consultant can not be an employee of any other roofing company or have been an employee of this roofing installer in the past.

- 4. Each day that production is being performed, the technical representative/inspector must be on the project for a minimum of 4 hours.
- 5. The technical representative will be responsible to determine and enforce the most stringent requirements between the warranty and Contract Documents.
- D. Source Limitations:
 - 1. Obtain roof system components through sources acceptable to roofing manufacturer providing total system warranty. Provide a letter, on the roofing manufacturer's letterhead and signed by representative of the roofing manufacturer, accepting the products selected by the installer.
 - 2. The roofing manufacturer provided the total system warranty for the work of this section must also be the manufacturer providing the system required under Section 07556.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
- F. Preliminary Roofing Conference: Within 30 days of Notice-to-Proceed for construction, conduct conference at Project site. Comply with requirements for Preinstallation conferences in Division 1. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, technical representative or inspector, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review construction schedule and verify availability of materials, installer's personnel and designated superintendent, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review governing regulations and requirements for roofing system during and after installation.
 - 4. Review temporary protection requirements for roofing system during and after installation.
- G. Preinstallation Conference: Conduct conference at Project site two weeks prior to commencement of roof construction. Comply with requirements in Division 1. Review methods and procedures related to roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, technical representative or inspector, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review Emergency Action Plan.
 - 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel and designated superintendent, equipment, and facilities needed to make progress and avoid delays.

- 5. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
- 6. Review structural loading limitations of roof deck during and after roofing.
- 7. Review storage and protection requirements of insulation, cover board and roofing materials; cover board panels that become wet or stored in plastic wrapping must be removed and not used on the Project regardless of drying efforts.
- 8. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
- 9. Review governing regulations and requirements for insurance and certificates if applicable.
- 10. Review roof observation and repair procedures after roofing installation.
- H. Should there be any deviation from the Contract Documents without the prior written consent of the roofing material manufacturer and the Architect; the Contractor must do all necessary corrective work to make the roof acceptable to the Architect at no additional cost to the Owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. 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, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
 - 1. Protect stored liquid material from direct sunlight.
 - 2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources; store in a dry location.
 - 1. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
 - 2. Remove and do not use cover board panels that become wet or stored in plastic wrapping from the project site regardless of drying efforts.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed according to manufacturers' written instructions and warranty requirements.
- B. Environmental Requirements:
 - 1. Never apply membranes during inclement weather, or when the forecast for rain is greater than 30 percent. (These days should be documented as "no work rain days").
 - 2. Ambient Air Temperatures:
 - a. No cold adhesives should be applied on any vertical surfaces above 100 degrees F.
 - b. Hot asphalt roofing should not be done below 45 degrees F.
 - 3. Do not apply roofing membranes to wet, damp, or frozen deck surfaces, or when moisture (dew, snow, fog, ice or frost) is present in any amount in or on the materials.

- 4. Check with local weather during periods of high humidity, nighttime roofing, to ensure moisture is not being trapped in the system; no roofing should occur within 5 degrees of the dew point temperature based upon relative humidity.
- 5. Check with manufacturer for "special" installation instructions whenever application temperatures are questionable.
- 6. Never apply membranes in dusty, debris prone areas that can contaminate adhesion.
- 7. Keep all materials dry, warm, and covered immediately prior to use.
- 8. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- C. Remove wet or improperly stored insulation and cover from the job site.
- D. Field Measurements and Material Quantities: Contractor has sole responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect Work.
- E. Asphalt Heating: Use tankers to heat asphalt. No kettles allowed on the job site.

1.10 SEQUENCING AND SCHEDULING

- A. Coordinate Work with installing associated metal flashings as Work of this Section proceeds.
- B. Verify the Work of other trades which is to be concealed by this Work; Work to be concealed, must be inspected and approved before proceeding with the installation.

1.11 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 included 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 Trilaminate 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 (At Vegetated Roof Location)

- A. Thermoplastic PVC-KEE Sheet, Fleece-Backed: Basis of design product: Tremco, TPA FB Roof Membrane: ASTM D 4434, Type IV, internally fabric reinforced and fleece-backed, uniform, flexible TPA sheet, Energy Star qualified, CRRC listed and California Title 24 Energy Code compliant.
 - 1. Tensile Strength at 0 deg. F (-18 deg. C), minimum, ASTM D 6509: 350 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, 35 percent; cross machine direction, 33 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 FLASHING MATERIALS (At Non-Vegetated Roof Location)
 - 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
- B. Glass-Fiber Fabric for Stripping: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.
- C. Elastomeric Flashing Adhesive: Basis of Design: Tremco, Sheeting Bond White: One-part, asbestos-free, cold-applied, SEBS/SIS-based, elastomeric trowel-grade adhesive specially formulated for compatibility and use with specified roofing membranes and flashings, with the following properties:
 - 1. Adhesion in Peel, minimum, ASTM D 1876: 3 lbf/in (0.5 N/mm).
 - 2. Lap Shear Adhesion, minimum, ASTM D 816: 18 psi (124 kPa).
 - 3. Asbestos Content: ASTM D 276: None.
 - 4. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 250 g/L.
- D. Flashing Sheet Stripping Adhesive: Basis of design: Tremco, Rock-It Adhesive: One-part, white, highly reflective polymeric surfacing adhesive, CRRC listed and California Title 24 Energy Code compliant when combined with approved white gravel, with following physical properties:
 - 1. Asbestos Content, EPA 600 R-93/116: None.
 - 2. Volatile Organic Compounds (VOC), maximum, ASTM D 6511: 250 g/L.
 - 3. Nonvolatile Matter, minimum ASTM D 6511: 50 percent.
 - 4. Flash Point, minimum, ASTM D 93: 120 deg. F (49 deg. C).
 - 5. Reflectance (adhesive plus aggregate), ASTM C 1549: 71 percent.
 - 6. Thermal emittance (adhesive plus aggregate), ASTM C 1371: 0.85.
 - 7. Solar Reflectance Index (SRI), adhesive plus gravel, ASTM E 1980: 86.
- E. Stripping ply for 2-ply stripping of metal flange flashings:
 - 1. Base layer of 2-ply stripping ply:
 - a. Roof membrane base sheet.
 - b. 6 inches minimum.
 - 2. Top layer of 2 ply stripping ply:
 - a. Roof membrane base sheet.
 - b. 3 inches beyond base layer (9 inches minimum).
 - 3. Stripping ply adhesive: Type III Hot Asphalt.
 - 4. Primer for metal flanges:
 - a. Water-based Primer.
 - b. Low volatile (VOC) primer.
- F. Flashing Sealant Tape:
 - 1. Teflon Tape Flexible butyl based sealant tape.
 - 2. Dimensions: 1/8 inch by 1 inch.

2.7 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.
- 2.8 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.
- 2.9 COATING MATERIALS (At Non-Vegetated Roof Locations)
 - A. Flashing Primer: Basis of design product: Tremco SP Primer or Approved Equal: Asbestos-free, acrylic-based primer formulated for use with acrylic latex coatings, with the following physical properties:
 - 1. Asbestos Content, EPA 600 R-93/116: None.
 - 2. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 80 g/L.
 - B. Flashing Coating: Basis of Design: Tremco, ICE Coating or Approved Equal: Water-based, Energy Star qualified, CRRC listed and California Title 24 Energy Code compliant elastomeric roof coating formulated for use on bituminous roof surfaces, with the following physical properties:
 - 1. Asbestos Content, EPA/600/R-93/116: None.
 - 2. Volatile Organic Compounds (VOC), ASTM D 3960: 39 g/L.
 - 3. Reflectance, minimum, ASTM C 1549: 86 percent.
 - 4. Emissivity, minimum, ASTM C 1370: 0.93.
 - 5. Solar Reflectance Index (SRI), ASTM E 1980: 103.
 - 6. Two (2) coats at 1 gallon a square
 - C. White Cold Applied Flood Coat and Aggregate Surfacing:
 - 1. Flood coat shall be Rock-it Adhesive by Tremco or Approved Equal. A white cold applied, highly reflective low volatile surfacing adhesive.
 - 2. Provide aggregate surfacing that will withstand weather exposure without significant deterioration and will not contribute to membrane degradation, of the following type and size:

- a. #1 White Highly Reflective Marble Roofing Chip Aggregate.
- Reflectance (adhesive plus aggregate), ASTM C 1549: 71 percent.
- 4. Thermal emittance (adhesive plus aggregate), ASTM C 1371: 0.85.

2.10 MISCELLANEOUS ACCESSORIES

A. Provide miscellaneous accessories recommended by roofing system manufacturer for a complete system.

2.11 INSULATION MATERIALS

3.

- A. General: Provide preformed, roofing insulation boards that comply with requirements, selected from manufacturer's standard sizes and of thicknesses indicated.
 - 1. Provide preformed, tapered insulation boards where indicated for sloping to drain. Fabricate with a taper of 1/4-inch per 12 inches, unless otherwise indicated.
 - 2. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
 - 3. Emissions: Meet testing requirements of Section 016116.
- B. Rigid Polyisocyanurate Roof Insulation:
 - 1. Available Manufacturers:
 - a. ENRGY 3 by Johns Manville.
 - b. H-Shield by Hunter Panels.
 - c. Hy-Therm AP-25 by DOW Chemical Company.
 - d. Roofing Manufacturer.
 - 2. Physical Properties:
 - a. Long Term Thermal Resistance (ASTM C518): LTTR = 6.0 per 1 inch of thickness.
 - b. Board Size: 48 inches x 96 inches.
 - c. Nominal Product Thickness: 3.8 inches; areas of tapered insulation is an additional thickness of insulation; roof drains tapered as indicated.
 - d. Compressive Strength (ASTM D1621): Minimum 25 psi (170kPa).
 - e. Density (ASTM D1622): 2 pcf.
 - f. Edges: Square.
 - g. Dimensional Stability: Less than 2 percent linear change.
 - 3. Provide tapered insulation as indicated on Drawings; 1/4 inch per running foot.
- C. Cover Board: Product selection must be accepted by roof manufacturer within the roofing warranty.
 - 1. Cover Board (Top Layer): ASTM C 728, perlite board, seal coated.
 - a. Thickness: 1 inch.
 - b. Representative Product: Fesco Board manufactured by Johns Manville.

2.12 INSULATION ACCESSORIES

- A. General: Furnish roofing insulation accessories recommended by insulation manufacturer for intended use and compatible with sheet roofing material.
- B. Fasteners: Fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470.
 - 1. Underlayment, Insulation, Tapered Insulation and Cover Board:
 - 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. Do not exceed depth of metal deck.
- e. Acoustical Deck Locations: Fasteners not to exceed length necessary to remain concealed in acoustical cells of steel deck.
- C. Tapered Edge Strips: Rigid, cellulosic-fiber insulation board, complying with ASTM C 208, Type 2; coated on six sides.

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.

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 (At Vegetated Roof Location)

- 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 GENERAL FLASHING REQUIREMENTS AND STRIPPING INSTALLATION (At Non-Vegetated Roof Locations)

- A. Install PVC-KEE Flashing using flashing adhesive:
 - 1. Adhere elastomeric sheeting completely to flashing surface, cant, and roofing with a ¹/₄ inch notched trowel at 1 gallon per 20 sq. ft. of flashing adhesive, immediately embed elastomeric sheeting into the flashing adhesive.
 - 2. Apply consistent pressure to entire surface of elastomeric sheeting using a steel hand roller to achieve full adhesion of the sheeting to the flashing substrate. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 6 inches.
 - 3. Seal horizontal edges of sheeting to roof surface with reinforcing mesh embedded in a base course of adhesive and a top course of adhesive to fully cover the mesh.
 - 4. Seal vertical laps by heat welding the flashing sheet together. Probe the seam when complete to ensure complete weld
 - 5. Elastomeric sheeting width: sufficient to extend at least 6 inches beyond toe of cant onto new roof.
 - 6. Secure top edge of flashing membrane with metal termination bar and Teflon Tape. Fasten bar 6 to 8 inches o.c. Seal termination bar with three-course reinforcing mesh and asphaltic mastic as required.
- B. Two Ply striping for metal flanges:

- 1. Set flange in asphalt mastic. Seal flange with two striping plies embedded between alternate applications of stripping adhesive/bitumen. Extend first ply 3 inches beyond flange; second ply 3 inches beyond first ply.
- 3.8 FLASHING SURFACING APPLICATION (At Non-Vegetated Roof Locations)
 - A. Surfacing Treatment for Flashings:
 - 1. Prepare surface as required by roofing system manufacturer.
 - 2. Spot Apply White Coating over exposed flashing membrane surfaces where any black asphalt or mastics are on flashing.
 - a. Prime flashing with the flashing primer.
 - b. Apply two coats of flashing coating at one gallon per square.
- 3.9 COLD APPLIED ROOF SURFACING APPLICATION (At Non-Vegetated Roof Locations)
 - A. Prior to application of flood coat, Contractor shall inspect roof with manufacturer's technical representative and repair any deficiencies.
 - B. Prior to application of flood coat, Contractor shall clean and prime roof surface areas that have become contaminated with dirt and/or debris. Prime contaminated areas with Low volatile primer at a rate of 200 to 400 square feet per gallon.
 - C. Aggregate Surfacing:
 - 1. Over entire cleaned, prepared roof surface apply uniform and continuous flood coat of white surfacing adhesive at a rate of 5 gallons per 100 sq. ft.
 - 2. Aggregate Weight: 250 lb/100 sq ft.
 - 3. If flood coat and aggregate surface is delayed 6 months, promptly apply glaze coat of hot roofing asphalt at a rate of 20 lb/ 100 sq ft.

3.10 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.

3.11 WALKWAY PAD APPLICATION

- A. Install walkway pads at roof access points, under wood sleepers, satellite dish, and to match existing walkway plan.
 - 1. Prime clean, smooth membrane ply surface with Low volatile (VOC) primer.
 - 2. Install walkway pads in spot adhesion using asphaltic mastic to ply surface.

3.12 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.

3.13 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

3.14 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.

PART 4 - INSTALLER'S WARRANTY CONDITIONS

4.1 WHEREAS ______ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

- A. Owner:
- B. Address:
- C. Building Name/Type:
- D. Address:
- E. Area of Work:
- F. Acceptance Date:
- G. Warranty Period:
- H. Expiration Date:

- 4.2 AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- 4.3 NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- 4.4 This Warranty is made subject to the following terms and conditions:
 - A. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - 1. lightning;
 - 2. peak gust wind speed exceeding __ mph;
 - 3. fire;
 - 4. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - 5. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work not installed by this installer;
 - 6. vapor condensation on bottom of roofing; and
 - 7. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 - B. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 - C. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 - D. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 - E. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 - F. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

- G. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- 4.5 IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 201__.
 - A. Authorized Signature:
 - B. Name: _____

END OF SECTION

SECTION 07 54 19 - THERMOPLASTIC MEMBRANE ROOFING (PVC)

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes complete engineered fully adhered PVC sheet roofing system applied over a structural roof deck.

1.2 PERFORMANCE REQUIREMENTS

- A. The "roofing system", for the purpose of defining a limitation of warranty coverage, shall include all the materials and methods described by the roofing materials manufacturer in his current published specifications, written recommendations, and details as his "roofing system" or "roofing design" for application to the pertinent structural roof deck.
- B. Roofing System Design: Provide a roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist 90 pounds per square foot uplift pressure calculated according to ASCE 7.
- C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
 - 1. FM 4470. Class I, 1-90.
 - 2. Provide letter certifying that proposed roof system meets FMRC approval with vapor retarder included.
- D. Emergency Response Plan:
 - 1. Any damage to the building caused by the Work, leaks or accidents must be addressed immediately by the Contractor as an emergency.
 - 2. The Contractor must respond to leaks or problems at the site during construction with a repair crew within three hours of phone notification.
 - 3. Provide a complete emergency telephone list for at least three responsible company representatives that will be on call during the course of the Project; include cell phone numbers, pager numbers and home phone numbers.
 - 4. Designate one emergency contact in writing to Owner on a weekly basis.

1.3 SUBMITTALS

- A. Within 30 days of Notice to Proceed, the Contractor shall submit the following:
 - 1. Copies of specification; if deviations from Contract Specifications are required by the roofing system manufacturer, clearly indicate such deviations.
 - 2. Manufacturer's product data for each roofing component.
 - 3. Manufacturer's standard maintenance manuals as specified in Division 1.
 - 4. Specimen copy of roofing system warranties as prepared and accepted by the roofing system manufacturer.
 - 5. Written certification of the roofing installer's experience and authorization from roofing system manufacturer.
 - 6. Dimensioned Shop Drawings which shall include:
 - a. Outline of roof area(s) with dimensions.
 - b. Plan locations and profile details of flashing methods for penetrations and terminations.

- c. Typical and special details, including those that differ greatly from the published documents.
- d. Tapered insulation layouts with high and low elevations, drain locations, etc.
- e. Metal batten and termination bar locating plans.
- f. Technical acceptance from roofing system manufacturer.
- B. Manufacturer's Certificate: Certify products meet or exceed specified performance requirements and acceptance of applicator.
 - 1. Submit evidence of meeting performance requirements.
 - 2. Associated Products Certificate: Provide a letter, on the roofing manufacturer's letterhead and signed by representative of the roofing manufacturer, accepting the products selected by the installer for prefabricated metal edge systems, prefabricated expansion joints, insulation and cover board to be covered within the total system warranty.
- C. Professional Engineers Certification:
 - 1. Provide manufacturer's signed and sealed ASCE 7-05 Design Velocity Pressure Calculation, with complimentary roof plan delineating field, perimeter and corner area dimensions.
 - 2. Provide manufacturer's signed and sealed written certificate from a Professional Engineer verifying that manufacturer's system meets and/or exceeds the Design Velocity Pressure Calculation for all areas of the roof. NOTE: Submit roof plan with exact system attachment and assembly per each area.
- D. Professional Engineer to be registered in the State of Maryland.
- E. Qualification Data: For Installer and manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- G. Maintenance Data: For roofing system to include in maintenance manuals.
- H. Warranties: Special warranties specified in this Section.
- I. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.
- J. Manufacturer's product data including Energy Star certificate and emissivity data.
- K. LEED Report: For products having recycled content, documentation indicating percentages by weight of pre-consumer and post-consumer recycled content. Include statement indicating cost of each product with recycled content.
- L. LEED Report: For roof surface, documentation indicating Solar Reflectance Index (SRI).

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
 - 1. Firm experienced in application or installation of systems similar in complexity to those required for this project.
 - 2. Successful completion of a minimum 5 projects of comparable scale and complexity.
 - 3. An adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

- 4. Maintain full-time supervisor/foreman, not workman/foreman, on job site during times that roofing work is in progress. Supervisor must have minimum of three years experience in roofing work similar to the nature and scope specified.
- 5. Authorized installer shall have a repair crew or shall contract with a repair crew within a 100 mile radius of the project. A copy of the specification, pertinent details, and manufacturer's instructions to be in the possession of the supervisor/foreman and on the roof at all times.
- B. Installer's key personnel shall have been trained by roofing manufacturer.
- C. Manufacturer Qualifications: A qualified manufacturer that has UL listing for membrane roofing system identical to that used for this Project.
- D. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- E. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.
 - 1. The roofing manufacturer provided the total system warranty for the work of this section must also be the manufacturer providing the system required under Section 07 33 63.
 - 2. Obtain roof system components through sources acceptable to roofing manufacturer providing total system warranty. Provide a letter, on the roofing manufacturer's letterhead and signed by representative of the roofing manufacturer, accepting the products selected by the installer.
- F. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
 - 2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
- G. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Execution Requirements."
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 4. Review structural loading limitations of roof deck during and after roofing.
 - 5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 - 6. Review governing regulations and requirements for insurance and certificates if applicable.
 - 7. Review temporary protection requirements for roofing system during and after installation.

- 8. Review roof observation and repair procedures after roofing installation.
- H. Should there be any deviation from the Contract Documents without the prior written consent of the roofing material manufacturer and the Architect; the Contractor must do all necessary corrective work to make the roof acceptable to the Architect at no additional cost to the Owner.
- I. Provide a full time factory trained technician on the Project that is a full time employee of the manufacturer or an independent roofing consultant employed by the Contractor. Each day that production is being performed, the technical inspector must be on the project for a minimum of 4 hours.
 - 1. Under the Contractor's option to hire an independent roofing consultant, the consultant must have minimum 5 years experience as an independent consultant. And the independent consultant can not be an employee of any other roofing company or have been an employee of this roofing installer in the past.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All products delivered to the job site shall be in manufacturer's original unopened containers or wrappings with all labels intact and legible.
- B. Handle all materials to prevent damage. Place all materials on pallets and fully protect all materials from moisture.
- C. Membrane rolls shall be stored lying down.
- D. Bonding adhesive shall be stored at temperatures above 40 degrees F.
- E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on container or supplied by material manufacturer/supplier.
- F. Any materials which are determined as damaged by the Owner's Representative are to be removed from the job site and replaced at no cost to the Contract.

1.6 PROJECT CONDITIONS

- A. The installer shall take care during application and storage that overloading of the deck and structure does not occur.
- B. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Where such access is absolutely required, the installer shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas in accordance with roofing system manufacturer's recommendations.
- C. Prior to and during applications, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air and/or similar methods.
- D. Liquid materials such as solvents and adhesives shall be stored and used away from open flames, sparks and excessive heat.
- E. Contaminants, such as petroleum products, acids, grease, fats, oils, and solvents shall not be allowed to come into contact with the roofing membrane. Any such contact shall be reported to roofing system manufacturer's representative.
- F. Contractor shall verify that all roof drain lines are unblocked before starting work. Report any blockages to the Architect immediately.
- G. If any unusual or concealed condition is discovered, stop work and notify Architect immediately in writing.

- H. Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.
- I. Upon completion of work, remove all tools, equipment, scrap material and debris related to the work of the Contract.
- J. All landscaped areas damaged by construction activities shall be raked clean and restored to original condition.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's No-Dollar-Limit (NDL) form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
 - 1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover boards, substrate board, vapor retarder and other components of membrane roofing system.
 - 2. The warranty will be a total system warranty; no exclusion of any materials including perimeter metal, metal trim and expansion joints.
 - 3. Warranty cannot exclude damage resulting from wind; warranty must cover roof damage resulting from wind speeds up to and including 60 mph.
 - 4. Manufacturer's roof system warranty must include repair of damages caused by winds less than the wind speed used for Design Velocity Pressure Calculation submitted by the Professional Engineer.
 - 5. Warranty Period: 20 years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of membrane roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PVC SHEET ROOFING

- A. Manufacturers:
 - 1. Basis-of-Design: Sika Sarnafil (U.S.) Inc.; G410 Roof Membrane
 - a. Specified membrane, fleece backed, with applied Décor System ribs.
 - 1) Thickness: 60 mils (0.060 inch).
- B. Other Acceptable Manufacturers:
 - 1. Fibertite: Simulated Metal Roof.
 - 2. Duro-Last: Vinyl Rib Roofing System.
 - 3. Carlisle: Simulated Metal Roof.
- C. Materials:
 - 1. Membrane:
 - a. ASTM D4434, Type II, Grade 1 or Type III.
 - b. Material: Non-woven fiberglass-reinforced or polyester-reinforced PVC.

- c. Color: As selected by Architect from manufacturer's available selection; Energy Star Certified. Roof Surface Solar Reflectance Index (SRI): Minimum 78 for low-sloped roofs minimum 29 for steep-sloped roofs.
- 2. Applied Rib Profile:
 - a. Size: 1 inch high, 1/2 inch thick, with a 1 3/8 inch base width.
 - b. Color: Match roof membrane.
- 3. Related Materials: Products to be manufactured by or approved by the primary membrane manufacturer for the specified warranted roofing system.
 - a. Flashing membrane: Same as roofing membrane.
 - b. Adhesives: Water-based or solvent based materials as provided by the roofing manufacturer for particular use.
 - c. Prefabricated PVC expansion joint cover with nailing flanges and welding flaps.
 - d. Prefabricated Components: Inside/outside corners, vent stack flashings, etc. as provided by membrane manufacturer.
 - e. Wood Nailers: Treated No. 2 grade lumber.
 - f. Termination Bar: Flat galvanized (16 gauge) steel or aluminum bar pre-punched every 12 inches on center.
 - g. Perimeter Bar: 14 gauge galvanized steel bar, channel shaped, punched 1 inch on center, for use as a 4-foot perimeter bar.
 - h. Sealants: As required by the roofing membrane manufacturer.
 - i. Vapor Retarder: 32 mil polyethylene vapor/air retrader; butyl tape at seams and perimeter.
 - j. Walkway: Traffic bearing, heat weldable walkway pads, minimum 96 mil thick; not less than 36 inches wide, refer to roof plan for locations.
 - k. Water Cut-Off Mastic: Compatible with membrane materials.
 - 1. Night Seal: Compatible with membrane materials as recommended by roofing manufacturer.
 - m. Fasteners: Factory Mutual approved, corrosion resistant in accordance with FM Standard 4470, compatible with materials being fastened and substrates being fastened to, and acceptable to roofing manufactuer.

2.2 INSULATION

- A. Type: Isocyanurate insulation boards with fiberglass facers. Insulation shall be fabricated in tapered and non-tapered boards as required.
- B. Insulation Thickness: Minimum of 4 inches.
- C. Fabrication of tapered insulation:
 - 1. Factory pre-cut boards not to exceed 4' x 4' with top surface cut to provide a continuous slope indicated on Drawings.
 - 2. Tapered insulation exceeding 4 inches shall be in two layers, to include starter and filler blocks fabricated to assure staggering of all vertical joints both ways between layers.
 - 3. All miters shall be factory cut, consisting of two diagonally cut abutting blocks with matching edges and thickness.
 - 4. Each piece shall be identified in accordance with reviewed shop drawings.

2.3 ADDITIONAL COMPONENTS

- A. Cover Board:
 - 1. Provide 1/2 inch minimum thickness "Dens-Deck Prime Roof Board" fiberglass-faced gypsum roof board as manufactured by Georgia-Pacific.

- 2. Water-resistant gypsum core.
- 3. Location: Provide as top layer over insulation.
- B. Vapor Retarder: In addition to vapor retarder provided under subsection 2.1, of this Section.
 - 1. Self-Adhering, Polyethylene-Faced Sheet: The membrane is a composite of polyethylene film and self-adhesive rubberized asphalt. Edges of the membrane contain exposed beads of rubberized asphalt beyond the film and an embossed slip-resistant surface is provided on the polyethylene. It shall conform to the following physical properties:
 - a. Color: Grey-Black.
 - b. Thickness: 32 mils.
 - c. Tensile Strength: 1720 Kn/M2 (250 psi)
 - d. Elongation Ultimate failure of rubberized asphalt (%): 250
 - e. Low Temp. Flexibility: Unaffected @ -20°C (-29°F)
 - f. Permeance (Perms): 2.9 ng/M2 sPa (max.) (0.05 Perms)
 - 1) Product: Grace Ice & Water Shield or Sarnavap Self Adhered.
 - 2. Provide self-adhering membrane at perimeter interfaces and at all penetrations through polyethylene vapor retarder to ensure continuity of vapor seal.

PART 3 - EXECUTION

3.1 INSPECTION OF SURFACES

- A. Verify that work of other trades which penetrates roof decks has been completed and that such work has been properly installed and will not adversely affect the installation or performance of the roofing system.
- B. Examine substrate surfaces for finish acceptability, adequate anchorage, foreign materials, moisture and other conditions which would adversely affect the roofing system application and performance.
- C. Do not proceed with installation until all unacceptable conditions have been corrected.
- 3.2 INSTALLATION GENERAL
 - A. Install in accordance with roofing system manufacturer's written instructions and accepted Shop Drawings.
 - B. Roof decks shall be thoroughly dry, and their conditions accepted by roofing system manufacturer's representative before application of roofing.
 - C. Inspections of installation shall be made by a responsible representative of roofing system manufacturer during application and after completion.
 - D. Roofing insulation shall be dry when installed and shall be protected from the weather during installation. Any materials which become wet shall be removed from the site and replaced with new dry materials.
 - E. When installation of roofing system is begun, the roofing system in that area shall be completed, before end of day and/or before being wet by the elements.
 - F. Install temporary water cut-offs at completion of each days work and remove upon resumption of work.
- 3.3 INSTALLATION OF ROOFING SYSTEM
 - A. Wood Nailers:
 - 1. Install continuous treated wood nailers as detailed.
- 2. Nailers shall be anchored to resist a minimum force of 300 pounds per lineal foot in any direction. Fastener spacing shall be a maximum of 3 feet on center. Fasteners shall be installed within 6 inches of each end. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.
- 3. Allow a 1/2 inch open space between adjacent lengths of nailers.
- 4. Thickness shall be as required to match substrate or insulation height.
- 5. Existing woodwork that is in questionable condition shall be removed and replaced with suitable new materials.
- B. Insulation:
 - 1. Mechanically attach insulation; install insulation in a minimum of two layers.
 - 2. All insulation laid in parallel courses with end joints staggered. Joints between insulation boards and various penetrations shall not exceed 1/4" in width. Second layer shall be laid transverse to first layer with all joints staggered.
 - 3. Insulation shall be neatly cut to fit around penetrations and projections and to form sump around roof drains.
- C. Cover Board:
 - 1. The surface of the insulation must be clean, dry and smooth with no unsound surfaces such as broken or damaged insulation boards.
 - 2. Install over insulation perpendicular to the narrow width of insulation boards with end joints staggered in adjoining rows and a 1/8" space between boards.
 - 3. Secure boards through to deck with acceptable mechanical fasteners in quantities and patterns conforming with Roofing Manufacturer's recommendations.
 - 4. Fastener tools shall have a depth locator as recommended or supplied by fastener manufacturer to ensure proper installation. Pullout tests will be observed by Roofing Manufacturer's representative to verify deck condition and actual pullout values.
- D. Roofing Membrane:
 - 1. Inspect surface of the membrane underlayment board prior to installation of roofing membrane. Surface must be clean, dry and smooth with no excessive surface roughness, contaminated surfaces, or unsound surfaces such as broken or damaged boards.
 - 2. Adhesive type(s), spread rates and membrane installation procedures shall be in strict accordance with roofing system manufacturer's printed instructions and accepted Shop Drawings.
 - 3. Prime cover board with adhesive.
 - 4. Coat membrane with adhesive and roll onto membrane underlayment board in such manner as to eliminate wrinkles and trapped air. When adhesive on either surface has dried excessively, then the surface in question must be recoated.
 - 5. After the substrate and membrane surfaces have been mated, the bonded surface must be pressed firmly in-place with a water-filled, foam-covered lawn roller.
 - 6. All seams hot air welded with minimum lap of 3" when machine welding and a minimum of 4" when hand welding. All welding equipment must be of type(s) recommended by roofing system manufacturer. Do not apply adhesive to weld areas.
- E. Membrane Flashings:
 - 1. All membrane flashings shall be installed concurrently with the roof membrane as job progresses. No temporary flashings shall be allowed without the prior written approval of Architect and roofing system manufacturer. If any water is allowed to enter under new roofing due to incomplete flashings, the entire affected area shall be removed and replaced at no expense to the Owner.

- 2. Membrane flashings shall be fully adhered to compatible, dry, smooth and solvent-resistant surfaces.
- 3. Hot air weld membrane flashings at joints and junctions with roof membrane.
- 4. All membrane flashing shall extend a minimum of 8 inches above roof membrane level unless previously accepted by roofing system manufacturer.
- F. Metalwork:
 - 1. Complete all metalwork in conjunction with roofing and flashings so that a watertight condition exists daily.
 - 2. Metal shall be installed to provide adequate resistance to bending and to allow for normal thermal expansion and contraction.
 - 3. Metal joints shall be watertight.
 - 4. Membrane-clad metal flashings shall have a 4 inch minimum nailing flange and shall be fastened into solid wood blocking with fasteners of same type with two rows of annular ring nails, 4 inches on center, staggered. Fasteners shall penetrate wood nailer a minimum of 1-1/4 inches.
 - 5. Provide all required accessories for complete installation.
 - 6. Install metal batten and termination bars, with acceptable fasteners spaced 12 or 8 inches on center, at locations and in patterns recommended by roofing system manufacturer and as indicated on accepted Shop Drawings. Cover bars with 8 inch wide strip of roofing membrane and hot air weld in place.
- G. Expansion Joints:
 - 1. Install over wood grounds, curbs, and cant strips formed into a bellow to allow for expansion and contraction.
 - 2. Bed flanges in in sealant recommended by manufacturer. Securely nail-in-place through metal flanges then cover nailing flanges with top layer of Sarnafil membrane and heat-weld in place.
 - 3. Do not stretch membrane sheets.
 - 4. Extend roof expansion joint assemblies over curbs, parapets and other elements in the construction profile with factory-fabricated transitions to provide continuous, uninterrupted, waterproof roof expansion assemblies.
 - 5. Splice roof expansion joint assemblies with materials provided by manufacturer in accordance with written instructions.
 - 6. Heat-weld ends of sections together and to form continuous joint covers.
 - 7. Install mineral-fiber blanket insulation to fill joint space within joint and moisture barrier
- H. Applied Rib Profile:
 - 1. Spacing: 18-3/4 inches on center.
 - 2. Heat weld ribs in a straight line parallel to slope per manufacturers recommendations.
- I. Walkway:
 - 1. Heat weld to membrane in configuration shown on Drawings and in accordance with roofing system manufacturer's instructions.
 - 2. Install between and over the bars and cover strips, at all roof areas subject to window-washing equipment movement and other maintenance traffic.

3.4 ROOF DRAINS

- A. Use tapered insulation around roof drain to provide smooth transition from roof surface to drain clamping ring.
- B. The practice of "shaving" roof insulation to create taper is not permissible.

- C. Follow roofing manufacturer's approved details for installation of membrane flashing at roof drains.
- D. Seal between membrane and the drain bowl as recommended by roofing manufacturer.

3.5 FIELD QUALITY CONTROL

- A. Correct identified defects or irregularities.
- B. Manufacturer Inspection Service:
 - 1. Prior to, during installation and at completion of the installation, inspections must be made by a representative of the manufacturer in order to ascertain that the roofing system has been installed according to their published specifications, standards and details.
 - 2. Keep the Architect and Owner informed as to the progress and quality of the Work as observed.
 - 3. Provide job site inspections:
 - a. Minimum of one four-hour workday at start of job, during peak roofing operations and at completion of roofing.
 - b. Provide a written daily report when onsite indicating the exact hours present.
 - 4. Report to the Architect in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
- C. Independent Testing Agency Testing: Owner may engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- D. Final Inspection:
 - 1. Prior to Substantial Completion, the representative of the roofing material manufacturer must make an inspection in order to ascertain that the roofing system has been installed properly; notify the Architect and Owner 48 hours in advance of date and time of inspection.
 - 2. There will be no deviation from this Section, without prior written consent of the Architect and manufacturer, who will have the option of refusing to accept the installation.
 - 3. Confirm that the manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.
 - 4. Repair of Deficiencies: Installations or details noted as deficient during Final Inspection must be repaired and corrected by applicator, and made ready for reinspection, within five working days.
 - 5. Warranty will be issued upon approval of the installation.
- E. Confirm that roof drains are clear and free flowing.

3.6 CLEANING

- A. In areas where finished surfaces are soiled by Work of this Section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- B. Repair or replace defaced or disfigured finishes caused by Work of this Section.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect building surfaces against damage from roofing Work.
- B. Prevent materials from entering or clogging drains and conductors.
- C. Prevent adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

- D. Replace or restore other Work damaged by installations of the roofing system.
- E. Where traffic must continue over finished roof membrane, protect surfaces.
 - 1. For roof areas that are to remain intact and that are subject to foot traffic and damage, provide temporary wood walkways with notches in sleepers to permit free drainage; walkway design to resist wind conditions.
 - 2. Provide fiberboard cover over roofing membrane under temporary wood walkways and adjacent areas; round all edges and corners of wood bearing on roof surface.
 - 3. Receive approval from roofing material manufacturer representative before any traffic is permitted over any new roofing.
- F. Protection of Property:
 - 1. Provide protection of property during course of roofing Work.
 - 2. Protect lawns, shrubbery, paved areas, and building from damage; necessary repair of damages will be at no extra cost to Owner.
- 3.8 ROOFING INSTALLER'S WARRANTY
 - A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 - 1. Owner: <Insert name of Owner.>
 - 2. Address: <Insert address.>
 - 3. Building Name/Type: <Insert information.>
 - 4. Address: <Insert address.>
 - 5. Area of Work: <Insert information.>
 - 6. Acceptance Date: <Insert date.>
 - 7. Warranty Period: 20 years
 - 8. Expiration Date: <Insert date.>
 - B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
 - C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
 - D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding <Insert wind speed> mph (m/sec);
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

- 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
- 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
- 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
- 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
- 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
- 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.
 - 1. Authorized Signature: <Insert signature.>
 - 2. Name: <Insert name.>
 - 3. Title: <Insert title.>

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following sheet metal flashing and trim:
 - 1. Manufactured reglets.
 - 2. Formed wall flashing and trim.
 - 3. Exposed trim not part of other assemblies.
 - 4. Parapet wall covering.

1.2 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, rattling, leaking, and fastener disengagement.
- B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identify material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
 - 4. Details of expansion-joint covers, including showing direction of expansion and contraction.
- C. Samples for Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.
 - 1. Include similar samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Sheet Metal Flashing: 12 inches long. Include fasteners, closures, and other attachments.
 - 2. Trim: 12 inches long. Include fasteners and other exposed accessories.
 - 3. Accessories: Full-size Sample.

1.4 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- B. Mockups: Demonstrate aesthetic effects and set quality standards for fabrication and installation, as appropriate within wall construction mockups required under other sections.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, and roof-mounted equipment.
 - 2. Review methods and procedures related to sheet metal flashing and trim.
 - 3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
- 1.6 COORDINATION
 - A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 PRODUCTS

2.1 SHEET METALS

- A. Aluminum Sheet: ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:
 - 1. High-Performance Organic 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 manufacturers' written instructions.
 - a. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2604.
 - b. Color: Match Architect's samples.
 - 2. Aluminum Thickness: Fabricate components not specified under other Sections or indicated on Drawings, from coil stock minimum thickness 0.040 inch.
- B. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.

- 1. Finish: No. 2D (dull, cold rolled).
- 2. Through-wall: Minimum 0.0156 inch thick.

2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 3. Blind Fasteners: High-strength stainless-steel rivets.
- C. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Available Manufacturers:
 - 1. Fry Reglet Corporation.
 - a. Heckmann Building Products Inc.
 - b. Hickman, W. P. Company.
 - c. Keystone Flashing Company, Inc.
 - d. Sandell Manufacturing Company, Inc.
 - e. Tremco Inc.
 - 2. Material: Stainless steel, 0.0187 inch thick.
 - 3. 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.
 - 4. Masonry Type: Provide with top flange to set in mortar joint; bent leg to resist pull-out.
 - 5. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application but not less than thickness of metal being secured.

2.5 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12 foot long, sections, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2-inch- high end dams. Fabricate from the following material:
 - 1. Stainless Steel: 0.0156 inch thick.

2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION, GENERAL
 - A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Torch cutting of sheet metal flashing and trim is not permitted.
 - B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
 - 1. Coat side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 - 2. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
 - C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 - D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
 - F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 - G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
 - 1. Aluminum: Use aluminum or stainless-steel fasteners.
 - 2. Stainless Steel: Use stainless-steel fasteners.
 - H. Seal joints sealant as required for watertight construction.
 - 1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting proportionately for

installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.

- 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."
- I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.
 - 1. Do not solder prepainted, metallic-coated steel and aluminum sheet.
 - 2. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
 - 3. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.
- J. Aluminum Flashing: Rivet or weld joints in uncoated aluminum where necessary for strength.
- 3.3 WALL FLASHING INSTALLATION
 - A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- 3.4 CLEANING AND PROTECTION
 - A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
 - B. Clean and neutralize flux materials. Clean off excess solder and sealants.
 - C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
 - D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

SECTION 07 71 00 - MANUFACTURED ROOF SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following manufactured roof specialties:
 - 1. Copings.
 - 2. Roof edge flashings.
 - 3. Prefabricated through wall scupper.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Manufacture and install manufactured roof specialties to resist thermally induced movement and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. FMG Listing: Manufacture and install copings and roof edge flashings that are listed in FMG's "Approval Guide" and approved for Windstorm Classification; Wind Zone 2 ratings. Identify materials with FMG markings.
 - 1. FM tested and approved means of fastening.
- C. Thermal Movements: Provide manufactured roof specialties that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Water Infiltration: Provide manufactured roof specialties that do not allow water infiltration to building interior.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Qualification data for manufacturer and qualified professional engineer licensed in the State of Maryland.
- C. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer (licensed in Maryland); show layouts of manufactured roof specialties, including plans and elevations. Identify factory- vs. field-assembled work. Include the following:
 - 1. Details for fastening, joining, supporting, and anchoring manufactured roof specialties including fasteners, clips, cleats, and attachments to adjoining work.
 - 2. Details for expansion and contraction.
- D. Fabrication Samples: For copings and roof edge flashings made from 12-inch lengths of full-size components including fasteners, cover joints, accessories, and attachments.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, verifying compliance of copings and roof edge flashings with performance requirements.
- F. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. 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. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- B. Manufacturer Qualifications: Manufacturer capable of providing engineering and field service representation during construction.
 - 1. Engineering Responsibility: Preparation of data for including the following:
 - a. Shop Drawings and comprehensive engineering analysis by a qualified professional engineer licensed in the State of Maryland.
 - 2. Company with a minimum of ten years of continuous experience manufacturing perimeter metal systems of the type specified and capable of providing the following information.
 - 3. List of five other projects of similar size, including approximate date of installation and name of architect for each.
- C. Product Qualifications: Products must be accepted by roofing manufacturer within the total system warranty and listed by name on the roofing manufacturer's letterhead, as described under submittals for Section 07 54 00.10 and 07 54 00.20.
- 1.5 COORDINATION
 - A. Coordinate installation of manufactured roof specialties with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.
- 1.6 WARRANTY
 - A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace manufactured roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
 - B. Special Warranty for Wind Resistance:
 - 1. Manufacturer shall guarantee that a standard size roof edge system, when installed per manufacturer's instructions, will not blow off, leak, or cause membrane failure, even in wind conditions up to 110 mph, or the manufacturer shall at their option repair or replace their materials.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

- 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
- 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- 3. Basis-of-Design Product: The designs for copings and roof edge flashings are based on the products named. Subject to compliance with requirements, provide either the named products or comparable products by one of the other manufacturers specified.

2.2 EXPOSED METALS

- A. Aluminum Sheet: ASTM B 209, alloy and temper recommended by manufacturer for use and finish indicated, finished as follows:
 - 1. Surface: Smooth, flat finish.
 - 2. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Exterior Finish: Fluoropolymer 2-Coat Coating System Manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
 b) Color: Match Ambitathe samela
 - 1) Color: Match Architect's sample.
- B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:
 - 1. High-Performance Organic 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 manufacturers' written instructions.
 - a. Exterior Finish: Fluoropolymer 3-Coat Coating System Manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
 1) Color: Match Architect's sample.

2.3 CONCEALED METALS

- A. Aluminum Sheet: ASTM B 209, alloy and temper recommended by manufacturer for use and structural performance indicated, mill finished.
- B. Aluminum Extrusions: ASTM B 221, alloy and temper recommended by manufacturer for type of use and structural performance indicated, mill finished.
- C. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, separators, sealants, and other miscellaneous items required by manufacturer for a complete installation.

- B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to withstand design loads.
 - 1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
- C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.5 COPINGS

- A. Copings: Manufactured coping system consisting of formed-metal coping cap in section lengths not exceeding 12 feet, concealed anchorage, concealed splice plates with same finish as coping caps, one-piece corner units, and end cap units.
 - 1. Available Products Typical:
 - a. Permasnap by Hickman, W. P. Company.
 - b. PerformaEdge Coping by Imetco.
 - c. Perma-Tite Coping by Metal-Era.
 - d. Roofing Manufacturer.
 - 2. Basis-of-Design Product Special Profiles: Refer to Drawings for custom profile.
 - a. Profile by Hickman, W. P. Company.
 - b. PerformaEdge (Custom) Coping by Imetco.
 - 3. Coping Caps: Snap-on, fabricated from the following exposed metal: a. Aluminum: 0.063 inch thick.
 - 4. Coping Cap Color: Match Architect's sample.
 - 5. Corners: Continuously welded; field verify actual constructed angles for factory-fabricated project-specific prefabricated corners.
 - 6. Transitions: Provide project-specific factory-fabricated continuously welded transitions including, but not limited to, transition miters, "z"-miters (steps in exterior wall 18 inches or less), tee miters, end terminations and end caps.
 - 7. Snap-on Coping Anchor Plates: Concealed, galvanized steel sheet, 12 inches wide, 0.028 inch thick, with integral cleats.
 - 8. Face Leg Cleats: Concealed, continuous galvanized steel sheet.

2.6 ROOF EDGE FLASHINGS

- A. Canted Roof Edge Fascia: Manufactured, two-piece, roof edge fascia consisting of snap-on compression-clamped metal fascia cover in section lengths not exceeding 12 feet and a continuous formed galvanized steel sheet cant dam, 0.028 inch thick, minimum, with integral drip edge cleat.
 - 1. Available Products Typical:
 - a. Safeguard NP by Hickman, W. P. Company.
 - b. PerformaEdge Fascia by Imetco.
 - c. System 300 Perma-Tite Fascia by Metal-Era.
 - d. Roofing Manufacturer.
 - 2. Basis-of-Design Product Special Profiles: Refer to Drawings for custom profile.

- a. Profile by Hickman, W. P. Company.
- b. PerformaEdge (Custom) Fascia by Imetco.
- 3. Fascia Cover: Fabricated from the following exposed metal:
 - a. Aluminum:
 - 1) Typical: Minimum 0.063 inch thick.
 - 2) Special Profiles: Minimum 0.063 inch thick.
- 4. Fascia Cover Color: Match Architect's sample.
- 5. Provide matching mitered and welded corner units; field verify actual constructed angles for factory-fabricated project-specific prefabricated corners.
- 6. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.

2.7 THROUGH-WALL SCUPPERS

- A. Prefabricated box scupper with flush conductor head, formed from minimum 0.063 inch thick aluminum.
- B. Fabrication:
 - 1. Welded construction.
 - 2. Conductor box design to provide a 3 inch wide front frame (box full width of outside front frame edges); backside picture frames to be 3 inches and shipped loose.
 - 3. 3 inch slotted nailing flange for anchoring to roof deck.
 - 4. Basis-of-Design Product: Thru-Wall Scupper by Metal-Era, Inc. or a comparable product by perimeter metal manufacturer.
 - 5. Color to match Architect's sample.

2.8 PREFABRICATED ROOF EXPANSION JOINT COVER

- A. Basis-of-Design: Roof toRoof Expansion Joint by W.P. Hickman.
- B. Other Acceptable Manufacturers:
 - 1. Metal Era.
 - 2. Imetco.
- C. Characteristics:
 - 1. Formed metal cap; concealed joint cover and gutter chair.
 - 2. 20 gage stailness steel articulating cleat.
 - 3. Predrilled for shouldered fasteners 18 inches o.c. on both curbs.
 - 4. Provide with in-joint condensate seal and insulation.

2.9 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of work.
 - 1. Examine walls, roof edges, and parapets for suitable conditions for manufactured roof specialties.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install manufactured roof specialties according to manufacturer's written instructions. Anchor manufactured roof specialties securely in place and capable of resisting forces specified in performance requirements. Use fasteners, separators, sealants, and other miscellaneous items as required to complete manufactured roof specialty systems.
 - 1. Install manufactured roof specialties with provisions for thermal and structural movement.
 - 2. Torch cutting of manufactured roof specialties is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
- C. Install manufactured roof specialties level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil-canning, buckling, or tool marks.
- D. Install manufactured roof specialties to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
- E. Expansion Provisions: Provide for thermal expansion of exposed manufactured roof specialties. Space movement joints at a maximum of 12 feet with no unplanned joints within 18 inches of corners or intersections.
- F. Fasteners: Use fasteners of type and size recommended by manufacturer but of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- G. Seal joints with elastomeric sealant as required by manufacturer of roofing specialties.

3.3 COPING INSTALLATION

- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor copings to resist uplift and outward forces according to performance requirements.
 - 1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's recommended spacing.

3.4 ROOF EDGE FLASHING INSTALLATION

- A. Install cleats, cant dams, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings to resist uplift and outward forces according to performance requirements.

3.5 CLEANING AND PROTECTION

- A. Clean off excess sealants.
- B. Remove temporary protective coverings and strippable films as manufactured roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings and pieces of flashing. Maintain in a clean condition during construction.
- C. Replace manufactured roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

SECTION 07 71 23 - CONDUCTOR HEADS AND DOWNSPOUTS

PART1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Pre-fabricated aluminum conductor heads, gutters, and downspouts.
- B. Related Sections include the following:
 - 1. Division 7 Section "Sheet Metal Flashing and Trim" for flashings and other sheet metal work.
 - 2. Division 7 Section "Manufactured Roof Specialties" for fasciae and copings.
 - 3. Division 7 Section "Metal Roof Panels" for metal roofing systems.
 - 4. Division 7 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

1.2 REFERENCES

- A. American Architectural Manufacturers Association:
 - 1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.
 - 2. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International: ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- C. Federal Specification Unit: FS TT-C-494 Coating Compound, Bituminous, Solvent Type, Acid Resistant.
- D. Sheet Metal and Air Conditioning Contractors' National Association, Inc.: SMACNA Architectural Sheet Metal Manual.
- 1.3 SUBMITTALS
 - A. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
 - B. Product Data: Submit data on manufactured components, materials, and finishes.
 - C. Samples: Submit two samples, 24 inches long illustrating component design, finish, color, and configuration.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA Manual; maintain one copy of manual on site.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Stack products to prevent twisting, bending, and abrasion, and to provide ventilation; slope to drain.
 - B. Prevent contact with materials during storage capable of causing discoloration, staining, or damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers:
 - 1. Berger Building Products Corp.

- 2. Metal-Era.
- 3. W.P. Hickman Company.
- B. Product Description:
 - 1. Gutters: SMACNA Rectangular style profile; Figure 1-2, Style F.
 - 2. Conductor Heads: As indicated on the drawings.
 - 3. Downspouts: SMACNA round profile; Figure 1-32A.

2.2 COMPONENTS

- A. Pre-Finished Aluminum Sheet:
 - 1. ASTM B209, manufacturer's standard alloy and temper for specified finish; shop pre-coated with three coat PVDF (polyvinylidene fluoride) coating.
 - a. Conductor Heads and Downspouts: 0.050 inch thick.
 - 2. Color: Match Architect's sample.

2.3 ACCESSORIES

- A. Anchors and Supports: Profiled to suit gutters and downspouts.
 - 1. Anchoring Devices: In accordance with SMACNA requirements.
 - 2. Gutter Supports: Brackets and straps sized per SMACNA Table 1-8.
 - 3. Downspout Supports Typical: Brackets; SMACNA Figure 1-35E.
- B. Strainers: 15 gage stainless steel wire baskets.
- C. Fasteners: Aluminum or Stainless steel, with EPDM washers.
- D. Protective Backing Paint: FS TT-C-494, Bituminous.

2.4 FABRICATION

- A. Form gutters and downspouts of profiles and sizes indicated.
- B. Fabricate with required connection pieces.
- C. Form sections to shape indicated on Drawings, square, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance; allow for expansion at joints.
- D. Hem exposed edges of metal.
- E. Fabricate conductor heads and downspout accessories; seal watertight.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify surfaces are ready to receive conductor heads and downspouts.

3.2 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mils.

3.3 INSTALLATION

- A. Join lengths with formed seams sealed watertight.
- B. Support Spacing:
 - 1. Gutters:
 - a. Brackets: 36 inch o.c.
 - b. Straps: 36 inch o.c. offset 18 inches o.c. of bracket locations.

- 2. Downspouts: SMACNA Figure 1-35.
- C. Flash and seal gutters to downspouts and accessories.
- D. Slope gutters minimum 1/16 inch per foot.
- E. Provide gutter slip joints every 20 feet in length for contraction and expansion; seal joints with sealant of matching color.
- F. Set downspouts plumb and not less than 1 inch from the wall.
- G. Provide leaders to connect gutters on overhanging eaves to downspouts; set leaders with a slope not less than 1/16 inch per foot or more than 30 degrees below a horizontal line.
- H. Fit leaders over the outlet tube in gutter bottom riveted to the downspout; rivet spacing shall be not more than 2 inches.
- I. Set strainers loosely in the outlet tube opening in downspouts.
- J. Make joints between lengths of downspouts by telescoping the end of the upper lengths at least 3/4 inch into the lower length.

SECTION 07 72 00 - ROOF ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Roof curbs.
 - 2. Equipment supports.
 - 3. Roof hatches.
 - 4. Ladder safty post.

1.2 SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details for roof accessories. Show layouts of roof accessories including plans and elevations. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other work.
- C. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.

1.3 QUALITY ASSURANCE

A. Sheet Metal Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Pack, handle, and ship roof accessories properly labeled in heavy-duty packaging to prevent damage.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify required openings for each type of roof accessory by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

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, manufacturers listed in other Part 2 articles.

2.2 METAL MATERIALS

- A. Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by hot-dip process and prepainted by coil-coating process to comply with ASTM A 755.
 - 1. Galvanized Steel Sheet: ASTM A 653, G90 coated.
 - 2. Exposed Finishes:
 - a. Roof Curbs, Equipment Curbs and Pipe Supports: Manufacturer's standard powder coat.
 - b. Roof Hatches and Vents: Manufacturer's standard powder coat.
- B. Steel Shapes: ASTM A 36, hot-dip galvanized to comply with ASTM A 123, unless otherwise indicated.

2.3 MISCELLANEOUS MATERIALS

- A. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than 1-1/2 inches thick.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- C. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by roof accessory manufacturer. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.
- D. Gaskets: Manufacturer's standard tubular or fingered design of EPDM, or PVC; or flat design of foam rubber.
- E. Elastomeric Sealant: ASTM C 920, polyurethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

2.4 ROOF CURBS

- A. Roof Curbs: Provide metal roof curbs, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Fabricate with welded or sealed mechanical corner joints, with stepped integral metal cant raised the thickness of roof insulation and integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
 - 1. Available Manufacturers:
 - a. Custom Curb, Inc.
 - b. LM Curbs.
 - c. Pate Company (The).
 - d. Roof Products & Systems Corporation.
 - e. Roof Products, Inc.
 - f. ThyCurb; Div. of Thybar Corporation.
 - g. Tremco, Inc.
 - 2. Load Requirements: Indicated on Drawings.
 - 3. Material: Galvanized steel sheet, 14 gage thick. a. Finish: High-performance organic coating.
 - 4. Liner: Same material as curb, of manufacturer's standard thickness and finish.
 - 5. Factory install wood nailers at tops of curbs.

- 6. Factory insulate curbs with 1-1/2-inch thick, glass-fiber board insulation.
- 7. Curb height may be determined by adding thickness of roof insulation and minimum base flashing height recommended by roofing membrane manufacturer. Fabricate units to minimum height of 10 inches, unless otherwise indicated.
- 8. Sloping Roofs: Where slope of roof deck exceeds 1:48, fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.

2.5 EQUIPMENT SUPPORTS

- A. Equipment Supports: Provide metal equipment supports, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported. Fabricate with welded or sealed mechanical corner joints, with stepped integral metal cant raised the thickness of roof insulation and integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
 - 1. Available Manufacturers:
 - a. Custom Curb, Inc.
 - b. LM Curbs.
 - c. Pate Company (The).
 - d. Roof Products & Systems Corporation.
 - e. Roof Products, Inc.
 - f. ThyCurb; Div. of Thybar Corporation.
 - g. Tremco, Inc.
 - 2. Load Requirements: Indicated on Drawings.
 - 3. Material: Galvanized steel sheet, 14 gage thick.
 - a. Finish: High-performance organic coating.
 - 4. Factory-install continuous wood nailers at tops of equipment supports.
 - 5. Metal Counterflashing: Manufacturer's standard removable counterflashing, fabricated of same metal and finish as equipment support.
 - 6. Fabricate units to minimum height of 12 inches, unless otherwise indicated.
 - 7. Sloping Roofs: Where slope of roof deck exceeds 1:48, fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.

2.6 ROOF HATCHES

- A. Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated curb frame with integral deck mounting flange and lid frame counterflashing. Fabricate with welded or mechanically fastened and sealed corner joints. Provide continuous weathertight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.
 - 1. Performance:
 - a. To withstand minimum 40-lbf/sq. ft. external pressure.
 - b. 20-lbf/sq. ft. internal loading pressure.
 - 2. Available Manufacturers:
 - a. Babcock-Davis; a Cierra Products Inc. Company; Model B-RHG.
 - b. Bilco Company (The); Type L.
 - c. J. L. Industries, Inc.; Model RHG-3.
 - d. Nystrom, Inc.; Model RHG.
 - 3. Curb and Lid Material: Galvanized steel sheet, minimum 14 gage thick.
 - 4. Insulation: Glass-fiber board.

- 5. Interior Lid Liner: Manufacturer's standard metal liner of same material and finish as outer metal lid.
- 6. Exterior Curb Liner: Manufacturer's standard metal liner of same material and finish as metal curb.
- 7. Formed cants and cap flashing (roofing counterflashing) with welded or sealed mechanical corner joints.
- 8. Fabricate units to minimum height of 12 inches, unless otherwise indicated.
- 9. Hardware: Stainless-steel spring latch with turn handles, butt or pintle-type hinge system, and padlock hasps inside and outside.
 - a. Provide 2-point latch on covers larger than 84 inches.
- 10. Modify hatch cover to incorporate 24 inch, 1-1/4-inch Schedule 40 pipe handrail mounted on underside of door; set handrail at angle to match alternating steel stair to hatch.

2.7 LADDER SAFETY POST

- A. Furnish and install at all roof hatch ladders a ladder safety post. The ladder safety post shall be pre-assembled from the manufacturer.
 - 1. Basis-of-Design: Bilco Model LU-1.
- B. Performance characteristics:
 - 1. Tubular post shall lock automatically when fully extended.
 - 2. Safety post shall have controlled upward and downward movement.
 - 3. Release lever shall disengage the post to allow it to be returned to its lowered position.
 - 4. Post shall have adjustable mounting brackets to fit ladder rung spacing up to 14" on center and clamp brackets to accommodate ladder rungs up to 1-3/4" in diameter.
- C. Post: Shall be manufactured of high strength square tubing. A pull up loop shall be provided at the upper end of the post to facilitate raising the post.
- D. Material of construction: Shall be steel.
- E. Balancing spring: A stainless steel spring balancing mechanism shall be provided to provide smooth, easy, controlled operation when raising and lowering the safety post.
- F. Hardware: All mounting hardware shall be Type 316 stainless steel.
- G. Finishes: Factory finish shall be yellow powder coat.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored and is ready to receive roof accessories.
 - 2. Verify dimensions of roof openings for roof accessories.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.

- B. Install roof accessories to fit substrates and to result in watertight performance.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Underlayment: Where installing exposed-to-view components of roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene underlayment.
 - 2. Bed flanges in thick coat of asphalt roofing cement where required by roof accessory manufacturers for waterproof performance.
- D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
- E. Roof Curb Installation: Set roof curb so top surface of roof curb is level.
- F. Equipment Support Installation: Set equipment support so top surface of equipment support is level.
- G. Roof Hatch Installation:
 - 1. Check roof hatch for proper operation.
 - 2. Adjust operating mechanism as required.
 - 3. Clean and lubricate joints and hardware.
- H. Seal joints with elastomeric sealant as required by manufacturer of roof accessories.

3.3 CLEANING

A. Clean exposed surfaces according to manufacturer's written instructions.

SECTION 07 81 00 - APPLIED FIREPROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fireproofing of interior structural steel.

1.2 REFERENCE STANDARDS

- A. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- B. ASTM E605 Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 1993 (Reapproved 2011).
- C. ASTM E736 Standard Test Method For Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2000 (Reapproved 2011).
- D. ASTM E760 Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members; 1992 (Reapproved 2011).
- E. ASTM E761 Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members; 1992 (Reapproved 2011).
- F. ASTM E937 Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 1993 (Reapproved 2011).

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data indicating product characteristics.
- C. Shop Drawings: Structural framing plans indicating the following:
 - 1. Locations and types of surface preparations required before applying sprayed fire-resistive material.
 - 2. Extent of sprayed fire-resistive material for each construction and fire-resistance rating, including the following:
 - a. Applicable fire-resistive design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
 - b. Minimum thicknesses needed to achieve required fire-resistance ratings of structural components and assemblies.
 - c. Designation of restrained and unrestrained conditions based on definitions in ASTM E 119, Appendix X3 as determined by a qualified professional engineer.
 - 3. Treatment of sprayed fire-resistive material after application.
- D. Test Reports: Reports from reputable independent testing agencies for proposed products, indicating compliance with specified criteria, conducted under conditions similar to those on project, for:
 - 1. Bond Strength.
 - 2. Bond Impact.
 - 3. Compressive Strength.
 - 4. Fire tests using substrate materials similar those on project.
- E. Manufacturer's Certificate: Certify that sprayed-on fireproofing products meet or exceed requirements of contract documents.
- F. LEED Submittals:

- 1. Credit EQ 4.1: Documentation of VOC content for adhesives and sealants applied within the waterproofing envelope.
- 2. Credit EQ 4.2: Documentation of VOC content for paints or coatings applied within the waterproofing envelope.
- 3. Credit MR 4: Documentation indicating percentages by weight of postconsumer and preconsumer recycled content; include statement indicating cost of each product having recycled content.
- G. Manufacturer's Field Reports: Indicate environmental conditions under which fireproofing materials were installed.

1.4 FIELD CONDITIONS

- A. Do not apply spray fireproofing when temperature of substrate material and surrounding air is below 40 degrees F or when temperature is predicted to be below said temperature for 24 hours after application.
- B. Provide ventilation in areas to receive fireproofing during application and 24 hours afterward, to dry applied material.
- C. Provide temporary enclosure to prevent spray from contaminating air.

1.5 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
 - 1. Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering.
 - 2. Reinstall or repair failures that occur within warranty period.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Carboline Company: www.carboline.com.
 - 1. Concealed Applications: Pyrolite 15.
 - 2. Exposed Applications: Pyrocrete 22.
- B. Grace Construction Products: www.na.graceconstruction.com.
 - 1. Concealed Applications: Monokote Type MK-6/CBF.
 - 2. Exposed Applications: Monokote Type Z106.
- C. Isolatek International Inc: www.isolatek.com.
 - 1. Concealed Applications: Cafco 300.
 - a. Contractor Option: Cafco Blaze-Shield II.
 - 2. Exposed Applications: Cafco 400.
 - a. Contractor Option: Cafco Blaze-Shield HP.

2.2 FIREPROOFING ASSEMBLIES

- 2.3 MATERIALS
 - A. Sprayed Fire-Resistive Material for Interior Applications: Manufacturer's standard factory mixed material, which when combined with water is capable of providing the indicated fire resistance, and conforming to the following requirements:
 - 1. Bond Strength: 200 psf, minimum, when tested in accordance with ASTM E736 when set and dry.

- 2. Compressive Strength: 850 pounds per square inch, minimum.
- 3. Effect of Impact on Bonding: No cracking, spalling or delamination, when tested in accordance with ASTM E760.
- 4. Corrosivity: No evidence of corrosion, when tested in accordance with ASTM E937.
- 5. Surface Burning Characteristics: Maximum flame spread of 0 and maximum smoke developed of 0, when tested in accordance with ASTM E84.
- B. Provide UL fire-rated assemblies to hourly ratings as follows:
 - 1. Interior columns: 2 hours.
 - 2. Interior girders: 2 hours.
 - 3. Interior floors: 2 hours.
 - 4. Interior roof deck: 2 hours.

2.4 MATERIALS

- A. Low Density Sprayed Fire-Resistive Material: Factory mixed, cementitious material blended for uniform texture with vermiculite or lightweight synthetic aggregate, and conforming to the following requirements:
 - 1. Bond Strength: ASTM E 736, 200 psf when set and dry.
 - 2. Bond Impact: ASTM E 760, no cracking, flaking or delamination.
 - 3. Dry Density: ASTM E 605, minimum average density of 14 lb/cu ft, with minimum individual density of any test sample of 13 lb/cu ft.
 - 4. Compressive Strength: ASTM E 761, minimum 7.0 psi.
 - 5. Surface Burning Characteristics: Maximum flame spread of 0 and maximum smoke developed of 0, when tested in accordance with ASTM E 84.
 - 6. Location: Concealed locations.
- B. Medium Density Sprayed Fire-Resistive Material: Factory mixed, Portland cement blended for uniform texture with mineral aggregates or mineral fibers and additives, without chlorides, approved for exterior use and conforming to the following requirements:
 - 1. Location: Exposed interior locations.

2.5 ACCESSORIES

- A. Primer Adhesive: Of type recommended by fireproofing manufacturer; comply with low-emitting requirements specified in Section 01 61 16.
- B. Overcoat: As recommended by manufacturer of fireproofing material.
- C. Metal Lath: Expanded metal lath; 3.4 lb/sq ft, galvanized finish.
- D. Water: Clean, potable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive fireproofing.
- B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
- C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.
- D. Verify that voids and cracks in substrate have been filled. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

3.2 PREPARATION

- A. Perform tests as recommended by fireproofing manufacturer in situations where adhesion of fireproofing to substrate is in question.
- B. Remove incompatible materials that could affect bond by scraping, brushing, scrubbing, or sandblasting.
- C. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.
- D. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.
- E. Close off and seal duct work in areas where fireproofing is being applied.

3.3 APPLICATION

- A. Install metal lath over structural members as indicated or as required by UL Assembly Design Numbers.
- B. Apply primer adhesive in accordance with manufacturer's instructions.
- C. Apply fireproofing in thickness and density necessary to achieve required ratings, with uniform density and texture.
- D. Apply fireproofing in sufficient thickness to achieve required ratings, with as many passes as necessary to cover with monolithic blanket of uniform density and texture.
- E. In exposed locations, trowel surface smooth and form square edges, using tools and procedures recommended by fireproofing manufacturer.

3.4 FIELD QUALITY CONTROL

- A. Provide independent third-party inspection of the installed fireproofing after application and curing for integrity, prior to its concealment. Ensure that actual thicknesses, densities, and bond strengths meet requirements for specified ratings. Perform testing in accordance with IBC 1705.13.
- B. Independent third-party inspector to re-inspect the installed fireproofing for integrity of fire protection, after installation of subsequent Work.
- C. Repair or replace any damaged areas of fireproofing.
- 3.5 CLEANING
 - A. Remove excess material, overspray, droppings, and debris.
 - B. Remove fireproofing from materials and surfaces not required to be fireproofed.
 - C. At exposed fireproofing, clean surfaces that have become soiled or stained, using manufacturer's recommended procedures.

SECTION 07 84 00 - FIRESTOPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.
- C. Smoke seals.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions.
- 1.3 REFERENCE STANDARDS
 - A. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials; 2012.
 - B. ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2011a.
 - C. ITS (DIR) Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
 - D. FM 4991 Approval of Firestop Contractors; Factory Mutual Research Corporation; 2001.
 - E. FM P7825 Approval Guide; Factory Mutual Research Corporation; current edition.
 - F. UL (FRD) Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. LEED Report: Submit VOC content documentation for all adhesives, sealants and primers.1. Comply with VOC content limits of Section 01 61 16.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Qualification statements for installing mechanics.

1.5 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the specified fire ratings when tested in accordance with ASTM E 814 and ASTM E 119.
 - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
 - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
- B. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors, or meeting any two of the following requirements:.
 - 2. With minimum 3 years documented experience installing work of this type.
 - 3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
 - 4. Approved by firestopping manufacturer.

C. Installing Mechanic's Qualifications: Trained by firestopping manufacturer and able to provide evidence thereof.

1.6 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.1 FIRESTOPPING SYSTEMS

- A. F-Rated (Flame Rated) Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated as determined per ASTM E814, UL 1479 but not less than that equaling or exceeding the fire resistance rating of the construction penetrated.
- B. T-Rated (Temperature Rated) Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas; T-rated assemblies are required where specified by codes or where the following conditions exist:
 - 1. Where firestop systems protect penetrations located outside of wall cavities.
 - 2. Where firestop systems protect penetrations located outside fire resistive shaft enclosures.
 - 3. Where firestop systems protect penetrations located in construction containing doors required to have a temperature rise rating.
 - 4. Where firestop systems protect penetrating items larger than a 4 inch diameter nominal pipe or 16 square inches in overall cross sectional area.
- C. Fire Resistive Joint Sealants: Provide joint sealants with fire resistance ratings indicated, as determined per UL 2079 or (ASTM E1399, E1966 and E2307), but not less than that equaling or exceeding the fire resistance rating of the construction in which the joint occurs. VOC Content not to exceed 250 g/L.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.3 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.
- C. Install labelling required by code.

3.4 FIELD QUALITY CONTROL

- A. Provide independent third-party inspection of the installed firestopping after application and prior to its concealment.
- B. Repair or replace any damaged areas of firestopping.

3.5 PROTECTION

- A. Clean adjacent surfaces of firestopping materials.
- B. Protect adjacent surfaces from damage by material installation.

SECTION 07 84 46 - FIRE-RESISTIVE JOINT SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes fire-resistive joint systems for the following:
 - 1. Floor-to-floor joints.
 - 2. Floor-to-wall joints.
 - 3. Head-of-wall joints.
 - 4. Wall-to-wall joints.
 - 5. Perimeter fire-resistive joint systems consisting of floor-to-wall joints between perimeter edge of fire-resistance-rated floor assemblies and exterior curtain walls.
 - 6. Smoke seals.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide fire-resistive joint systems that are 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 assembly in which fire-resistive joint systems are installed.
- B. Joint Systems in and between Fire-Resistance-Rated Constructions: Provide systems with assembly ratings equaling or exceeding the fire-resistance ratings of construction that they join, and with movement capabilities indicated as determined by UL 2079.
- C. Perimeter Fire-Resistive Joint Systems: For joints between edges of fire-resistance-rated floor assemblies and exterior curtain walls, provide systems of type and with ratings indicated below and those indicated on Drawings, as determined by NFPA 285 and UL 2079.
 - 1. UL-Listed, Perimeter Fire-Containment Systems: Integrity ratings equaling or exceeding fire-resistance ratings of floor or floor/ceiling assembly forming one side of joint.
- D. For fire-resistive systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each fire-resistive joint system, show each kind of construction condition in which joints are installed; also show relationships to adjoining construction. Include fire-resistive joint system design designation of testing and inspecting agency acceptable to authorities having jurisdiction that demonstrates compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each fire-resistive joint system configuration for construction and penetrating items.
- C. Product Certificates: For each type of fire-resistive joint system, signed by product manufacturer.
- D. Qualification Data: For Installer.
- E. LEED Submittals:
 - 1. Credit EQ 4.1: Manufacturers' product data for interior sealants, including printed statement of VOC content in g/L.

1.4 QUALITY ASSURANCE

- A. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- B. Source Limitations: Obtain fire-resistive joint systems, for each kind of joint and construction condition indicated, through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide fire-resistive joint systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 - 1. Fire-resistance tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for fire-resistive joint systems acceptable to authorities having jurisdiction.
 - 2. Fire-resistive joint systems are identical to those tested per methods indicated in Part 1 "Performance Requirements" Article and comply with the following:
 - a. Fire-resistive joint system products bear classification marking of qualified testing and inspecting agency.
 - b. Fire-resistive joint systems correspond to those indicated by referencing system designations of the qualified testing and inspecting agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fire-resistive joint system products to Project site in original, unopened containers or packages with qualified testing and inspecting agency's classification marking applicable to Project and with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials for fire-resistive joint systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate fire-resistive joint systems per manufacturer's written instructions by natural means or, if this is inadequate, forced-air circulation.
- C. VOC content not to exceed 250 g/L.

1.7 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify Owner's inspecting agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up fire-resistive joint system installations that will become concealed behind other construction until Owner's inspecting agency and building inspector of authorities having jurisdiction have examined each installation.

PART 2 PRODUCTS

2.1 FIRE-RESISTIVE JOINT SYSTEMS

- A. Compatibility: Provide fire-resistive joint systems that are compatible with joint substrates, under conditions of service and application, as demonstrated by fire-resistive joint system manufacturer based on testing and field experience.
- B. Accessories:
 - 1. Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article.
 - 2. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing and inspecting agency for systems indicated.
 - 3. Holding Clips: Minimum 30 gage by 1 inch wide galvanized sheet steel Z-shaped clips to support safing insulation.

2.2 SLAG-WOOL-FIBER/ROCK-WOOL-FIBER BOARD INSULATION

- A. Available Manufacturers:
 - 1. Fibrex Insulations Inc.
 - 2. Owens Corning.
 - 3. Thermafiber.
- B. Unfaced, Slag-Wool-Fiber/Rock-Wool-Fiber Board Insulation: ASTM C 612, maximum flame-spread and smoke-developed indexes of 15 and 0, respectively; passing ASTM E 136 for combustion characteristics.
 - 1. Nominal minimum density of 4 lb/cu. ft.
 - 2. Fiber Color: Regular color, unless otherwise indicated.
 - 3. Fiber Color: Darkened, where indicated.
 - 4. Uses: Where indicated and as fire safing insulation.
- C. Foil-Faced, Slag-Wool-Fiber/Rock-Wool-Fiber Board Insulation: ASTM C 612; faced on 1 side with foil-scrim or foil-scrim-polyethylene vapor retarder; with maximum flame-spread and smoke-developed indexes of 25 and 5.
 - 1. Nominal minimum density of 4 lb/cu. ft.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of work.
 - 1. Proceed with installatin only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. 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 fire-resistive joint system 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 fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from fire-resistive joint system materials. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates or damaging adjoining surfaces.
- 3.3 INSTALLATION
 - A. General: Install fire-resistive joint systems to comply with Part 1 "Performance Requirements" Article and fire-resistive joint system manufacturer's written installation instructions for products and applications indicated.
 - B. Install forming/packing/backing materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings and forming/packing/backing materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply fill materials so they contact and adhere to substrates formed by joints.
 - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner may engage a qualified independent inspecting agency to inspect fire-resistive joint systems and prepare inspection reports.
- B. Testing Services: Inspecting of completed installations of fire-resistive joint systems shall take place in successive stages as installation of fire-resistive joint systems proceeds. Do not proceed with installation of joint systems for the next area until inspecting agency determines completed work shows compliance with requirements.
 - 1. Inspecting agency shall state in each report whether inspected fire-resistive joint systems comply with or deviate from requirements.
- C. Remove and replace fire-resistive joint systems where inspections indicate that they do not comply with specified requirements.
- D. Additional inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and fire-resistive joint systems comply with requirements.

3.5 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to joints as Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

SECTION 07 90 05 - JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions.

1.3 REFERENCE STANDARDS

- A. ASTM C834 Standard Specification for Latex Sealants; 2010.
- B. ASTM C919 Standard Practice for Use of Sealants in Acoustical Applications; 2012.
- C. ASTM C920 Standard Specification for Elastomeric Joint Sealants; 2014.
- D. ASTM C1193 Standard Guide for Use of Joint Sealants; 2013.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- 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- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- E. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- F. Qualification Data: For Installer.
- G. LEED Report: Submit VOC content documentation for all non-preformed sealants and primers.

1.5 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.6 COORDINATION

A. Coordinate the work with all sections referencing this section.

1.7 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.
- D. Products shall be provided with manufacturer's maximum warranty period offered for each product listed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Gunnable and Pourable Sealants:
 - 1. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 - 2. Bostik Inc: www.bostik-us.com.
 - 3. Dow Corning Corporation: www.dowcorning.com.
 - 4. Hilti, Inc: www.us.hilti.com.
 - 5. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
 - 6. Pecora Corporation: www.pecora.com.
 - 7. Red Devil: www.reddevil.com.
 - 8. Tremco Global Sealants: www.tremcosealants.com.
 - 9. Sherwin-Williams Company: www.sherwin-williams.com.
 - 10. W.R. Meadows, Inc: www.wrmeadows.com.
 - 11. GE Silicones.
- B. Preformed Compressible Foam Sealers:
 - 1. EMSEAL Joint Systems, Ltd: www.emseal.com.
 - 2. Sandell Manufacturing Company, Inc: www.sandellmfg.com.
 - 3. Dayton Superior Corporation: www.daytonsuperior.com.
- 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:
 - 1. As selected by Architect from manufacturer's full range.
 - 2. Allow custom colors for masonry joints.
 - 3. Allow for four custom exterior custom colors including masonry joints.
 - C. Comply with low-emitting requirements specified in Section 01 61 16.

2.3 SEALANTS

- A. Sealants and Primers General: Provide products having volatile organic compound (VOC) content as specified in Section 01 61 16.
- B. Type LS-1 General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
 - 1. Color: Standard colors matching finished surfaces.
- C. Type AS-1 Acoustical Sealant for Concealed Locations:
 - 1. Composition: Permanently tacky non-hardening butyl sealant.
 - 2. Applications: Use for concealed locations only:
 - a. Sealant bead between top stud runner and structure and between bottom stud track and floor.
 - b. Sealant between acoustical ceiling perimeter track and wall.
- D. Single-Component Neutral- and Basic-Curing Silicone Sealant ES-1:
 - 1. Products:
 - a. Dow Corning Corporation; 790.
 - b. Tremco; Spectrem 1 (Basic).

- c. GE Silicones; SilPruf SCS2000.
- d. Pecora Corporation; 864.
- e. Polymeric Systems Inc.; PSI-641.
- f. Sonneborn, Division of ChemRex Inc.; Omniseal.
- 2. Type and Grade: S (single component) and NS (nonsag).
- 3. Class: 100/50.
- 4. Use Related to Exposure: NT (nontraffic).
- 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, and brick.
- 6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
- E. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant ES-2:
 - 1. Products:
 - a. Pecora Corporation; 898.
 - b. Tremco; Tremsil 600 White.
 - 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: G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: color anodic aluminum aluminum coated with a high-performance coating galvanized steel and ceramic tile.
- F. Single-Component Mildew-Resistant Acid-Curing Silicone Sealant ES-3:
 - 1. Products:
 - a. Dow Corning Corporation; 786 Mildew Resistant.
 - b. GE Silicones; Sanitary SCS1700.
 - 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: G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: color anodic aluminum, aluminum coated with a high-performance coating, and ceramic tile.
- G. Multicomponent Nonsag Urethane Sealant ES-4:
 - 1. Products:
 - a. Pecora Corporation; Dynatrol II.
 - b. Tremco; Dymeric 240/240FC.
 - c. Tremco; Vulkem 921.
 - 2. Type and Grade: M (multicomponent) and NS (nonsag).
 - 3. Class: 50.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, brick, ceramic tile, and wood.
- H. Multicomponent Nonsag Urethane Sealant ES-5:
 - 1. Products:

- a. Sonneborn, Division of ChemRex Inc.; NP 2.
- b. Approved equal by other named manufacturer.
- 2. Type and Grade: M (multicomponent) and NS (nonsag).
- 3. Class: 25.
- 4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
- 5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.
- 6. Use O Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, and brick.

2.4 PREFORMED JOINT SEALERS

- A. Type PS-1 Exterior Expansion Joint Sealer: Precompressed foam sealer; factory-applied and cured silicone facing.
 - 1. Face color: Coordinated with veneer; to be selected by Architect.
 - 2. Size as required to provide weathertight seal when installed.
 - 3. Provide product recommended by manufacturer for traffic-bearing use.
 - 4. Product: Colorseal manufactured by EMSEAL.
 - 5. Applications: Use for:
 - a. Exterior wall expansion joints.

2.5 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
- D. Secondary Joint Backing: Precompressed foam sealer; urethane with water-repellent.
 - 1. Size as required to provide weathertight seal when installed.
 - 2. Product: Backerseal manufactured by EMSEAL.
- E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.3 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.

- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
- E. Install bond breaker where joint backing is not used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints concave.

3.4 CLEANING

A. Clean adjacent soiled surfaces.

3.5 PROTECTION

A. Protect sealants until cured.

3.6 SCHEDULE

- A. Joint-Sealant Application JS-1: Exterior vertical and horizontal nontraffic construction joints in cast-in-place concrete.
 - 1. Joint Sealant: ES-1 or ES-4.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- B. Joint-Sealant Application JS-2: Exterior horizontal traffic isolation and contraction joints in cast-in-place concrete slabs.
 - 1. Joint Sealant: ES-5.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- C. Joint-Sealant Application JS-3: Exterior vertical control and expansion joints in unit masonry.
 - 1. Joint Sealant: ES-1 or ES-4.
 - 2. Joint-Sealant Color: Maximum of four custom colors.
- D. Joint-Sealant Application JS-5: Exterior vertical joints between different materials listed above.
 - 1. Joint Sealant: ES-1 or ES-4.
 - 2. Joint-Sealant Color: Maximum of four custom colors.
- E. Joint-Sealant Application JS-6: Exterior perimeter joints between masonry and frames of doors, windows, and louvers.
 - 1. Joint Sealant: ES-1 or ES-4.
 - 2. Joint-Sealant Color: Maximum of four custom colors.
- F. Joint-Sealant Application JS-7: Vertical control and expansion joints on exposed interior surfaces of exterior walls.
 - 1. Joint Sealant: ES-4.
 - 2. Joint-Sealant Color: To be field painted.
- G. Joint-Sealant Application JS-8: Interior perimeter joints of exterior openings.
 - 1. Joint Sealant: ES-2 or ES-3.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- H. Joint-Sealant Application JS-9: Interior ceramic tile expansion, control, contraction, and isolation joints in horizontal traffic surfaces.
 - 1. Joint Sealant: ES-2 or ES-3.

- 2. Joint-Sealant Color: Maximum of two custom colors.
- I. Joint-Sealant Application JS-10: Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
 - 1. Joint Sealant: ES-2 or ES-3.
 - 2. Joint-Sealant Color: White.
- J. Joint-Sealant Application JS-11: Vertical joints on exposed surfaces of interior unit masonry and concrete walls.
 - 1. Joint Sealant: ES-4.
 - 2. Joint-Sealant Color: To be field painted.
- K. Joint-Sealant Application JS-12: Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
 - 1. Joint Sealant: LS-1.
 - 2. Joint-Sealant Color: To be field painted.
- L. Joint-Sealant Application JS-13: Preformed exterior expansion joints without cover.
 - 1. Location: Where designated on drawings.
 - 2. Joint Sealant: PS-1, where indicated to produce a finished color.

SECTION 07 95 13 - EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Expansion joint assemblies for floor, wall, ceiling surfaces.
- 1.2 RELATED REQUIREMENTS
 - A. Section 03 10 00 Concrete Forming and Accessories: Placement of joint assembly frames in formwork.

1.3 REFERENCE STANDARDS

- A. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- B. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices, available colors and finish .
- C. LEED Report: Accurately document the use of recycled materials, as required by Section 01 81
 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
- D. Shop Drawings: Indicate joint and splice locations, miters, layout of the work, affected adjacent construction, anchorage locations .
- E. Samples: Submit two samples minimum 12 inch long, illustrating profile, dimension, color, and finish selected.
- F. Manufacturer's Installation Instructions: Indicate rough-in sizes; provide templates for cast-in or placed frames or anchors; required tolerances for item placement.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Architectural Art Mfg. Company.
 - 1. Floor-to-Floor Joint Systems: A Series, serrated type.
 - 2. Floor-to-Wall Joint Systems: A Series, serrated type.
 - 3. Wall-to-Wall Joint Systems: G Series, snap on type.
 - 4. Wall-to-Ceiling Joint Systems: C Series.
 - 5. Ceiling-to-Ceiling Joint Systems: C Series.
- B. Balco, Inc.
 - 1. Floor-to-Floor Joint Systems: 6000 Series, serrated type.
 - 2. Floor-to-Wall Joint Systems: 6000 Series, serrated type.
 - 3. Wall-to-Wall Joint Systems: WD/WDC Series.
 - 4. Wall-to-Ceiling Joint Systems: 7500 Series.
 - 5. Ceiling-to-Ceiling Joint Systems: 7500 Series.
- C. Construction Specialties, Inc: www.c-sgroup.com.
 - 1. Floor-to-Floor Joint Systems: ALS Series.

- 2. Floor-to-Wall Joint Systems: ALSW Series.
- 3. Wall-to-Wall Joint Systems: ASM Series.
- 4. Wall-to-Ceiling Joint Systems: Thinline Series; Type FCF.
- 5. Ceiling-to-Ceiling Joint Systems: Thinline Series; Type FCF.
- D. MM Systems Corp.:
 - 1. Floor-to-Floor Joint Systems: Classic Cover Systems; type HFX.
 - 2. Floor-to-Wall Joint Systems: Classic Cover Systems; type HFXE.
 - 3. Wall-to-Wall Joint Systems: Model EX-K for flat and Model EX-L for corner.
 - 4. Wall-to-Ceiling Joint Systems: Flexible Wall and Ceiling Series VSWL and VSGL.
 - 5. Ceiling-to-Ceiling Joint Systems: Flexible Wall and Ceiling Series VSG.

2.2 EXPANSION JOINT COVER ASSEMBLIES

- A. Expansion Joint Cover Assemblies General: Factory-fabricated and assembled; designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
 - 1. Joint Dimensions and Configurations: As indicated on drawings.
 - 2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
 - 3. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
 - 4. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.
 - 5. At floor-to-floor and floor-to-wall expansion joint locations with a fire rated floor system which are not exposed to view, provide and install joint fill material within joint to maintain fire rating. Joint cover is not required at these concealed locations.
- 2.3 MATERIALS
 - A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper; or ASTM B308/B308M, 6061 allow, T6 temper.
 - 1. Exposed Finish Outdoors: Natural anodized.
 - 2. Exposed Finish at Floors: Mill finish or natural anodized.
 - 3. Exposed Finish at Walls and Ceilings: Natural anodized.
 - B. Resilient Seals:
 - 1. For Ceilings: Any resilient material, flush, pleated, or hollow gasket.
 - 2. Color: To be selected from manufacturers full line.
 - C. Anchors and Fasteners: As recommended by cover manufacturer.
 - D. Ferrous Metal Anchors: Galvanized where embedded in concrete or in contact with cementitious materials.
 - E. Resilient Filler: Neoprene, exhibiting Shore A hardness of 40 to 50 Durometer.
 - F. Backing Paint for Aluminum Components in Contact with Cementitious Materials: Asphaltic type.

2.4 FABRICATION

- A. Joint Covers: Aluminum cover plate, aluminum frame construction, retainers with resilient elastomeric filler strip, designed to permit plus or minus 50 percent joint movement with full recovery, flush mounted.
- B. Back paint components in contact with cementitious materials.
- C. Shop assemble components and package with anchors and fittings.

D. Provide joint components in single length wherever practical. Minimize site splicing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.
- 3.2 PREPARATION
 - A. Provide anchoring devices for installation and embedding under Section 03 10 00.
 1. Provide templates and rough-in measurements.

3.3 INSTALLATION

- A. Install components and accessories in accordance with manufacturer's instructions.
- B. Align work plumb and level.
- C. Rigidly anchor to substrate to prevent misalignment.

3.4 PROTECTION

A. Do not permit traffic over unprotected floor joint surfaces.

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-fire-rated steel doors and frames.
- B. Steel frames for wood doors.
- C. Fire-rated steel doors and frames.
- D. Thermally insulated steel doors.
- E. Steel glazing frames.

1.2 RELATED REQUIREMENTS

- A. Section 08 71 00 Door Hardware.
- B. Section 08 80 00 Glazing: Glass for doors and borrowed lites.

1.3 REFERENCE STANDARDS

- A. ANSI A250.8 SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
- B. ANSI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2004).
- C. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- D. BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames; 2006.
- E. NAAMM HMMA 840 Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.
- F. NFPA 80 Standard for Fire Doors and Other Opening Protectives; 2010.
- G. UL (BMD) Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- H. UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
- D. LEED Report: Accurately document the use of recycled materials, as required by Section 01354, Section 01355, Section 01356 and appropriate forms, and Section 01600.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Maintain at the project site a copy of all reference standards dealing with installation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with NAAMM HMMA 840.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Assa Abloy Ceco, Curries, or Fleming: www.assaabloydss.com.
- B. Steelcraft: www.steelcraft.com.
- C. Pioneer Industries .
- D. Security Metal Partitions Corporation.

2.2 DOORS AND FRAMES

- A. Requirements for All Doors and Frames:
 - 1. Door Top Closures: Flush with top of faces and edges.
 - 2. Door Edge Profile: Beveled on both edges.
 - 3. Door Texture: Smooth faces.
 - 4. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
 - 5. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
 - 6. Galvanizing for Exterior Units and Units in Wet Areas: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
 - 7. Finish: Factory primed, for field finishing.
 - 8. Recycled Content: Provide steel with minimum 30 percent total recycled content including at least 25 percent post-consumer recycled content.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 STEEL DOORS

- A. Exterior Doors :
 - 1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
 - 2. Core: Polystyrene foam.
 - 3. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
 - 4. Weatherstripping: Separate, see Section 08 71 00.
 - 5. Close to and bottom edges with galvanized, inverted steel channels; seal joints in top edges of doors against water penetration.
- B. Interior Doors, Non-Fire-Rated:
 - 1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
- C. Interior Doors, Fire-Rated:
 - 1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.

- 2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C ("positive pressure").
 - a. Rate of Temperature Rise Across Door Thickness for Stair Enclosure Doors: 450 F degrees.
 - b. Provide units listed and labeled by UL.
 - c. Attach fire rating label to each fire rated unit.

2.4 STEEL FRAMES

- A. General:
 - 1. Comply with the requirements of grade specified for corresponding door, except:
 - a. ANSI A250.8 Level 3 Doors: 14 gage frames.
 - b. Frames for Wood Doors: Comply with frame requirements specified in 14 gage frames.
 - c. Frames for Sound-Rated Wood Doors: Comply with frame requirements specified in 14 gage frames.
 - 2. Finish: Same as for door.
 - 3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
 - 4. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
- B. Exterior Door Frames: Full profile welded, seamless.
 - 1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
 - 2. Weatherstripping: Separate, see Section 08 71 00.
- C. Interior Door Frames, Non-Fire-Rated: Full profile welded type.
- D. Interior Door Frames, Fire-Rated: Full profile welded type.
 - 1. Fire Rating: Same as door, labeled.
- E. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.
- F. Mullions and Transom Bars: Join to adjacent members by welding.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, 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, welded to back of frames; not less than 0.042 inch thick.
- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.6 ACCESSORY MATERIALS

A. Glazing: As specified in Section 08 80 00.

- B. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.
- C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- D. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.
- E. Ceiling Struts: Minimum 1/4 inch thick by 1 inch wide steel.
- 2.7 FINISH MATERIALS
 - A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
 - B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.1 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.2 INSTALLATION

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. In addition, install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Install door silencers in frames before grouting.
- E. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- F. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
- G. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
- H. Coordinate installation of hardware.
- I. Coordinate installation of glazing; install frames with removable glazing stops located on secure side of opening.
- J. Coordinate installation of electrical connections to electrical hardware items.
- K. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
- L. Touch up damaged factory finishes.
- M. 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.
- 3. Smoke-Control Doors: Install doors according to NFPA 105.

3.3 TOLERANCES

- A. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
- B. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
- C. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
- D. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

3.4 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- C. Remove grout and other bonding material from hollow metal work immediately after installation.
- D. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- E. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flush wood doors; flush configuration; fire rated, non-rated, and acoustical.
- 1.2 RELATED REQUIREMENTS
 - A. Section 08 80 00 Glazing.

1.3 REFERENCE STANDARDS

- A. ASTM E413 Classification for Rating Sound Insulation; 2010.
- B. ASTM E1408 Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).
- C. AWI/AWMAC (QSI) Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.
- D. ITS (DIR) Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- E. NFPA 80 Standard for Fire Doors and Other Opening Protectives; 2010.
- F. UL (BMD) Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- G. UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Specimen warranty.
- D. Test Reports: Show compliance with specified requirements for the following:
 - 1. Sound-retardant doors and frames; sealed panel tests are not acceptable.
- E. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing and louvers.
- F. Samples: Submit two samples of door veneer, 12 x 12 inch in size illustrating wood grain, stain color, and sheen.
- G. LEED Submittals:
 - 1. Certificates for Credit MR 7: Chain-of-custody certificates certifying that flush wood doors comply with forest certification requirements. Include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
 - 2. Include statement indicating costs for each certified wood product.
 - 3. Product Data for Credit EQ 4.4: For adhesives and composite wood products, documentation indicating that product contains no added urea formaldehyde.
 - 4. Product data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of pre-consumer and post-consumer recycled content. Include statement indicating cost of each product with recycled content.
- H. Warranty, executed in Owner's name.

1.5 QUALITY ASSURANCE

A. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.7 PROJECT CONDITIONS

A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.8 WARRANTY

- A. See Section 01 78 00 Closeout Submittals for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Wood Veneer Faced Doors:
- B. Eggers Industries: www.eggersindustries.com.
- C. Marshfield DoorSystems, Inc: www.marshfielddoors.com.
- D. Algoma Hardwoods, Inc. .
- E. Oshkosh Architectural Door Company.
- F. VT Industries, Inc.

2.2 DOORS

- A. All Doors: See drawings for locations and additional requirements.
 - Quality Level: Custom Grade, in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1300.
 a. Grade A faces.
 - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
 - 3. Faces are bonded to core using a hot press.
 - 4. Provide wood doors made from wood harvested from forests certified by an FSC-accredited certification body.
 - 5. Provide doors assembled with glues containing no added urea-formaldehyde.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at all locations .
 - 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C or UBC Standard 7-2-97 ("positive pressure"); UL or WH (ITS) labeled without any visible seals when door is open.

- 3. Sound Retardant Doors: Minimum STC of 42 or better, calculated in accordance with ASTM E413, tested in accordance with ASTM E1408.
 - a. Provide doors specifically designed for sound transmission control with a high density core and damping.
 - b. Refer to hardware specification for required hardware items.
- 4. Wood veneer facing with factory transparent finish .

2.3 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated above.
 - 1. Particleboard: Minimum 80 percent recycled content.
- B. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
- C. Sound Retardant Doors: Equivalent to Type PC construction with core as required to achieve rating specified; plies and faces as indicated above.

2.4 DOOR FACINGS

- A. Wood Veneer Facing for Transparent Finish: White Maple, veneer grade as specified by quality standard, plain sliced, book veneer match, running assembly match; unless otherwise indicated.
 - 1. Vertical Edges: Any option allowed by quality standard for grade.
 - 2. Pairs: Pair match each pair; set match pairs within 10 feet of each other when doors are closed.
 - 3. Room Match: Match door faces within each separate room or area of building. Corridor door faces do not need to match where they are separated by 20 feet or more.

2.5 ACCESSORIES

A. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

2.6 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with Bonded Stiles and Rails:
 - 1. Provide solid blocks at lock edge for hardware reinforcement.
 - 2. Provide solid blocking for other throughbolted hardware.
- C. Fit door edge trim to edge of stiles after applying veneer facing.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

2.7 FACTORY FINISHING - WOOD VENEER DOORS

- A. Factory finish doors in accordance with specified quality standard:
 - 1. Transparent Finish: Transparent catalyzed polyurethane, Premium quality, TR-6, satin sheen.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 1. Install fire-rated doors in accordance with NFPA 80 requirements.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.
- E. Coordinate installation of glazing.

3.2 TOLERANCES

- A. Conform to specified quality standard for fit and clearance tolerances.
- B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.3 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

SECTION 08 17 13 - INTEGRATED METAL DOOR OPENING ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes cross-corridor door pair assemblies and integrated door assemblies, including frames, doors, operating hardware and installation accessories for a complete labeled assembly.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 8 Section "Door Hardware" for door hardware requirements.
 - 2. Division 8 Section "Glazing" for glass in packaged door assembly units.
 - 3. Division 26 Sections for electrical rough-in, wiring and connections for electromagnetic door closers and smoke detectors.

1.2 PERFORMANCE REQUIREMENTS

- A. Provide packaged door assemblies exceeding these minimum performance standards.
- B. Performance Standards:
 - 1. Steel Doors: In accordance with ANSI/SDI A250.8, Grade 1, but not less than 5,000,000 cycles.
 - 2. Exit Devices: In accordance with ANSI/BHMA A156.3, Grade 1, but not less than 5,000,000 cycles.
 - 3. Closers: In accordance with ANSI/BHMA A156.4, Grade 1.
 - 4. Mortise Locks/Latches: In accordance with ANSI/ BHMA A156.13, Grade 1, but not less than 5,000,000 cycles.
 - 5. Full-height Hinges: In accordance with ANSI/ BHMA A156.26, Grade 1, but not less than 5,000,000 cycles.

1.3 SUBMITTALS

- A. Product Data: For each type of door assembly specified, including details of construction, materials, dimensions, hardware, core, label compliance, profiles, and finishes.
- B. Shop Drawings: Show fabrications and installation of door assemblies. Include details of frame types, conditions at openings, details of construction, location and installation requirements of hardware and reinforcements, electrical rough-in requirements, and details of joints and connections. Show anchorage and accessory items.
- C. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on the Contract Drawings. Indicate coordination of glazing frames and stops with glass and glazing requirements.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the packaged door assembly manufacturer for both installation and maintenance of door units.
- B. Fire-Rated Door Assemblies: Provide assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for required fire ratings, based on testing according to NFPA 252.

1.5 QUALITY CONTROL

A. Field Measurement, all bidders must arrange to custom measure each opening at the job site to insure the door assemblies are custom sized to fit the existing job site conditions.

1.6 DELIVERY AND STORAGE

- A. Protect door assemblies during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with manufacturer's written instructions.
- B. Mark each door assembly with individual opening numbers used on Shop Drawings. Use removable tags or concealed markings.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed.

1.8 WARRANTY

- A. General Warranty: Door assembly manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Manufacturer's Warranty: Submit written agreement on door assembly manufacturer's standard form, signed by manufacturer, Installer, and Contractor, agreeing to repair or replace door assemblies with defects in materials and workmanship within the specified warranty period. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective door components.
 - 1. Warranty Period for Defects in Materials and Workmanship: 2 years from date of Substantial Completion.
 - 2. Warranty Period for Full Width Exit Devices: Lifetime.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. TOTAL-DOOR Assembly, by Openings, Inc.
 - 2. INPACT Door System; Ingersoll-Rand Company.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366, commercial quality.
- B. Supports and Anchors: Fabricated from not less than 0.0478-inch thick steel sheet.
- C. Inserts, Bolts, and Fasteners: Manufacturer's standard units.
- 2.3 FRAMES
 - A. 16 gage; complying with SDI 100 and 111A; factory baked enamel finish.
- 2.4 DOORS
 - A. 1-3/4-inch thick; 20 gage bonderized steel sheets; solid polystyrene insulation bonded to both door faces; wood veneer on metal finish.

2.5 HARDWARE

- A. Refer to the Hardware Sets in specification Section 08 71 00 for specific requirements.
- B. All hardware shall be provided by the packaged door assembly manufacturer.
 - 1. Exception: Cylinders, kick plates, stops and magnetic holders are furnished and installed under Section 08 71 00. Lever handles and closers may be field installed.

C. Hinges:

- 1. Provide semi-concealed continuous type with no projecting knuckles.
- 2. 14-gage electro-galvanized steel with a catalyzed two part polyurethane finish.
- 3. Hinges shall not be surface mounted on doors.
- D. Provide rough-in for electric hold-opens on door as required.
- E. Closers: Provide LCN XP4040-EDA closers with parallel arm at all locations.
 - 1. Include manufacturer's mechanical hold-open feature at doors indicated.
 - 2. Include manufacturer's integral dead-stop feature at doors indicated.
- F. Panic Exit Devices (INPACT Door System): Ingersoll-Rand Co. Von Duprin INPACT 94 Series recessed exit device, with concealed top vertical rod only - less bottom rod (LBR); standard doors Model 9447-LBR; fire-rated doors Model 9447-F-LBR.
 - 1. Undogged devices shall not protrude more than 1-5/8 inch beyond door surface; depressed projection shall not exceed 1-1/4 inch.
 - 2. Lever Trim: Von Duprin 940L with 06 levers.

2.6 FABRICATION

- A. Fabricate door assemblies according to manufacturer's published specifications and applicable code requirements.
- B. Coordinate door assembly details with details of adjacent work to assure proper attachments, and clean junctions.
- C. Provide complete door assemblies with door, hinge and suspension system, locking channel mechanism, smoke seals at head and meeting stile, 0.0516-inch (18 gage) roller leveled, electro-galvanized, and bonderized steel faces.
 - 1. Vertical Galvanized Reinforcement Stiles: 0.0635-inch (16 gage) minimum.
- D. Fabricate door units to be rigid, neat in appearance, and free from defects, warp, or buckle. Comply with SDI 100 requirements.
- E. Equip doors with factory installed panic hardware. No surface mounted or concealed vertical rods will be accepted.
- F. Pairs of doors shall have no mullion or other type of obstruction when doors are fully opened.
- G. Furnish frames with removable spreader bar at sill.

2.7 FINISHES

- A. Frames: Factory-applied gray primed. Finish coat by others.
- B. Hinge Lock Channel and Lite Kit Frame: Manufacturer's standard two-part polyurethane infrared baked finish. Custom color as selected by Architect.
- C. Exposed Metal Surfaces on Doors: Wood veneer over steel faces.
 - 1. Species: White Maple.
 - 2. Cut, Match and Finish: Match wood doors; prefinished.

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 packaged wood door assemblies. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install wood door assemblies according to Shop Drawings, manufacturer's instructions, and as specified.
- B. Placing Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
- C. Door Installation: Fit doors accurately in frames, within clearances specified in SDI 100. Install fire rated doors with clearances specified in NFPA 80. Adjust doors to swing freely without binding, sticking, or sagging. Maintain manufacturer's installation tolerances.
- D. Adjust operating hardware for proper operation and function.

SECTION 08 31 00 - ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Access door and frame units, fire-rated, in wall locations.
- 1.2 REFERENCE STANDARDS
 - A. ITS (DIR) Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
 - B. UL (FRD) Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of all access door units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Babcock-Davis.
 - 1. Non-Rated: Cierra B-NT Series.
 - 2. Rated: Cierra B-IT Series.
- B. Karp Associates, Inc: www.karpinc.com.
- C. Milcor by Commercial Products Group of Hart & Cooley, Inc: www.milcorinc.com.
- D. J. L. Industries, Inc. .
- E. Larsen's Manufacturing Company.
- F. Nystrom, Inc.
- G. Williams Bros. Corporation of America (The).
- 2.2 ACCESS DOORS AND PANELS
 - A. All Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.
 - B. Units in Fire Rated Assemblies: Fire rating equivalent to the fire rated assembly in which they are to be installed.
 - 1. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.

2.3 ACCESS DOOR UNITS - WALLS AND CEILINGS

- A. Door and Frame Units: Formed steel.
 - 1. Door: Minimum 16 gage thick sheet metal, set flush with exposed face flange of frame.
 - 2. Frame: Minimum 16 gage thick sheet metal with 1 inch wide, surface-mounted trim.
 - 3. Hinges: Concealed pivot rod.
 - 4. Lock: Provide door panel with cylinder keyed to building masterkey program.
- B. Fire-Rated, Insulated, Flush Access Doors and Frames with Exposed Trim: Formed steel.
 - 1. Fire-Resistance Rating: Not less than that of adjacent construction.

- 2. Temperature Rise Rating: 250 deg F at the end of 30 minutes.
- 3. Door: Flush panel with a core of mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 20 gage.
- 4. Frame: Minimum 16 gage thick sheet metal with 1-inch wide, surface-mounted trim.
- 5. Hinges: Concealed-pin type.
- 6. Automatic Closer: Spring type.
- 7. Lock: Self-latching device with cylinder lock.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings. Secure rigidly in place.
- C. Position units to provide convenient access to the concealed work requiring access.

SECTION 08 41 23 - FIRE RATED ALUMINUM FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Fire rated glazing and framing for installation as glazed systems in interior openings
- B. Related Sections:
 - 1. Section 05 12 00 "Structural Steel Framing:" Steel attachment members
 - 2. Section 05 50 00 "Metal Fabrications:" Steel attachment members inserts and anchors
 - 3. Section 07 84 00 "Firestopping:" Firestops between work of this section and other fire resistive assemblies.
 - 4. Section 08 11 00 "Metal Doors and Frames" for fire-rated doors.
 - 5. Section 08 11 13 "Hollow Metal Doors and Frames." Hollow Metal doors prepped for the work of this section.
 - 6. Section 08 41 23 "Fire Rated Steel Framed Entrances Fireframes Heat Barrier Series" for fire-rated doors.
 - 7. Section 08 41 23 "Fire Rated Glass And Framing Systems Fireframes Designer Series" for fire-rated doors.
 - 8. Section 08 71 00 "Door Hardware:" Door hardware other than that provided by the work of this section

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA)
 - 1. AAMA 2603-2002 Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - 2. AAMA 2604 -2005 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 3. AAMA 2605 -2005 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. American Society for Testing and Materials (ASTM):
 - 1. Fire safety related:
 - a. ASTM E119: Methods for Fire Tests of Building Construction and Materials.
 - 2. Material related
 - a. ASTM A 1008/A 1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2007.
 - b. ASTM A 1011/A 1011M Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2006b.
- C. American Welding Society (AWS)
 - 1. AWS D1.3 Structural Welding Code Sheet Steel; 2007
- D. Builders Hardware Manufacturers Association, Inc.
 - 1. BHMA A156 American National Standards for door hardware; 2006 (ANSI/BHMA A156).
- E. Canadian Standards
 - 1. CAN-S101 Fire Endurance Tests of Building Construction and Materials

- 2. CAN4-S104-M, "Fire Tests of Door Assemblies"
- 3. CAN4-S106-M, "Standard Method for Fire Tests of Window and Glass Block Assemblies"
- F. National Fire Protection Association (NFPA):
 - 1. NFPA 80: Fire Doors and Windows.
 - 2. NFPA 251: Fire Tests of Building Construction & Materials
 - 3. NFPA 252: Fire Tests of Door Assemblies
 - 4. NFPA 257: Fire Test of Window Assemblies
- G. Underwriters Laboratories, Inc. (UL):
 - 1. UL 9: Fire Tests of Window Assemblies.
 - 2. UL 10 B: Fire Tests of Door Assemblies
 - 3. UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies
 - 4. UL 263: Fire tests of Building Construction and Materials
 - 5. UL-752 Ratings of Bullet-Resistant Materials
- H. American National Standards Institute (ANSI):
 - 1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings
- I. Consumer Product Safety Commission (CPSC):
 - 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials
- J. American Society of Civil Engineers (ASCE)
 - 1. ASCE 7 Minimum Design Loads for Buildings and Other Structures; 2010

1.3 **DEFINITIONS**

- A. Manufacturer: A firm that produces primary glass, fabricated glass or framing as defined in referenced glazing publications.
- 1.4 SUBMITTALS
 - A. Submit in accordance with Section Section 01 30 00 Administrative Requirements.
 - B. Product Data:
 - 1. Technical Information: Submit latest edition of manufacturer's product data providing product descriptions, technical data, Underwriters Laboratories, Inc. listings and installation instructions.
 - C. LEED Report: Accurately document the use of recycled materials, as required by Section 01 81
 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
 - D. LEED Submittal: For sealants applied within the building waterproofing envelope, documentation including printed statement of VOC content in g/L.
 - E. Shop Drawings:
 - 1. Include plans, elevations and details of product showing component dimensions; framing opening requirements, dimensions, tolerances, and attachment to structure
 - 2. Provide templates for the location of embeds and anchor locations required for any adjoining work.
 - F. Structural Calculations:
 - 1. Provide structural calculations sealed by a licensed professional engineer in the State in which the project is located; prepared in compliance with referenced documents and these specifications.
 - G. Samples for following products:

- 1. Glass sample-as provided by manufacturer
- 2. Sample of frame
- 3. Verification of sample of selected finish
- H. Glazing Schedule: Use same designations indicated on drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- I. Warranties: Submit manufacturer's warranty.
- J. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements.
 - 1. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualifications according to
 - 1. International Accreditation Service for a Type A Third-Party Inspection Body (Field Services ICC-ES Third-Party Inspections Standard Operating Procedures, 00-BL-S0400 and S0401)
 - 2. International Accreditation Service for Testing Body-Building Materials and Systems
 - a. Fire Testing
 - 1) ASTM Standards E 119
 - 2) CPSC Standards 16 CFR 1201
 - 3) NFPA Standards 251, 252, 257
 - 4) UL Standards 9, 10B, 10C, 1784, UL Subject 63
 - 5) BS 476; Part 22: 1987
 - 6) EN 1634-1
 - 7) CAN Standards S 101, S 104, S 106
- B. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are classified and labeled by UL, for fire ratings indicated, based on testing according to NFPA 257 and UL 9.
- C. Fire-Rated Wall Assemblies: Assemblies complying with ASTM E119 that are classified and labeled by UL, for fire ratings indicated, based on testing in accordance with UL 263, ASTM E119.
- D. Listings and Labels Fire Rated Assemblies: Under current follow-up service by Underwriters Laboratories® maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle under provisions specified by manufacturer.

1.7 PROJECT CONDITIONS

- A. Obtain field measurements prior to fabrication of frame units. If field measurements will not be available in a timely manner coordinate planned measurements with the work of other sections.
 - 1. Note whether field or planned dimensions were used in the creation of the shop drawings.
- B. Coordinate the work of this section with others effected including but not limited to: other interior components and door hardware beyond that provided by this section

1.8 WARRANTY

A. Provide the Pilkington Pyrostop® and Fireframes® standard five-year manufacturer warranty.

PART 2 – PRODUCTS

- 2.1 MANUFACTURERS
 - A. Basis-of-Design:
 - Manufacturer Glazing Material: "Pilkington Pyrostop®" fire-rated glazing as manufactured by the Pilkington Group and distributed by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065 (800-426-0279) fax (800-451-9857) e-mail sales@fireglass.com, web site http://www.fireglass.com
 - Frame System: "Fireframes® Aluminum Series" fire-rated frame system as manufactured and supplied by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065 (800-426-0279) fax (800-451-9857) e-mail sales@fireglass.com web site http://www.fireglass.com
 - B. Other Acceptable Manufacturers:
 - 1. Aluflame North America.
 - 2. SaftiFirst, GPX Architectural Series.

2.2 PERFORMANCE REQUIREMENTS

- A. System Description:
 - 1. Steel fire-rated glazed wall and/or window system, dual aluminum cover cap format
 - a. Face widths available:
 - 1) 2"
 - b. Duration Windows Capable of providing a fire rating for 120 minutes.
 - c. Duration Walls: Capable of providing a fire rating for 120 minutes.
- B. Delegated design: For the performance requirements listed below requiring structural design provide data, calculations and drawings signed and sealed by an engineer licensed in the state where the project is located.
- C. Design Requirements
 - 1. Design and size the system to withstand structural forces placed upon it without damage or permanent set when tested in accordance with ASTM E330 using load 1.5 times the design wind loads and of 10 seconds in duration at +/- 10 PSF.

2.3 MATERIALS - GLASS

- A. Fire Rated Glazing: Composed of multiple sheets of Pilkington Optiwhite[™] high visible light transmission glass laminated with an intumescent interlayer.
- B. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201(Cat. I and II).
- C. Properties Interior Glazing
 - 1. Fire Rating: 120 minute
 - 2. Manufacturer's designation: 120-106
 - 3. Glazing type: IGU
 - 4. Nominal Thickness: 2-1/4" (57mm)
 - 5. Weight in lbs/sf: 22.9
 - 6. Daylight Transmission: 75%
 - 7. Sound Transmission Coefficient: 46dB

- D. Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacture, testing laboratory (UL), fire rating period, safety glazing standards, and date of manufacture.
- E. Glazing Accessories: Manufacturer's standard compression gaskets, standoff, spacers, setting blocks and other accessories necessary for a complete installation.

2.4 MATERIALS – ALUMINUM FRAMES

- A. Aluminum Framing System 120 min.
 - 1. Steel Frame The steel framing members are made of two halves, nom. 1.9 in. wide (48.3 mm) with a nom. minimum depth of 1.38 in. (35 mm) with lengths cut according to glazing size.
 - 2. Aluminum Trim Supplied with the steel framing members. Nom. 2 in. (50.8 mm) wide with a nom. depth of 1.54 in. (39 mm) with lengths cut according to glazing size.
 - 3. Stainless Steel Standoffs Supplied with the steel framing members. Nom 5/16 in. (8 mm) diameter with a nom. minimum depth of 1 1/8 in. (28 mm) with depth adjusted to match Pilkington Pyrostop® Panel thickness.
 - 4. Stainless Steel Moment and Connecting Braces: Supplied with the steel framing members. Nom 3/8 in. (10 mm) thick with a nom. minimum depth of 1 1/8 in. (28 mm) with depth adjusted to match Pilkington Pyrostop® Panel thickness.
 - 5. Framing Member Fasteners Supplied with the steel framing members. Screws are M6 x16mm Button Head Socket Cap Screws for frame assembly and #6 x 1" Pan Head Sheet Metal Screws for door installation.
 - 6. Glazing Gasket Supplied with the steel framing members. Nom. 3/4 in. (19 mm) by 3/16 in. (4.5 mm) black applied to the steel framing members to cushion and seal the glazing material when installed.

2.5 FABRICATION

- A. Obtain reviewed shop drawings prior to fabrication.
- B. Fabrication Dimensions: Fabricate fire-rated assembly to field dimensions.
- C. Factory prepared, fire-rated steel door assemblies by TGP to be prehung, prefinished with hardware preinstalled for field mounting.
- D. Field glaze door and frame assemblies.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish frames after assembly.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.7 FINISHES

A. High-Performance Organic Finish (3-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride

resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.

- B. Color and Gloss: Custom color as selected by Architect.
- 2.8 ACCESSORY MATERIALS
 - A. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil thickness per coat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions: Examine substrates and members to which the work of this section attaches or adjoins prior to frame installation are acceptable for product installation in accordance with manufacturer's instructions. Provide openings plumb, square and within allowable tolerances. The manufacturer recommends 3/8 inch shim space at all walls
- B. Notify Architect of any conditions which jeopardize the integrity of the proposed fire wall / door system.
- C. Do not proceed until such conditions are corrected.

3.2 INSTALLATION

- A. Install per manufacturers instructions.
- 3.3 PROTECTION AND CLEANING
 - A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface`. Remove nonpermanent labels, and clean surfaces.
 - 1. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
 - 2. Do not use any of the following:
 - a. Steam jets
 - b. Abrasives
 - c. Strong acidic or alkaline detergents, or surface-reactive agents
 - d. Detergents not recommended in writing by the manufacturer
 - e. Do not use any detergent above 77 degrees F
 - f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
 - g. Metal or hard parts of cleaning equipment must not touch the glass surface
 - B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
 - C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

SECTION 08 43 13 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Weatherstripping.
- D. Perimeter sealant.

1.2 RELATED REQUIREMENTS

- A. Section 07 90 05 Joint Sealers: Perimeter sealant and back-up materials.
- B. Section 08 80 00 Glazing: Glass and glazing accessories.

1.3 REFERENCE STANDARDS

- A. AAMA CW-10 Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.
- B. AAMA 501.2 Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2009 (part of AAMA 501).
- C. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- D. AAMA 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 2009.
- E. ASCE 7 Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.
- F. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2008.
- G. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- H. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- I. ASTM B209M Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
- J. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2012.
- K. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2012.
- L. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- M. SSPC-Paint 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.4 PERFORMANCE REQUIREMENTS

- A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - 1. Design Wind Loads: Comply with requirements of the (IBC) International Building code.
 - 2. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
- B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
- C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E 283.
- D. Condensation Resistance Factor: CRF of not less than 57 (exterior frames) when measured in accordance with AAMA 1503.1.
- E. Thermal Resistance of Exterior Framing: Thermal transmittance U value not more than 0.38 BTU/HR/FT²/°F when measured in accordance with AAMA 1503.1.
- F. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 12 lbf/sq ft.
- G. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
- H. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

1.5 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details .
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
 - 1. Shop drawings must be prepared by the manufacturer under the supervision of a Professional Structural Engineer registered in the State of Maryland.
 - 2. Shop drawings must be signed and sealed by the supervising Professional Structural Engineer registered in the State of Maryland.
- D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, dimensional limitations.
 - 1. ust be signed and sealed by the supervising Professional Structural Engineer.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. LEED Report: Accurately document the use of recycled materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.

- G. LEED Submittals: Provide VOC content documentation for field-applied sealants and primers; comply with VOC content limits of Section 01 61 16.
- H. Report of field testing for water leakage.
- I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Maryland.
- B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum five years of documented experience.
- 1.7 PRE-INSTALLATION MEETING
 - A. Convene one week before starting work of this section.
- 1.8 DELIVERY, STORAGE, AND HANDLING
 - A. Handle products of this section in accordance with AAMA CW-10.
 - B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.9 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a ten year period after Date of Substantial Completion.
- C. Provide ten year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. EFCO, a Pella Company (Basis-of-Design); Product System 403X Wall (exterior) and Product System 402 (interior): www.efcocorp.com.
- B. Kawneer North America; Product TriFab VG 45UT (exterior) and TriFab VG 451 (interior): www.kawneer.com.
- C. Oldcastle BuildingEnvelope; Product Series 3000XT (exterior) and Product FG-3000 (interior): www.oldcastlebe.com.
- D. YKK AP America; Product System YES 45 XT (exterior) and Product System YES 45 FI (interior): www.ykkap.com.

2.2 STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Glazing Position: Centered (front to back).

- 2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
- 3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
- 4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
- 5. Sill Flashing: Provide manufacturer's full height, high performance sill flashing.

2.3 COMPONENTS

- A. Recycled Content: Provide aluminum with minimum 30 percent recycled content and steel with minimum 30 percent recycled content.
- B. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 - 1. Framing members for interior applications need not be thermally broken.
 - 2. Glazing stops: Flush.
 - 3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
 - a. Install where required by required by structural design.
- C. Doors: Glazed aluminum.
 - 1. Thickness: 2 inches.
 - 2. Top Rail: 4 inches wide.
 - 3. Glazing Stops: Square.
- D. Vents: Provide project-out units.
 - 1. The windows shall be Architectural Aluminum Project Out windows in accordance with ANSI/AAMA/nwwda 101/I.S.2-97 or NAFS-1 Voluntary Specifications for Aluminum and Poly Prime Windows and Glass Doors for a Class and Grade of P-HC40 to P-HC70 for Project Out Windows.
 - a. Units submitted for laboratory testing shall be manufacturer's standard construction, glazed and assembled in accordance with manufacturer's specifications and ANSI/AAMA/nwwda 101/I.S.2-97 or NAFS-02.
 - 2. Hinge: Concealed stainless steel four- or six-bar friction hinge; two per ventilator.
 - 3. Lock: Manufacturer's cam lock and keeper.
 - 4. Finish to match framing system.
 - 5. Basis-of-Design: WV410 SSG by EFCO, a Pella Company.
 - 6. Insect Screens: Extruded aluminum frames, 6063-T5 alloy and temper, joined at corners; 18 x 16 mesh aluminum screen cloth; splines shall be extruded vinyl, removable to permit rescreening.
 - a. Frame Finish: To match aluminum window.
 - b. Screen Finish: Black anodized.

2.4 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- D. Fasteners: Stainless steel.
- E. Exposed Flashings: 0.063 inch thick aluminum sheet; finish to match framing members.
- F. Concealed Flashings: 0.018 inch thick stainless steel.
- G. Perimeter Sealant: Type ES-1 or ES-4 specified in Section 07 90 05.
- H. Glass: As specified in Section 08 80 00.
- I. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- J. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.5 FINISHES

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.

2.6 HARDWARE

- A. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- B. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

2.7 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Construct with screw spline system of assembly.
- D. Prepare components to receive anchor devices. Fabricate anchors.
- E. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
- F. Arrange fasteners and attachments to conceal from view.
- G. Reinforce components internally for door hardware .
- H. Reinforce framing members for imposed loads.
- I. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
 - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.2 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Install operating sash.
- K. Set thresholds in bed of mastic and secure.
- L. Install hardware using templates provided.
- M. Install glass and infill panels in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
- N. Install perimeter sealant in accordance with Section 07 90 05.
- O. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- 3.3 TOLERANCES
 - A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
 - B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
- 3.4 FIELD QUALITY CONTROL
 - A. Test installed storefront for water leakage in accordance with AAMA 501.2.
 - 1. Test a minimum area of 75 feet by 1 story of aluminum-framed systems designated by Architect, before installation of interior finishes; test area may not show evidence of water penetration.

3.5 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.6 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

3.7 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION

SECTION 08 44 13 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum-framed curtain wall, with vision glazing and glass infill panels.
- B. Column covers.
- C. Perimeter sealant.
- D. Firestopping between curtain wall and edge of floor slab.

1.2 PROJECT REQUIREMENTS

- A. Mullion depths must remain constrained to depths within 1/2-inch as indicated on Drawings; provide engineering and internal reinforcement as required to remain no greater than these constraints; coordinate allowed variation from Drawing depths with related trades.
- B. System to be factory prepared with the components factory cut for the Project; cutting within the installers shop will not be accepted. Contractor has the option of having the framing fully fabricated by the manufacturer for field glazing.

1.3 RELATED REQUIREMENTS

- A. Section 07 84 00 Firestopping: Firestop at system junction with structure.
- B. Section 07 90 05 Joint Sealers: Perimeter sealant and back-up materials.

1.4 REFERENCE STANDARDS

- A. AAMA CW-10 Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.
- B. AAMA 501.2 Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2009 (part of AAMA 501).
- C. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- D. AAMA 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 2009.
- E. ASCE 7 Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.
- F. ASTM A36/A36M Standard Specification for Carbon Structural Steel; 2008.
- G. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- H. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- I. ASTM B209M Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
- J. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2012.

- K. ASTM B221M Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2012.
- L. ASTM C794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2010.
- M. ASTM C1184 Standard Specification for Structural Silicone Sealants; 2005.
- N. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- O. SSPC-Paint 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- 1.5 PERFORMANCE REQUIREMENTS
 - A. Design and size components to withstand the following load requirements without damage or permanent set:
 - 1. Design Wind Loads: Comply with requirements of IBC International Building code.
 - 2. Member Deflection: Limit member deflection to flexure limit of glass in any direction, and maximum of 3/4 inch, with full recovery of glazing materials.
 - 3. Measure performance by testing in accordance with ASTM E 330, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
 - B. Movement: Accommodate the following movement without damage to components or deterioration of seals:
 - 1. Movement of curtain wall relative to perimeter framing.
 - 2. Deflection of structural support framing, under permanent and dynamic loads.
 - C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E 283.
 - D. Condensation Resistance Factor: CRF of 67 when measured in accordance with AAMA 1503.1.
 - E. Thermal Resistance of Exterior Framing: Thermal transmittance U value not more than 0.38 BTU/HR/FT²/°F when measured in accordance with AAMA 1503.1.
 - F. Water Leakage: None, when measured in accordance with ASTM E 331 at a test pressure difference of 15 lbf/sq ft.
 - G. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - H. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 - I. Design system to eliminate noises caused by wind and thermal movement, to prevent vibration harmonics, and to prevent "stack effect" in internal spaces.

1.6 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glazing and infill, internal drainage details .

- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
 - 1. Shop drawings must be prepared by the manufacturer, under the supervision of a Professional Structural Engineer registered in the State of Maryland.
 - 2. Shop drawings must be signed and sealed by the supervising Professional Structural Engineer registered in the State of Maryland.
- D. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
- E. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations.
 - 1. Engineering calculations ust be signed and sealed by the supervising Professional Structural Engineer.
- F. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- G. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
- H. LEED Submittals: Provide VOC content documentation for field-applied sealants and primers; comply with VOC content limits of Section 01 61 16.
- I. Report of field testing for water leakage.
- J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.7 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State of Maryland.
- B. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum five years of documented experience.

1.8 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.
- 1.9 DELIVERY, STORAGE, AND HANDLING
 - A. Handle products of this section in accordance with AAMA CW-10.
 - B. Protect finished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.10 FIELD CONDITIONS

- A. Contractor is responsible for coordination of dimensions and field measurements required by trade contractors.
- B. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.11 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a 10 year period after Date of Substantial Completion.
- C. Provide 10 year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.
- D. Warranty for all components must be direct from the manufacturer (non pass-through) and non pro-rated for the entire term.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. EFCO, a Pella Company; Product System 5600 with Duracast Fiberglass Pressure Plates (Basis-of-Design).
 - B. Kawneer North America; Product 1600UT Wall System: www.kawneer.com.
 - C. YKK AP America; Product YCW 750 XT: www.ykkap.com.

2.2 CURTAIN WALL

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 2. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 - 3. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

2.3 COMPONENTS

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Outside glazed, with pressure plate and mullion cover.
 - 2. Include several profiles for exterior covers as indicated; no variation in snap cover design is permitted.
 - 3. Finish: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
- B. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 - 1. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member, where required by system designer.
- C. Glazing: As specified in Section 08 80 00.
- D. Fiberglass Pressure Plates or equivalent material by named manufacturers.
- E. Column Covers: Aluminum, 0.063 inch thick, finish to match curtain wall framing members.

2.4 MATERIALS

- A. Recycled Content: Provide aluminum with minimum 30 percent recycled content and steel with minimum 30 percent recycled content.
- B. Extruded Aluminum: ASTM B221 (ASTM B221M).
- C. Sheet Aluminum: ASTM B209 (ASTM B209M).
- D. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- E. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
- F. Fasteners: Stainless steel.
- G. Exposed Flashings: 0.063 inch thick aluminum sheet; finish to match framing members.
- H. Concealed Flashings: 0.018 inch thick stainless steel.
- I. Firestopping: As specified in Section 07 84 00.
- J. Structural Glazing Adhesive: Silicone, neutral cure; formulated specifically for structural sealant glazing and complying with ASTM C1184.
 - 1. Ultraviolet radiation resistant for 2000 to 4000 micro-watts minimum for 21 days.
 - 2. Adhesion when subjected to ultraviolet radiation through glass in accordance with ASTM C794 without failure.
 - 3. Minimum adhesion tensile strength of 100 psi.
 - 4. Tested for compatibility with glazing accessories and weatherseal sealant.
 - 5. Adhesives applied within the building waterproofing envelope: Comply with low-emitting requirements specified in Section 01616.
- K. Weatherseal Sealant: Silicone, same type as glazing adhesive.
- L. Perimeter Sealant: Type ES-1 or ES-4 specified in Section 07900 and Section 01616.
- M. Glazing: As specified in Section 08 80 00.
- N. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- O. Glazing Accessories: As specified in Section 08 80 00.
- P. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.
- 2.5 FINISHES
 - A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating or AAMA 612 electrolytically deposited colored anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.
- 2.6 FABRICATION
 - A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
 - B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
 - C. Prepare components to receive anchor devices. Fabricate anchors.
 - D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
 - E. Arrange fasteners and attachments to conceal from view.

- F. Reinforce framing members for imposed loads.
- G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
 - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

3.2 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- H. Install firestopping at each floor slab edge.
- I. Install operating sash.
- J. Pressure Plate Framing: Install glazing and infill panels in accordance with Section 08 80 00, using exterior dry glazing method.
- K. Install perimeter sealant in accordance with Section 07 90 05.
- L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.3 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. Test installed curtain wall for water leakage in accordance with AAMA 501.2.
 - 1. Test a minimum area of 75 feet by 1 story of aluminum-framed systems designated by Architect, before installation of interior finishes; test area may not show evidence of water penetration.

B. Replace curtain wall components that have failed field testing and retest until performance is satisfactory.

3.5 ADJUSTING

A. Adjust operating sash for smooth operation.

3.6 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

3.7 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION

SECTION 08 56 74 - ACOUSTICALLY RATED CONTROL ROOM WINDOWS

PART 1 GENERAL

- 1.1 SCOPE
 - A. Provide acoustically rated operable window and frame assemblies as specified herein and as shown on the Drawings. Furnish windows, frames, and hardware as a complete assembly from the window manufacturer and ship for installation by field personnel licensed by the manufacturer.

1.2 RELATED SECTIONS

- A. Division 3 Precast Concrete Panels
- B. Division 4 Unit Masonry
- C. Division 7 Acoustical Sealant
- D. Division 8 Glass and Glazing
- E. Division 9 Gypsum Wallboard Assemblies, Painting
- F. Division 13 Architectural Acoustic Isolation

1.3 REFERENCES

- A. American Society for Testing and Materials:
 - 1. E90-97 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss through Building Partitions.
 - 2. E336-97 Standard Test Method for Measurement of Airborne Sound Insulation in Buildings
 - 3. E413-87 Classification for Rating Sound Insulation
- 1.4 SYSTEM PERFORMANCE REQUIREMENTS
 - A. Comply with applicable federal, state, and local codes.
 - B. Test window/frame assemblies in accordance with ASTM E90 for classification under ASTM E413 to ratings required by the Construction Documents.
 - C. Provide operable, double-track horizontal sliding windows with a minimum rating of STC 35.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Supply acoustically rated windows and frames from a single manufacturer with minimum experience of 10 years in fabricating similar assemblies.
- B. Install acoustically rated window assemblies with manufacturer's own personnel or with installers trained and licensed by the window manufacturer. In the latter case, provide manufacturer's field representative to oversee the installation of the windows.
- C. Acceptance Testing: Following installation and adjustment of gaskets, perform Noise Reduction measurements on all acoustically rated window assemblies to demonstrate that the specified performance standards have been met or exceeded. An independent, qualified laboratory or acoustics consultant shall perform these tests. The costs for these measurements shall be the responsibility of the contractor. The contractor shall submit the results of the tests to the Architect prior to final acceptance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect windows and frames from weather and from damage during shipping and storage. Follow manufacturer's recommendations for protection and prevention of wracking and damage to windows, frames, and seals.
- B. Inspect windows upon delivery for damage and defects. Superficial damage may be repaired to the Architect's acceptance. Replace sash and frames that are found to be distorted.

1.7 SUBMITTALS

- A. Submit manufacturer's data, shop drawings, and product performance certifications in accordance with Division 1.
- B. Manufacturer's Data: Submit technical product data confirming that products comply with specified requirements:
 - 1. Illustrations and descriptions of components including, but not limited to sash, frames, seals, hardware, and anchors.
 - 2. Operation and maintenance instructions.
- C. Shop Drawings
 - 1. Full-size details of frames indicating head, jamb, and sill conditions including seals, anchors, reinforcing and material finishes.
 - 2. Full size details of sash and glazing construction.
 - 3. Substrate construction required of other subcontractors.
 - 4. Schedule of windows with reference numbers that match or are cross-referenced to those indicated on the Drawings.
- D. Samples: 18-inch square mock-up of corner condition of complete assembly, including glass, glazing, sash, frame, and seals.
- E. Certifications:Provide the following:
 - 1. Certified laboratory test reports from an independent acoustics testing laboratory demonstrating compliance of an operating window assembly with ASTM E90-97 for the specified STC rating. Provide such data for each type of acoustically rated window assembly specified for the project. Test data may not be more than 5 years old.
 - 2. Written reports of at least two separate field tests of installed windows demonstrating that comparable installations have met or exceeded Noise Isolation Class (NIC) 30. NIC testing must comply with ASTM E336-97 test methods.
 - 3. Supervision plan for manufacturer's representative in the field during installation of acoustically rated windows.

1.8 WARRANTY

A. Warrant acoustically rated window assemblies including sash, glass, glazing, frames, and hardware against defects in materials and workmanship for two years from Final Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Mon-Ray, Inc. (DeVac), Mineapolis, MN
- B. Wausau Window and Wall Systems, INvent Series, Wausau, WI
- C. Noise Barriers, LLC, Libertyville IL

2.2 MATERIALS

- A. Frames: Painted aluminum or steel or as shown on the drawings
- B. Perimeter seals: Silicone or closed-cell neoprene to meet performance requirements
- C. Hardware: Manufacturer's standard latches, handles, and mounting brackets.
- D. Glass and Glazing: Single-glazed system with laminated glass for acoustically rated windows, factory assembled with wet seal or resilient gasketing suitable for maintaining the specified STC rating.

2.3 FABRICATION

- A. Sash and Frames
 - 1. Miter corners and reinforce as required to prevent distortion of the installed system.
 - 2. Fit Sash to frame so that seals are slightly compressed and light- and air-tight. Force required to move the sash shall not exceed 15 punds applied at the sash handle.
- B. Acoustic Seals
 - 1. Install each gasket as a single, continuous length on each edge of sash and frame. Use multiple gaskets as required to achieve performance requirements. Miter corners to provide continuous seal.
- C. Glass and Glazing
 - 1. Install glass using resilient neoprene or silicone gaskets with mitered and welded corners and with glazing stops secured by flush or concealed fasteners. Construction is to allow for replacement of glass and gaskets without damage to the sash and frame.

PART 3 EXECUTION

3.1 PREPARATION

A. Before commencing installation examine the substrate and surrounding conditions to insure that there is nothing to prevent proper and timely execution of the installation. Beginning work specified in this Section shall indicate acceptance of the substrate and surrounding conditions.

3.2 INSTALLATION

- A. Install windows and frames plumb, straight, and square in proper elevation, plane, and location.
- B. Install windows in accordance with manufacturer's recommendations using installers trained and licensed by the manufacturer.
- C. Solidly pack frames with 6 to 12pcf mineral wool insulation or grout as required to achieve the specified rating at each opening.
- D. Install and adjust to achieve continuous air- and light-tight seal around entire perimeter of sash.
- E. Install resilient sealant between frame and wall construction in accordance with Division 7 Acoustic Sealants.
- F. All work shall be complete in every detail, and the finished work shall be clean for the Architect prior to final acceptance

3.3 CLEANING AND ADJUSTMENT

A. Provide final adjustment of closers, hardware, and seals just prior to acceptance testing.

3.4 ACCEPTANCE TESTING

- A. Prior to Final Completion, provide acceptance testing of each acoustically rated window assembly. Testing services shall be provided by a qualified independent acoustics testing laboratory or by an acoustics consultant with membership in the National Council of Acoustics Consultants. Acceptable installations will meet or exceed a Noise Isolation Class (NIC) which is not more than 5 points below the specified STC rating. Conduct measurements in accordance with ASTM E336-97.
 - 1. Conduct testing with the Project Acoustics Consultant present.
 - 2. Provide a report of testing procedures and results for review by Project Acoustics Consultant who will review and return the report to the Architect with recommendations.
- B. Remediation: Failure of any window to achieve the required performance will require the following procedure to be followed:
 - 1. Scan the gaskets with a precision sound meter while the broad band source is operating on the opposite side and, if necessary, adjust the gaskets so that deviations of A-scale values at 6" from the gaskets are not more than 4 dBA greater than A-scale values measured 6" away from the center of the window.
 - 2. If the perimeter gaskets pass or are adjusted to pass the above scanning test and the specified NIC values are still not achieved, the Architect or Owner may request that a flanking check be made. This may involve taping of all gasketed joints using a special adhesive tape and/or the installation of plywood or some other barrier material in front of the windows to upgrade the acoustic performance of the openings for purposes of measurement as designated by the Project Acoustics Consultant.
 - 3. If the flanking test assembly achieves the specified NIC values, the installing contractor shall be responsible for the cost of taping and whatever additional adjustments, modifications and tests are necessary to meet the specified NIC values for the fully operating assembly.
 - 4. If the modified assembly does not yield the specified NIC values, either flanking or panel deficiency is thereby shown to be limiting. In this instance the Architect, Owner, Acoustician and General Contractor shall determine appropriate corrective measures to eliminate the flanking paths and shall determine the responsibilities both for corrections and costs of testing and re-testing. The installing contractor shall not be responsible for the acoustic performance of the surrounding construction if it is found to provide less noise reduction performance than the specified NIC performance.
 - 5. If, after removing the tape, specified values are no longer met, the installing contractor shall be responsible for all modifications and subsequent re-testing fees and expenses until the operating assemblies perform as specified.
- C. Reporting: Submit to Architect a final report documenting test procedures and results. Include record of microphone placement during the tests. Provide drawings and text documentation, as appropriate, of modifications required to achieve the specified NIC ratings.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Door hardware and related accessories.
- B. Security system hardware items and coordination.

1.2 RELATED REQUIREMENTS

- 1. Division 8 Section "Hollow Metal Doors and Frames".
- 2. Division 8 Section "Flush Wood Doors".
- 3. Division 8 Section "Aluminum-Framed Storefronts."
- 4. Division 26 Sections for line voltage wiring and power requirements.
- 5. Division 28 for access control devices installed at door openings provided as part of an electronic security access system, and for connections to building fire alarm system.

1.3 REFERENCE STANDARDS

- A. The publications listed below, including the amendments, addenda and designated changes, form a part of this specification to the extent referenced.
 - 1. Federal Specifications (FS): FF-H-111C-74 Hardware, Builders Shelf and Miscellaneous.
 - 2. National Fire Protection Association (NFPA):
 - a. Standard 70, National Electric Code.
 - b. Standard 80, Fire Doors and Windows.
 - c. Standard 101, Life Safety Code.
 - d. Standard 252, Standard Methods of Fire Tests of Door Assemblies.
 - 3. American National Standards Institute (ANSI):
 - a. A156.6, Architectural Door Trim.
 - b. A156.18, Materials and Finishes.
 - 4. International Code Council: International Building Code (IBC).
 - 5. Americans with Disabilities Act (ADA): Standards for Accessible Design.
 - 6. Door and Hardware Institute (DHI):
 - a. Abbreviations and Symbols.
 - b. Keying Systems and Terminology.
 - c. Recommended Locations for Builder's Hardware for Custom Steel Doors and Frames.
 - 7. Underwriters Laboratories, Inc. (UL): UL-BMD, Building Materials Directory.

1.4 SUBMITTALS

- A. Comply with provisions of Division 1 Section "Administrative Requirements".
- B. Sustainable Design 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. Include statement indicating costs for each product having recycled content.
 - 2. Credit MR 5.1 and 5.2: List of proposed regionally manufactured materials and regionally extracted, harvested, or recovered materials.
 - a. Identify each regionally manufactured material, its source, and cost.
 - b. Identify each regionally extracted, harvested or recovered material, its source, and cost.
 - c. Include map or other similar documentation, confirming the following:

- 1) Driving distance between location of manufacture and Project site.
- 2) Driving distances between location of extraction, harvesting, or recovery, and Project site.
- C. Qualification Data: Submit supplier and installer qualifications verifying years of experience and hardware manufacturers' certifications; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.
- D. Hardware Schedule: Submit a door hardware schedule in the manner and format prescribed and used herein, complying with the actual construction progress. Hardware schedules are intended for coordination of the work. Review and acceptance by the Architect or Owner does not relieve the Contractor of his exclusive responsibility to fulfill the requirements as shown and specified.
 - 1. Hardware Schedule Content: Based on hardware indicated, organize hardware schedule into Sets or sets showing complete designations of every item required for each door opening. Schedule shall be vertical layout similar to the format used herein. Lines shall be double spaced with pages numbered and dated.
 - a. For doors of different sizes or where hinges, locks or closers are different, a separate heading shall be used. No labeled openings shall be combined with non-labeled openings. Horizontal hardware schedules are not acceptable. Include the following:
 - 1) Number, location, hand, fire rating, size and material of each door opening (hands and swings to be determined in relation to key side of opening).
 - 2) Type, style, function, size, finish and quantity of each hardware item.
 - 3) Name and manufacturer of each item.
 - 4) Fastening requirements.
 - 5) Explanation of abbreviations used (use nomenclature consistent with DHI's "Abbreviations and Symbols" wherever possible).
 - 6) Special mounting locations and instructions.
 - b. Combined submittals are not acceptable. Do not combine hardware schedules with door and frame shop drawings.
 - c. Schedules not adhering to these parameters will not be reviewed.
 - 2. Hardware Schedule Index: Furnish an index cross referencing Contract Document door number and Hardware Set, and supplier's hardware set.
- E. Product Data:
 - 1. Submit copies of manufacturers' specifications, maintenance and keying manuals, and installation instructions for each item of door hardware.
 - 2. Include photographs, catalog cuts, marked templates and other data as may be required to show compliance with these Specifications.
- F. Samples:
 - 1. Submit full size hardware samples as requested by the Architect.
 - 2. Items shall remain on file in the Architect's office until all other similar items have been installed in the project. At that time, items on file will become Owner Maintenance Stock.
- G. Templates: Provide necessary templates and/or physical hardware to all trades or factories requiring them so they may cut, reinforce or otherwise prepare their material or product to receive the hardware item. If any manufacturer requires physical hardware, ship to them such hardware via prepaid freight in sufficient time to prevent any delay in the execution of their work.
- H. Keying Schedule: Detailed keying system schedule, indicating Owner's approved keying system, for Owner's review and approval. Include the following:
 - 1. Schematic keying diagram

- 2. Index identifying each key set to unique door designations.
- 3. Bitting list.
- I. Wiring Diagrams: After Hardware Schedule has received Architect's approval; submit the following:
 - 1. Diagrammatic details of electrified door hardware. Include fire alarm and/or access control system interface where applicable. Diagrams shall be complete by opening and shall indicate connections between all components affected. Manufacturers' standard line diagrams are not acceptable. Include the following:
 - a. System schematic.
 - b. Point-to-point wiring diagram.
 - c. Riser diagram.
 - d. Elevation of each door.
 - 2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.
- J. Operations and Maintenance Data: Furnish two copies of the Operation and Maintenance manual. The manual shall consist of a hard cover and three-ring binder with the project name on the front. Include the following:
 - 1. Maintenance instructions for each item of hardware supplied.
 - 2. Copy of the final Door Hardware Schedule.
 - 3. Catalog cuts for all items scheduled.
 - 4. Names and phone numbers of the factory representatives for each item supplied.
 - 5. Copy of the final Keying Schedule.
 - 6. Include any specialized tools needed to maintain the hardware.
- K. Warranty: Special warranties specified in this Section.
- 1.5 QUALITY ASSURANCE
 - A. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
 - B. Contractor: Assign the installation of hardware to tradesmen experienced in the installation of commercial door hardware.
 - 1. Hardware Installers shall be trained and certified by the Lock, Door Closer, and Exit Device Manufacturers
 - C. Supplier Qualifications:
 - 1. Supplier shall be a recognized architectural door hardware supplier, with warehousing facilities, who has been furnishing hardware in the Project's vicinity for a period of not less than two years.
 - a. Supplier's responsibilities include supplying and installing door hardware. Supplier must employ an Architectural Hardware Consultant who shall be available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware.
 - b. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 - 2. Architectural Hardware Consultant Qualifications: A person who is currently certified by DHI as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
 - D. Accessibility for Disabled Persons: Special hardware requirements for knurling, slow acting closers or other barrier free opening requirements shall be provided as indicated in the Door

Hardware Sets and as required to comply with the U.S. Department of Justice's "ADA Standards for Accessible Design".

- E. Hardware for Fire Doors and Exit Doors: Hardware for fire doors shall conform to NFPA 80; hardware for exit doors shall conform to NFPA 101. Other requirements specified shall also apply. Such hardware shall comply with the applicable UL standards for the intended use specified and be listed in UL BMD, or be labeled and listed by another testing laboratory deemed acceptable by the Owner and Architect.
 - 1. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
 - a. Test Pressure: After five minutes into the test, neutral pressure level in furnace shall be established at 40" or less above the sill.
- F. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- G. Keying Conference: Conduct conference at Project site. In addition to Owner, Contractor, and Hardware Supplier's Architectural Hardware Consultant, conference participants shall also include Hardware Installer.
 - 1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
 - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.
- H. Pre-Installation Conference: Conduct conference at Project site. Review methods and procedures related to electrified door hardware including, but not limited to, the following:
 - 1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
 - 2. Review sequence of operation for each type of electrified door hardware.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review required testing, inspecting, and certifying procedures.
- I. Reference Standards: Except as otherwise required by governing authorities or Contract Documents, comply with applicable provisions of Door and Hardware Institute.

1.6 PRODUCT DELIVERY

- A. Deliver door hardware to the Contractor. Direct factory shipments (drop shipments) to the job site are not acceptable.
 - 1. Deliver items of hardware at the proper times to the proper locations (shop or project site) in their original individual containers, complete with necessary appurtenances including screws, keys, manufacturers' printed instructions, and where necessary, installation templates for manufacturer's suggested installation. Mark each individual container with the manufacturer's name and catalog number as they appear in the hardware schedule.
- B. Representatives of the Contractor and the Hardware Supplier shall jointly inventory the door hardware. Replace items damaged in shipment promptly and with proper material without additional cost to the Contractor. Handle all hardware in a manner to eliminate marring, scratching or damage.
- C. Keys and Cores:

- 1. Supply construction master keys and cores to Contractor when cylinders are delivered, for use during construction.
- 2. Prior to the scheduled completion of the project, manufacturer shall ship all permanent keys and cores, including permanent control keys, directly to the Owner via Registered Mail, Return Receipt Requested or other pre-approved means. Under no circumstance shall any permanent keys or cores be furnished direct to the Contractor.
- D. Key Cabinet: Deliver key cabinet to the Owner prior to building occupancy.
- 1.7 WARRANTIES
 - A. Warranties shall be furnished in accordance with Division 1. Materials furnished under this Section shall be warranted to be free from defects in material and workmanship for a period of one year from substantial completion of the Project.
 - 1. Exceptions:
 - a. Locksets and exit devices shall be warranted for a minimum of five years from date of manufacture.
 - b. Surface closers and continuous hinges shall be warranted for a minimum of ten years from date of manufacture.
 - 2. Installation workmanship shall be warranted for a period of one year after Final Acceptance.

1.8 EXTRA MATERIALS

A. Furnish three dozen extra screws and other fasteners of each size, type and finish used. Deliver extra screws and fasteners to the Hardware Installer for use during installation. All unused screws and fasteners, and all special installation tools furnished with the hardware, shall be turned over to the Owner at the completion of the job.

PART 2 - PRODUCTS

2.1 TEMPLATE HARDWARE

A. Hardware to be applied to metal or pre-finished doors and frames shall be made to template. Coordinate hardware locations to prevent interference with other hardware items.

2.2 HARDWARE ITEMS

- A. All hardware shall be clearly and permanently marked by the manufacturer where it will be visible after installation.
- B. Butt Hinges: Hager Companies, McKinney Products Company or Stanley Hardware.
 - 1. Butt hinges shall be Hager BB1279 Series, McKinney TB2714 Series or Stanley FBB179 Series.
 - 2. Furnish two hinges for doors 60" or less in height and one additional hinge for each additional 30" of height or fraction thereof.
 - 3. Unless otherwise specified, hinges for doors through 36" wide shall be 4.5" x 4.5"; hinges for doors over 36" wide shall be heavyweight 5" x 4.5".
 - 4. All butt hinges shall have five knuckles. Furnish non-removable pins (NRP) for all reverse bevel doors receiving keyed locks, rigid outside trim or exit only hardware. Provide hinges with holes in the bottom plug to facilitate pin removal.
 - 5. Hinges for labeled doors shall comply with the requirements of NFPA 80.
- C. Continuous Hinges: Hager Companies, Ives or McKinney Products Company.
 - 1. Geared extruded aluminum leafs with interlocking cover and nylon bearings, full door height.
 - 2. Fire rated hinges are to be certified by UL, with embossed stamping.

D. Cylinders:

- 1. Provide cylinders for locksets, deadlocks, exit devices, and all other locking devices indicated in Hardware Sets.
- 2. Description:
 - a. Cylinders shall be 7-pin interchangeable core type with cores removable by special control key.
 - b. Cylinder parts manufactured from brass, bronze, stainless steel, or nickel silver.
 - c. Equip all cylinders with brass color-coded, temporary cores for use during construction and for testing the hardware; plastic cores are prohibited.
 - d. Include all necessary extensions, cams, tail pieces and hardened collars required for a complete installation.
- 3. Acceptable Manufacturers:
 - a. Keymark by Medeco Security Lock.
 - b. Provide scheduled products. The products scheduled shall be used to the exclusion of all others and no other products will be considered to be equal
- E. Locks and Latches: Arrow Lock & Door Hardware, Corbin Russwin Architectural Hardware or Sargent Manufacturing Company.
 - 1. Locks and latches shall be equal to Corbin Russwin ML2000 Series with NSM trim.
 - 2. All internal working parts shall be brass, bronze, steel or stainless steel. For each lock and latchset, provide strike box and square corner ASA strike with curved lips of sufficient length to protect frames.
 - a. Furnish knurling to lever on corridor side of door to all doors leading to hazardous areas (e.g. Mechanical Rooms, Electrical Rooms, Elevator Machine Rooms, etc.).
 - 3. Furnish keyed devices with cylinders keyed to building system.
- F. Exit Devices Accessories: Precision Hardware, Inc., Sargent Manufacturing Company or Von Duprin, Inc.
 - 1. Exit devices shall be Precision Apex Series, Sargent 80 Series or Von Duprin 98 Series.
 - 1. Refer to the Hardware Set Schedule for grade and function.
 - 2. Where lever handle functions are required on exit devices, they shall match the design and construction of lever handles specified for mortise locks.
 - a. At mortise exit devices, provide strike box and square corner, stainless steel ASA strike with curved lips of sufficient length to protect frames.
 - 3. Furnish keyed devices with cylinders keyed to building system.
 - 4. Provide UL-labeled fire-exit hardware at fire-rated openings.
- G. Surface Closers: Corbin Russwin Architectural Hardware, LCN Closers or Sargent Manufacturing Company.
 - 1. Surface closers shall be Corbin Russwin DC8000 Series, LCN 4040XP Series or Sargent 281 Series. Closer arms shall be forged and fluid shall accommodate all applicable weather conditions.
 - a. At parallel arm installations, provide manufacturer's heaviest-duty arm assembly.
 - 2. Where factory sized closers are specified, sizes are to be determined by manufacturer's recommendations for door size, location and applicable handicap requirements.
 - 3. Locate surface closers on the least conspicuous side of the door (side opposite public view).
- H. Low Energy Operators: LCN Closers, Nabco Entrances (Gyro-Tech), Inc. or Stanley Access Technologies.
 - 1. Operators shall be of heavy-duty construction. Sizes are to be determined by manufacturer's recommendations for door size and location.

- 2. Operation:
 - a. Pressing actuator switch automatically opens door leaf to 90-degrees, operator then manually closes door after variable time delay expires.
 - b. Provide wall- and jamb-mounted stainless steel actuator plates as indicated. Hardwired actuators shall operate on voltage provided by operator.
 - 1) Engrave Universal Accessibility Symbol on plate; fill with blue enamel paint.
- 3. Control Unit:
 - a. Micro-processor controlled.
 - b. Provide adjustable opening speed, adjustable backcheck speed, adjustable closing speed, and adjustable hold-open period.
 - c. Include built-in 3-position switch for "OFF", "ON" and "HOLD-OPEN" operation and to deactivate actuator switches.
 - d. Provide safety-stop feature: If object or obstruction is encountered during opening and/or closing cycles, door operator stops and slowly returns to closed or open position respectively.
 - e. Provide with safety circuit so that if actuator switch is activated when door is latched or locked, power operator resets without operator and/or door damage.
- 4. Accessories: Furnish complete with fastenings, fittings, and other accessories as required for a complete installation.
- 5. Manufacturer shall provide detailed wiring diagrams showing point-to-point hook-up of all components affected (e.g. operators, actuators, power, etc.).
- 6. Coordinate electrical connection and installation with Division 16.
- I. Architectural Door Trim: Hager Companies, Ives or Rockwood Manufacturing Company.
 - 1. Protection Plates: Beveled on all sides, equal to Hager #194S Series.
 - a. Unless otherwise indicated in the Hardware Set Schedule, or where narrow bottom rails dictate a smaller size, armor plates shall be 34" high, kick plates shall be 8" high and mop plates shall be 6" high.
 - b. Armor plates and kick plates shall be 2" less than the door width on single doors and 1-1/2" less than the door width on double doors, mop plates shall be 1/2" less than the door width on all doors.
 - c. Armor plates on labeled doors shall comply with the requirements of NFPA 80.
 - d. Where required, factory-prepare flat goods for cylinders and turn pieces.
 - 2. Push/Pull Plates: Beveled on all sides, fabricated from 1/8" thick stainless steel
 - a. Except where narrow door stiles dictate a smaller size, push and pull plates shall be 8" wide by 16" high.
 - b. Pull plates shall be 4" wide by 16" high.
 - 3. Door Pulls: Fabricate pull bars from solid stainless steel bar stock. Provide a minimum 2-1/4" clearance; 10" center-to-center.
 - 4. Push and Pull Bars:
 - a. Fabricate push and pull bars from solid stainless steel bar stock. Provide units complete with spacers threaded to accept concealed through bolt attachment including provision for spanner tightening of bolts and assembly. Do not furnish grommets at stile/pull interface.
 - b. Refer to the Hardware Set Schedule for style and design.
 - 5. Fasteners: All flat goods shall be furnished with Phillips undercut, countersunk screws per ANSI A156.6. Trusshead screws are not acceptable.
- J. Auxiliary Hardware: Hager Companies, Ives or Rockwood Manufacturing Company.

- 1. Stops: Furnish wall stops equal to Rockwood #400 wherever door strikes wall. Where wall stops are not suitable, furnish floor stops equal to Rockwood #441CU (with removable riser).
- 2. Manual Flush Bolts: Top manual flush bolts shall not exceed 74" from floor to centerline.
- 3. Silencers: Provide rubber silencers equal to Rockwood #608. Furnish three per single door and four per pair. Silencers are not required at aluminum frames or at doors specified to receive continuous seals or weather-stripping.
- K. Overhead Holders and Stops: Glynn-Johnson or Rixson.
 - 1. Where wall or floor stops will not work, furnish surface-mounted overhead stops equal to Glynn-Johnson #90S.
- L. Thresholds, Weather-stripping and Seals: National Guard Products, Inc., Pemko Manufacturing Company or Zero International.
 - 1. Refer to the Hardwar Set Schedule for grade and style.
 - 2. Smoke Seals: At all fire-rated wood doors, all 20-minute rated doors, and any other doors required to be 'smoke resistant', provide the following:
 - a. Head and Jambs: Smoke seals equal to National Guard #5050C.
 - b. Meeting Stile at Pairs: Astragal seals equal to one National Guard #5070C or two National Guard #156S as appropriate for intended hardware operation.
 - c. Refer to the Drawings for required locations.
 - 3. Where required, field-modify thresholds to receive strikes for exit devices and flush bolts.
- M. Key Control System: Lund Key Cabinets, MMF Industries or TELKEE, Inc.
 - 1. Wall-mounted metal cabinet with baked-enamel finish; containing key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150% of the number of cylinders required herein.
 - a. Equip cabinet with hinged-panel door, key-holding panels, and pin-tumbler cylinder door lock.
 - b. Cross-Index System: Multiple-index system for recording key information. Include three receipt forms for each key-holding hook.
- N. Fire Department Access Vault: Knox Company.
 - 1. Basis of Design: Recessed-type, Series 3200 "Knox Box".
 - 2. Size: 5" wide by 4" high by 3" deep; 7" by 7" outside dimension of recessed mounting flanges.
 - 3. Finish: Weather-resistant TGIC polyester powder coat; color as selected by Architect.
 - 4. Include mounting kit for recessed installation in masonry construction.
- O. Electromagnetic Door Holders: LCN Closers, Rixson or Sargent Manufacturing Company.
 - 1. See details for size and shim requirements.
 - 2. Coordinate electrical connection and installation with Division 16.
- P. Magnetic Locks and Accessories: Schlage Electronics, Securitron Magnalock or Security Door Controls.
 - 1. Units shall operate at 24V current with a minimum holding force of 1200-pounds and built-in electronics to eliminate residual magnetism and provide transient suppression.
 - 2. Coordinate electrical connection and installation with Division 16.
- Q. Magnetic Door Contacts: GE Security (Sentrol).
 - 1. Magnetic door contacts shall be GES #1078C.
 - 2. Provide built-in, end of line resistors as required by the Electronic Security Control System.
 - 3. Coordinate electrical connection and installation with Division 16.

R. Special Tools: Provide any necessary special tools (e.g. spanner and socket wrenches, dogging keys, etc.) required to service and adjust hardware items

2.3 HARDWARE FINISHES

- A. Base metals: Produce hardware units of basic metal and forming method indicated, using manufacturers standard metal alloy composition, temper and hardness, but in no case of lesser quality than specified or inferred by use of a particular manufacturer's number, style or grade or as established by appropriate referenced specification listed herein.
- B. Finishes: Finishes shall conform to the 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 the standards established by ANSI/BHMA A156.18 or Federal Specifications FF-H-111C as applicable.
 - 1. All exposed hardware except surface closers and butt hinges shall be satin stainless steel, ANSI/BHMA 630/US32D.
 - a. Factory-finish surface closers to match satin stainless steel.
 - b. Butt hinges at exterior doors and doors in wet areas shall be satin stainless steel; butt hinges at all other doors shall be satin chrome plated, ANSI/BHMA 652/US26D.
 - c. Continuous geared hinges shall have a clear anodized finish.
 - d. Items of hardware not available in stainless steel shall be furnished with a stain chrome finish.
 - 2. Where painting of primed surfaces is required, refer to Division 9 specifications.
- 2.4 KEYING
 - A. Key System: Provide the type of system required (e.g. master, grand master, great grand master); nomenclature and layout to be consistent with DHI "Keying Systems and Terminology".
 - 1. Keying is the responsibility of the Contractor; and shall be performed by the cylinder supplier.
 - 2. All cylinders shall be keyed to the existing Baltimore County Public Schools master key systems.
 - 3. Key System Summary, Cover Sheet, and Letter of Authorization shall accompany Keying Schedule and Purchase Order sent to Factory.
 - B. Keys: Provide keys of nickel silver only in the following quantities:
 - 1. Grand Master Keys: Five.
 - 2. Master Keys: Five per system.
 - 3. Change Keys: Four per lock.
 - 4. Construction Master Keys: Twelve.
 - 5. Control keys (for removal of cores): Five permanent and three temporary.
 - C. Identification: Stamp permanent keys and cores with the applicable key mark for identification. These visual key control marks or codes shall not include the actual key cuts. Stamp change keys with the key change number; stamp all master keys and grand master keys "DO NOT DUPLICATE".

2.5 FASTENERS

- A. Manufacture hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping or sheet metal screws except as specifically indicated.
 - 1. All hardware shall be installed using screws and attachments furnished with the hardware; no other screws or attachments and acceptable. Provide Phillips flat head or oval head

screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such work as closely as possible, except as otherwise indicated.

- a. Where wood screws are required they shall be full thread (to the head) type. Combination wood/machine screws, in lieu of wood screws, are not acceptable.
- b. Provide self-tapping fasteners for weather-stripping and seals applied to hollow metal frames.
- 2. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard manufactured units of the type specified are available with concealed fasteners.
 - a. Closers and exit devices installed on wood doors shall be furnished with thru-bolts and back-plates fabricated from stainless steel or aluminum, with a brushed or satin finish. Provide plates with beveled edges, of matching size to closers and devices.
- 3. Furnish fasteners which are compatible with both the unit fastened and the substrate, and which will not cause corrosion or deterioration of hardware, base material reinforcement or fastener. Furnish wall stops with "Toggler" anchors and wood screws. Furnish thresholds and floor stops with lead anchors and 1/4-20 stainless steel machine screws.

PART 3 - EXECUTION

3.1 STORAGE AND HANDLING

- A. Representatives of the Contractor and the Hardware Supplier shall jointly inventory the door hardware. Replace items damaged in shipment promptly and with proper material without additional cost to the Contractor. Handle all hardware in a manner to eliminate marring, scratching or damage.
 - 1. A dry, locked storage space complete with adequate shelving shall be set aside for the purpose of unpacking, sorting out, checking and storage. Control the handling and installation of hardware items, whether immediately replaceable or not, so completion of the work will not be delayed by losses before or after installation.
 - 2. Tag each item or package separately, with identification related to the final approved hardware schedule, and include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of thickness, profile, swing, security and similar requirements indicated as necessary for proper installation and function.

3.2 COORDINATION

- A. Coordinate Door Hardware Schedule submission and hardware ordering to insure delivery of all items as directed by the Contractor.
 - 1. Prior to ordering any hardware, examine the shop drawings and details of doors and frames and other substrate suppliers to determine that the proper type and size pieces of hardware are being furnished. No extra for material or labor will be allowed for any corrections that should have been eliminated by proper prior coordination.
- B. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, and access control system.

3.3 INSTALLATION

- A. Install each hardware item in accordance with final approved Hardware Schedule and manufacturer's instructions.
 - 1. Set hardware level, plumb and true to line and location.
 - 2. Adjust and reinforce attachment substrate as required for proper installation and operation of hardware.
 - 3. Drill and countersink units which are not factory-prepared for anchorage fasteners; space fasteners and anchors uniformly, in accordance with industry standards.
- B. Hardware Mounting Heights:
 - 1. Provide heights as indicated on Drawings, except as otherwise required for compliance with governing regulations.
 - 2. Where heights are not indicated, comply with mounting requirements of DHI "Recommended Locations for Builder's Hardware" on custom steel doors and frames.
- C. Fire Doors and Exit Doors: Hardware for labeled fire doors shall be installed in accordance with the requirements of NFPA 80. Hardware for listed exit doors shall be installed in accordance with the requirements of NFPA 101.
- D. Hinges:
 - 1. Install steel doors and wood doors to comply with reference standards, as specified in door sections.
 - 2. Where shimming is required to comply with tolerances, provide metal shims only.
- E. Closers:
 - 1. Do not install parallel arm closers until after weather-stripping or seals have been installed on head frame (where weather-stripping or seals are scheduled).
 - 2. Do not cut weather-stripping or seals for attachment of closer brackets or shoes.
 - 3. Adjust closers to control door swing and to provide positive latching of doors.
 - a. Adjust closers not to exceed following manual opening forces:
 - 1) Exterior doors: As required to close and latch each leaf.
 - 2) Interior doors (non-fire-rated): Maximum 5-pound opening force.
 - 3) Fire-rated doors: As required to close and latch each leaf.
 - b. After air-handling system has been balanced, make final adjustment of all closers.
- F. Door Stops:
 - 1. Install stops for maximum degree of door opening swing allowed by conditions of installation.
 - 2. Locate floor stops so as not to create a tripping hazard.
 - 3. Locate wall stops centered on spindle of lever handles.
- G. Weather-stripping and Seals:
 - 1. Install continuous around door heads and jambs, and meeting stiles of pairs of doors.
 - 2. Install bottom weather-stripping and automatic door bottoms for full width of door.
 - 3. Do not cut weather-stripping or seals for attachment of closer brackets or shoes.
 - 4. Align rain drips with the bottom edge of the door frame rabbet, set in a bed of sealant, and attach with stainless steel fasteners.
 - 5. Set all exterior thresholds in full bed of mastic sealant.
- H. Fire Department Access Vault: Install in accordance with manufacturer's instructions in location as directed.
- I. Cylinder Cores: When notified by the Owner, remove construction cores and install permanent cores in the presence of the Owner's designated representative. Upon removal of temporary cores, verify that all locking components (e.g. collars, tailpieces, etc.) are still intact.

- 1. It is the Contractor's responsibility to return the construction cores and keys to the manufacturer. Construction cores and keys remain the property of the Cylinder Manufacturers.
- J. Key Cabinet: Install in accordance with manufacturer's instructions in location as directed. Instruct the Owner in the use of the key control system.

3.4 ADJUST AND CLEAN

- A. General: To insure proper operation and function of every unit, adjust and check each operating item of hardware and each door. Lubricate moving parts with type lubrication recommended by the manufacturer (graphite-type if no other recommended). Replace unit that cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.
 - 1. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Verify that the Owner has been supplied with manufacturers' installation and maintenance manuals, catalogs, and any special adjusting tools normally supplied by the manufacturer.
- B. Final Adjustment: Wherever hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and perform a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate as necessary to restore proper function and finish of hardware and doors.
 - Prior to acceptance of any electrical hardware system, an operational test shall be performed to determine if devices are functioning as intended by the specifications. Wiring shall be tested for correct voltage, current-carrying capacity, and proper grounding. Stray voltages in lock wiring shall be eliminated to prevent locking devices from releasing in critical situations.
- C. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
 - 1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
 - 2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
 - 3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.5 HARDWARE SET SCHEDULE

- A. Description of Work:
 - 1. The following set schedules are to be used with Drawings as guide for furnishing door hardware.
 - 2. Set numbers specified correspond to set numbers indicated on Drawings.
 - 3. Schedules do not reflect hand, backset (except as noted) or method of fastening of hardware items.

Set 110

1

Hinges BB1279

Latchset ML2010 x M17

1 Stop (GJ90S at Door #A104A)

Hager Corbin Russwin Rockwood

Set 111		
	Hinges BB1279	Hager
1	Latchset ML2010 x M17	Corbin Russwin
1	Kick plate 8400	Ives
1 set	Seals 107S – Head & Jambs	National Guard
1	Threshold 411	National Guard
1	Automatic door bottom 422N / 320S	National Guard
1	Stop	Rockwood
Set 112		
	Hinges BB1279 (1250 at center location)	Hager
1	Privacy latch ML2060 x M17 x M19VN x M34	Corbin Russwin
1	Kick plate 8400	Ives
1	Coat hook 571	Ives
1	Stop	Rockwood
Set 112	A	
	Hinges BB1191-32D (1150-32D at center location)	Hager
1	Privacy lock ML2065 x M17 x M19VN x M34	Corbin Russwin
1	Cylinder – as required	Medeco
1	Kick plate 8400	Ives
1	Coat hook 571	Ives
1	Overhead stop 90S x US32D	Glynn-Johnson
Set 113		
	Hinges BB1279	Hager
1	Privacy latch ML2060 x M17 x M19VN x M34	Corbin Russwin
1	Surface closer 4040XP / 4040XP-EDA	LCN
1	Kick plate 8400	Ives
1	Mop plate 8400 (inswing doors only)	Ives
1	Coat hook 571	Ives
1	Stop	Rockwood
Set 114		
	Hinges BB1279	Hager
1	Privacy latch ML2060 x M17 x M19VN x M34	Corbin Russwin
1	Kick plate 8400	Ives
1	Mop plate 8400	Ives
1	Stop	Rockwood
Set 115		
	Hinges BB1279	Hager
1	Latchset ML2010 x M17	Corbin Russwin
1	Kick plate 8400	Ives
1	Mop plate 8400	Ives
1	Stop	Rockwood
Set 116		
	Hinges BB1279	Hager
1	Latchset ML2010 x M17	Corbin Russwin
1	Kick plate 8400	Ives
1	Stop	Rockwood

Set 12	20	
	Hinges BB1279	Hager
2	Bottom surface bolts 630-8 x mortise strikes	Rockwood
2	Holder-stops 494S (install high on door leafs)	Rockwood
Set 21	2	
	Hinges BB1279	Hager
1	Push plate 8200	Ives
1	Pull plate 8302 (TB pull & conceal fasteners under push plate)	Ives
1	Surface closer 4040XP-H / 4040XP-H-EDA	LCN
1	Kick plate 8400	Ives
1	Stop	Rockwood
Set 21	3	
1	Continuous hinge 780-112HD	Hager
1	Deadlock DL4122 x M40 x 34" AFF	Corbin Russwin
2	Cylinders – as required	Medeco
1	Push plate 8200	Ives
1	Pull plate 8302 (TB pull & conceal fasteners under push plate)	Ives
1	Surface closer 4040XP-EDA	LCN
1	Kick plate 8400	Ives
1	Hold/stop 494S	Rockwood
Set 21	4	
1	Continuous hinge 780-112HD	Hager
1	Deadlock DL4122 x M40 x 34" AFF	Corbin Russwin
2	Cylinders – as required	Medeco
1	Push plate 8200	Ives
1	Pull plate 8302 (TB pull & conceal fasteners under push plate)	Ives
1	Surface closer 4040XP	LCN
1	Kick plate 8400	Ives
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 896S	National Guard
1	Sill sweep 200N – pull side	National Guard
1	Sill drip 101VA – push side	National Guard
1	Rain drip 16	National Guard
1	Magnetic door contact 1078C	GES
1	Hold/stop 494S	Rockwood
Set 21	5	
1	Continuous hinge 780-112HD	Hager
1	Deadlock DL4112 x M40 x 34" AFF	Corbin Russwin
2	Cylinders – as required	Medeco
1	Push plate 8200	Ives
1	Pull plate 8302 (TB pull & conceal fasteners under push plate)	Ives
1	Surface closer 4040XP-H	LCN
1	Kick plate 8400	Ives
1	Mop plate 8400	Ives
1	Stop	Rockwood

Set 220	0	
2	Continuous hinges 780-112HD	Hager
1	Deadlock DL4112 x M40 x 34" AFF	Corbin Russwin
2	Cylinders – as required	Medeco
1	Top flush bolt 555	Rockwood
2	Push plates 8200	Ives
2	Pull plates 8302 (TB pull & conceal fasteners under push plate)	Ives
2	Surface closers 4040XP-H-EDA	LCN
2	Kick plates 8400	Ives
2	Stops	Rockwood
Set 31	1	
	Hinges BB1279	Hager
1	Exit device 98L x 996L-NL	Von Duprin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP-SCNS	LCN
Set 314	4	
1	Continuous hinge 780-112HD	Hager
1	Exit device 98L x 996L-2	Von Duprin
2	Cylinders – as required	Medeco
1	Surface closer 4040XP-EDA	LCN
1	Kick plate 8400	Ives
1	Stop	Rockwood
Set 31:	5	
1	Continuous hinge 780-112HD	Hager
1	Exit device LD-9875L x 996L-NL (US32D strike)	Von Duprin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP-H-SCNS	LCN
1	Closer mounting bracket 328SPB (field-paint to match frame)	Zero
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 896S	National Guard
1	Sill sweep 200N	National Guard
1	Rain drin 16	National Guard
1	Magnetic door contact 1078C	GES
Set 318	8	
	Hinges BB1279	Hager
1	Exit device 98L x 996L-BE	Von Duprin
1	Surface closer 4040XP-SCNS	LCN
Set 320	0	
	Hinges BB1279	Hager
1	Exit device 98L x 996L-BE	Von Duprin
1	Exit device 98EO	Von Duprin
1	Removable mullion KR9954 x 154 (field-paint to match frame)	Von Duprin
1	Cylinder – as required	Medeco
2	Surface closer 4040XP-EDA	LCN
2	Kick plates 8400	Ives
2	Electromagnetic holders SEM 7850 x armature extenders as required	
	(provide one SEM 7820 & one SEM 7850 at Door #ST1B)	LCN

Function: Magnetic holders release upon activation of Fire Alarm; power source must be connected to Fire Alarm.

2	Continuous hinges 780-112HD	Hager
1	Exit device 9827L-LBR x 996L	Von Duprin
1	Exit device 9827EO-LBR	Von Duprin
1	Cylinder – as required	Medeco
2	Surface closer 4040XP-EDA	LCN
2	Kick plates 8400	Ives
2	Electromagnetic holders SEM 7850 x armature extenders as required	LCN
2	Magnetic door contacts 1078C	GES

Function: Magnetic holders release upon activation of Fire Alarm; power source must be connected to Fire Alarm.

Set 322		
	Hinges BB1279	Hager
1	Exit device 9847L-LBR x 996L-BE	Von Duprin
1	Exit device 9847EO-LBR	Von Duprin
2	Surface closer 4040XP-EDA	LCN
2	Kick plates 8400	Ives
2	Electromagnetic holders SEM 7850 x armature extenders as required	LCN
Functio	on: Magnetic holders release upon activation of Fire Alarm; power source	must be
connect	ted to Fire Alarm.	

Set 323

2002		
2	Continuous hinges 780-112HD	Hager
2	Exit devices 98L x 996L-BE	Von Duprin
1	Removable mullion KR4954 x 154 (field-paint to match frame)	Von Duprin
1	Cylinder – as required	Medeco
2	Surface closers 4040XP-H-EDA	LCN
2	Kick plates 8400	Ives
2	Stops	Rockwood
Set 32	4	
2	Continuous hinges 780-112HD	Hager
2	Exit devices 98L x 996L-2	Von Duprin
1	Removable mullion KR4954 x 154 (field-paint to match frame)	Von Duprin
5	Cylinders – as required	Medeco
2	Surface closers 4040XP-EDA	LCN
2	Kick plates 8400	Ives
2	Stops	Rockwood
Set 32	5	
2	Continuous hinges 780-112HD	Hager
1	Exit device CD-98NL x VR910NL	Von Duprin
1	Exit device CD-98EO x VR910DT	Von Duprin
1	Removable mullion KR4954 x 154 (field-paint to match frame)	Von Duprin
4	Cylinders – as required	Medeco
2	Surface closers 4040XP-H-EDA	LCN
2	Kick plates 8400	Ives
2	Stops	Rockwood

Set 326 Hinges BB1279 Hager Exit device 9847L-LBR x 996L Von Duprin 1 1 Exit device 9847EO-LBR Von Duprin 1 Cylinder – as required Medeco 2 Surface closer 4040XP-EDA LCN 2 Kick plates 8400 Ives 2 Electromagnetic holders SEM 7850 x armature extenders as required LCN Function: Magnetic holders release upon activation of Fire Alarm; power source must be connected to Fire Alarm. Set 327 2 Continuous hinges 780-112HD Hager Exit device CD-XP98NL x VR910NL 1 Von Duprin Von Duprin 1 Exit device LD-XP98EO Removable mullion KR4954 x 154 (field-paint to match frame) Von Duprin 1 3 Cylinders – as required Medeco 2 Surface closers 4040XP-SCNS LCN 2 Closer mounting brackets 328SPB (field-paint to match frame) Zero

2 Kick plates 8400 Ives 1 set Weather-stripping 110N - Head & Jambs National Guard Threshold 896S 1 National Guard Meeting stile gaskets 156S 1 set National Guard 2 Sill sweeps 200N National Guard Magnetic lock M490P (active leaf) Schlage Electronics 1 1 PIR/RTE motion sensor SCAN II **Schlage Electronics** 1 Exit button 631-AL-EX-DA Schlage Electronics 2 Magnetic door contacts 1078C GES

Function: Access Control System will shunt door contacts and release magnetic lock. Exit button and motion sensor will shunt door contacts and release magnetic lock. Magnetic lock is connected to Fire Alarm.

Set 328 2 Continuous hinges 780-112HD Hager Exit device 9827L-LBR x 996L-2 Von Duprin 1 4 Cylinders - as required Medeco 2 Surface closers 4040XP-H-EDA / 4040XP-H-SCNS LCN 2 Kick plates 8400 Ives Stop Rockwood 1 Set 329 Continuous hinges 780-112HD 2 Hager 2 Exit devices 98L x 996L-BE Von Duprin 1 Removable mullion KR4954 x 154 (field-paint to match frame) Von Duprin 1 Cylinder - as required Medeco 2 Surface closers 4040XP-EDA LCN 2 Kick plates 8400 Ives 2 Stops Rockwood

Set 430		
1	Continuous hinge 780-112HD	Hager
1	Exit device XP98L x 996L (provide weep holes in cross bar)	Von Duprin
1	Cylinder - as required	Medeco
1	Surface closer 4040XP-H	LCN
1 set	Weather-stripping – Head & Jambs	Door Manufacturer
1	Threshold 896S	National Guard
1	Sill sweep 200N (grey neoprene insert) – pull side	National Guard
1	Sill drip 101VA – push side	National Guard
1	Rain drip 16	National Guard
1	Magnetic door contact 1078C	GES
1	Stop	Rockwood
	Free egress from roof	
Set 431		
1	Continuous hinge 780-112HD	Hager
1	Exit device CD-XP98NL x VR910NL	Von Duprin
2	Cylinders – as required	Medeco
1	Surface closer 4040XP-SCNS	LCN
1 set	Weather-stripping – Head & Jambs	Door Manufacturer
1	Threshold 896S	National Guard
1	Sill sweep 200N (grey neoprene insert)	National Guard
1	Magnetic door contact 1078C	GES
Set 440		
2	Continuous hinges 780-112HD	Hager
2	Exit devices CD-XP98EO x VR910DT	Von Duprin
1	Removable mullion KR4954-154 (field-paint to match storefront)	Von Duprin
3	Cylinders – as required	Medeco
2	Surface closers 4040XP-H-SCNS	LCN
1 set	Weather-stripping – Head, Jambs & Meeting Stile	Door Manufacturer
1	Threshold 896S	National Guard
2	Sill sweeps 200N (grey neoprene insert)	National Guard
2	Magnetic door contacts 1078C	GES
Set 441		
2	Continuous hinges 780-112HD	Hager
2	Exit devices CD-XP98EO x VR910DT	Von Duprin
1	Removable mullion KR4954-154 (field-paint to match storefront)	Von Duprin
3	Cylinders – as required	Medeco
2	Surface closers 4040XP-SCNS	LCN
1 set	Weather-stripping – Head, Jambs & Meeting Stile	Door Manufacturer
1	Threshold 896S	National Guard
2	Sill sweeps 200N (grey neoprene insert)	National Guard
1	PIR/RTE motion sensor SCAN II	Schlage Electronics
2	Magnetic door contacts 1078C	GES

Set 442		
2	Continuous hinges 780-112HD	Hager
1	Exit device CD-XP98NL x VR910NL	Von Duprin
1	Exit device CD-XP98EO x VR910DT	Von Duprin
1	Removable mullion KR4954-154 (field-paint to match storefront)	Von Duprin
4	Cylinders – as required	Medeco
1	Low energy operator 9542 (RHR Leaf)	LCN
1	Wireless wall-mounted actuator 8310-3856TWF (pull-side)	LCN
1	Hardwired jamb-mounted actuator 8310-818T (push-side)	LCN
1	RF receiver 8310-865	LCN
1	Surface closer 4040XP-SCNS	LCN
1 set	Weather-stripping – Head, Jambs & Meeting Stile	Door Manufacturer
1	Threshold 896S	National Guard
2	Sill sweeps 200N (grey neoprene insert)	National Guard
1	Magnetic lock M490P (RHR leaf)	Schlage Electronics
1	PIR/RTE motion sensor SCAN II	Schlage Electronics
1	Exit button 631-AL-EX-DA-NS	Schlage Electronics
2	Magnetic door contacts 1078C	GES
1	Stop 466 (power-assist leaf)	Rockwood

Function: Access Control System will shunt door contacts and release magnetic lock. Exit button and motion sensor will shunt door contacts and release magnetic lock. Magnetic lock is connected to Fire Alarm. Outside actuator should not function when door is secured. Install push-side actuator in hinge jamb adjacent to operator; install pull-side actuator in wall adjacent to card reader (must be clear of the door swing).

Set 443

2	Continuous hinges 780-112HD	Hager
1	Exit device CD-XP98NL x VR910NL	Von Duprin
1	Exit device CD-XP98EO x VR910DT	Von Duprin
1	Removable mullion KR4954-154 (field-paint to match storefront)	Von Duprin
4	Cylinders – as required	Medeco
2	Surface closer 4040XP-SCNS	LCN
1 set	Weather-stripping – Head, Jambs & Meeting Stile	Door Manufacturer
1	Threshold 896S	National Guard
2	Sill sweeps 200N (grey neoprene insert)	National Guard
1	Magnetic lock M490P	Schlage Electronics
1	PIR/RTE motion sensor SCAN II	Schlage Electronics
1	Exit button 631-AL-EX-DA-NS	Schlage Electronics
2	Magnetic door contacts 1078C	GES

Function: Access Control System will shunt door contacts and release magnetic lock. Exit button and motion sensor will shunt door contacts and release magnetic lock. Magnetic lock is connected to Fire Alarm.

Set 444		
2	Continuous hinges 780-112HD	Hager
2	Exit devices LD-XP98EO	Von Duprin
1	Removable mullion KR4954 x 154 (field-paint to match storefront)	Von Duprin
1	Cylinder – as required	Medeco
2	Surface closers 4040XP-SCNS	LCN
1 set	Weather-stripping – Head, Jambs & Meeting Stile	Door Manufacturer
1	Threshold 896S	National Guard
2	Sill sweeps 200N (grey neoprene insert)	National Guard
2	Magnetic door contacts 1078C	GES
Set 510		
	Hinges BB1279	Hager
1	Lockset ML2051 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Stop	Rockwood
Set 511	I	
500 511	Hinges BB1279	Hager
1	Lockset ML2051 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Kick plate 8400	Ives
1	Mon plate 8400	Ives
1	Stop	Rockwood
Fot 512		noonwood
Set 512	Hinges BB1270	Hagar
1	Lockset MI 2051 x M17	Corbin Pusswin
1	Cylinder as required	Coroni Russwin Medeco
1	Surface closer 4040VD / 4040VD EDA	I CN
1	Kick plate \$400	LUN
1	Stop	Rockwood
1	Stop	KOCKWOOd
Set 513	U. DD1070	TT
1	Hinges BB12/9	Hager
1	Lockset ML2051 x M1/ x LHR	Corbin Russwin
1	Cylinder – as required	Medeco
1	Kick plate 8400	Ives
1	Mop plate 8400	IVes
I	Overnead stop 908	Glynn-Jonnson
Set 514		
	Hinges BB1279	Hager
1	Lockset ML2051 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP-H / 4040XP-H-EDA	LCN
1	Kick plate 8400	lves
1	Stop	Rockwood

Set 615	5	
1	Continuous hinge 780-112HD	Hager
1	Lockset ML2055 x M17 (LHR outswing)	Corbin Russwin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP-EDA	LCN
1	Armor plate 8400	Ives
1	Door viewer 627	Rockwood
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 269A / 3674A / 269A / 3675A / 68A	Zero
1	Door bottom 4440SA	National Guard
1	Magnetic lock M490P (active leaf)	Schlage Electronics
1	PIR/RTE motion sensor SCAN II	Schlage Electronics
1	Exit button 631-AL-EX-DA	Schlage Electronics
1	Magnetic door contact 1078C	GES
1	Hold/stop 494S	Rockwood
	Include the following:	
1	Screen door 400SE (LH inswing)	Cline Doors
3	Hinges BB1191-32D	Hager
1	Lockset CL3372-NZD x M17	Corbin Russwin
2	Cylinder cores – as required	Medeco
1	Surface closer 4040XP-H x SNB fasteners	LCN
1	Kick plate 8400 – 8" x 2" LDW	Ives
1	Sill sweep 200N	National Guard
1	Stop	Rockwood
Function	on: Access Control System will shunt door contact and release	se magnetic lock. Exit
button	and motion sensor will shunt door contact and release magne	tic lock. Magnetic lock is

button and motion sensor will shunt connected to Fire Alarm.

Set	622
DUL	022

2	Continuous hinges 780-112HD	Hager
1	Lockset ML2042 x M17	Corbin Russwin
2	Cylinders – as required	Medeco
2	Flush bolts 555	Rockwood
1	Dust strike 570	Rockwood
2	Surface closers 4040XP-H-SCNS	LCN
2	Closer mounting brackets 328SPB (field-paint to match frame)	Zero
2	Armor plates 8400	Ives
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 896S	National Guard
1	Meeting stile gasket 109N	National Guard
2	Sill sweeps 200N	National Guard
1	Rain drip 16	National Guard
2	Magnetic door contacts 1078C	GES
Set 710		
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1	Lockset ML2055 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Stop	Rockwood

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	1	Stop	Rockwood

Set 717	7	
1	Continuous hinge 780-112HD	Hager
1	Lockset ML2055 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP-H	LCN
1	Kick plate 8400	Ives
1	Stop	Rockwood
Set 720	0	
	Hinges BB1279	Hager
1	Lockset ML2055 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
2	Flush bolts 555	Rockwood
1	Dust strike 570	Rockwood
2	Armor plates 8400	Ives
2	Stops	Rockwood
	Astragal by door manufacturer	
Set 722	2	
2	Continuous hinges 780-112HD	Hager
1	Lockset ML2055 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
2	Flush bolts 555	Rockwood
1	Dust strike 570	Rockwood
1	Surface closer 4040XP / 4040XP-EDA	LCN
2	Armor plates 8400	Ives
2	Stops	Rockwood
	Astragal by door manufacturer	
Set 810	0	
	Hinges BB1279	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Stop	Rockwood
Set 81	1	
	Hinges BB1279	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP / 4040XP-EDA	LCN
1	Stop	Rockwood
Set 812	2	
	Hinges BB1279	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP / 4040XP-EDA	LCN
1	Kick plate 8400	Ives
1	Stop	Rockwood
Set 813	3	
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	Hinges BB1279	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Kick plate 8400	Ives
1 set	Seals 107S – Head & Jambs	National Guard
1	Threshold 411	National Guard
1	Automatic door bottom 422N / 320S	National Guard
1	Holder-stop 494S	Rockwood
Set 814	4	
1	Continuous hinge 780-112HD	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP-H-EDA	LCN
1	Closer mounting bracket 870SPB (field-paint to match frame)	Zero
1	Kick plate 8400	Ives
1 set	Seals 107SA – Head & Jambs	National Guard
1	Threshold 411	National Guard
1	Automatic door bottom 422N / 320S	National Guard
1	Stop	Rockwood
Set 815	5	
	Hinges BB1279	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Kick plate 8400	Ives
1	Holder-stop 494S	Rockwood
Set 816	5	
	Hinges BB1279	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Surface closer 4040XP / 4040XP-EDA	LCN
1	Closer mounting bracket 870SPB (field-paint to match frame)	Zero
1 set	Seals 107S – Head & Jambs	National Guard
1	Threshold 411	National Guard
1	Automatic door bottom 422N / 320S	National Guard
1	Stop	Rockwood
	Closer mounting bracket only required at 'push-side mounted' closers	

Set 818		
1	Continuous hinge 780-112HD	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Kick plate 8400	Ives
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 896S	National Guard
1	Sill sweep 200N	National Guard
1	Rain drip 16	National Guard
1	Magnetic door contact 1078C	GES
1	Overhead stop 90H	Glynn-Johnson
1	Overhead stop mounting bracket 328SPB (field-paint to match frame)	Zero
Set 819		
1	Continuous hinge 780-112HD	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
1	Armor plate 8400	Ives
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 896S	National Guard
1	Sill sweep 200N	National Guard
1	Rain drip 16	National Guard
1	Magnetic door contact 1078C	GES
1	Overhead stop 90H	Glynn-Johnson
1	Overhead stop mounting bracket 328SPB (field-paint to match frame)	Zero
Set 822		
2	Continuous hinges 780-112HD	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
2	Flush bolts 555	Rockwood
1	Dust strike 570	Rockwood
2	Surface closers 4040XP-H-SCNS	LCN
2	Closer mounting brackets 328SPB (field-paint to match frame)	Zero
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 896S	National Guard
1	Meeting stile gasket 109N	National Guard
2	Sill sweeps 200N	National Guard
1	Rain drip 16	National Guard
2	Magnetic door contacts 1078C	GES

Set 823		
2	Continuous hinges 780-112HD	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
2	Flush bolts 555	Rockwood
1	Dust strike 570	Rockwood
2	Armor plates 8400	Ives
1 set	Weather-stripping 110N - Head & Jambs	National Guard
1	Threshold 896S	National Guard
1	Meeting stile gasket 109N	National Guard
2	Sill sweeps 200N	National Guard
1	Rain drip 16	National Guard
2	Magnetic door contacts 1078C	GES
2	Overhead stops 90H	Glynn-Johnson
2	Overhead stop mounting brackets 328SPB (field-paint to match frame)) Zero
Set 826		
	Hinges BB1279	Hager
1	Lockset ML2057 x M17	Corbin Russwin
1	Cylinder – as required	Medeco
2	Flush bolts 555	Rockwood
1	Dust strike 570	Rockwood
1	Surface closer 4040XP	LCN
1 set	Seals 107S – Head & Jambs	National Guard
1	Meeting stile gasket 109N (install on push-side of inactive leaf)	National Guard
1	Threshold 411	National Guard
2	Automatic door bottom 422N / 320S	National Guard
2	Stop	Rockwood
	Astragal by door manufacturer	

SECTION 08 80 00 - GLAZING

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Glass.
 - B. Glazing compounds and accessories.
- 1.2 REFERENCE STANDARDS
 - A. 16 CFR 1201 Safety Standard for Architectural Glazing Materials; current edition.
 - B. ASTM C864 Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
 - C. ASTM C920 Standard Specification for Elastomeric Joint Sealants; 2011.
 - D. ASTM C1036 Standard Specification for Flat Glass; 2011e1.
 - E. ASTM C1048 Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2012.
 - F. ASTM C1193 Standard Guide for Use of Joint Sealants; 2011a.
 - G. ASTM E1300 Standard Practice for Determining Load Resistance of Glass in Buildings; 2009a.
 - H. ASTM E2190 Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.
 - I. GANA (GM) GANA Glazing Manual; Glass Association of North America; 2009.
 - J. GANA (SM) FGMA Sealant Manual; Glass Association of North America; 2008.
- 1.3 SUBMITTALS
 - A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
 - B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
 - C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
 - D. Samples: Submit two samples 12 x 12 inch in size of glass units.
 - E. Certificates: Certify that products meet or exceed specified requirements.
 - F. LEED Report: Report VOC content of sealants.
 - 1. Comply with VOC content limits of Section 01616.
 - G. LEED Submittal: Product data indicating visible light transmittance of insulating glass units (Credit EQ 8.1).

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.

1.5 MOCK-UP

A. Locate within framing set in masonry mock-up.

1.6 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

1.7 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
- C. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.1 EXTERIOR GLAZING ASSEMBLIES

- A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with (IBC) Inernational Building code.
 - 1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
 - 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
 - 3. Thicknesses listed are minimum.

2.2 GLASS MATERIALS

- A. Float Glass Manufacturers:
 - 1. AGC Flat Glass North America: www.afgglass.com.
 - 2. Oldcastle Glass.
 - 3. Pilkington North America Inc: www.pilkington.com/na.
 - 4. PPG Industries, Inc: www.ppgideascapes.com.
- B. Float Glass: All glazing is to be float glass unless otherwise indicated.
 - 1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
 - 2. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
 - 3. Tinted Types: Color and performance characteristics as indicated.
 - 4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
- C. Laminated Glass (For use in Type G-3): Float glass laminated in accordance with ASTM C1172.
 - 1. Thickness: 5/16 inch.
 - 2. Translucent interlayer; one layer 0.030 translucent polyvinyl butyral with a proven record of no tendancy to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation equivalent to "Artic Snow 216500" by Solutia, Inc.
- D. Clear Float Glass : Clear, annealed.

- 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
- 2. 6 mm minimum thick.
- E. Safety Glass (Type G-5): Clear; fully tempered with horizontal tempering.
 - 1. Comply with 16 CFR 1201 test requirements for Category II.
 - 2. 6 mm minimum thick.
 - 3. Provide this type of glazing in the locations indicated on the drawings.

2.3 SEALED INSULATING GLASS UNITS

- A. Manufacturers:
 - 1. Any of the manufacturers specified for float glass.
 - 2. Cardinal Glass Industries: www.cardinalcorp.com.
 - 3. Guardian Industries Corp: www.guardian.com.
 - 4. Viracon, Apogee Enterprises, Inc: www.viracon.com.
- B. Sealed Insulating Glass Units: Types as indicated.
 - 1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 - 2. Edge Spacers: Aluminum, bent and soldered corners.
 - 3. Edge Seal: Glass to elastomer with supplementary silicone sealant.
 - 4. Purge interpane space with dry hermetic air.
- C. Insulated Glass Units (Type G-1): Double pane with glass to elastomer edge seal.
 - 1. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
 - 2. Purge interpane space with dry hermetic air.
 - 3. Total unit thickness of 1 inch.
 - 4. Basis-of-Design Clear Insulating Units: Guardian SuperNeutral 54 or equal or better product of other named manufacturers.
 - a. Overall Unit Thickness and Thickness of Each Lite: 25 and 6.0 mm.
 - b. Interspace Content: Air.
 - c. Outdoor Lite: Class 1 (clear) float glass; Kind FT (fully tempered).
 - d. Indoor Lite: Class 1 (clear) float glass; Kind FT (fully tempered).
 - e. Low-E Coating: Second or third surface.
 - f. Visible Light Transmittance: 54 percent minimum.
 - g. Winter Nighttime U-Factor: 0.28 or better.
 - h. Summer Daytime U-Factor: 0.27 or better.
 - i. Solar Heat Gain Coefficient: 0.28 maximum.
 - j. Outdoor Visible Reflectance: 13 percent maximum.
- D. Insulating Glass Units (Type G-2): Same as G-1 except provide indoor lite to be ceramic-coated (fourth surface) spandrel glass, ASTM C 1048, Condition B (spandrel glass, one surface ceramic coated), Type I (transparent flat glass), Quality-Q3, and complying with other requirements specified.
 - 1. Outdoor lite remains Basis-of-Design product with same low-E coating on second surface.
 - 2. Fallout Resistance: Provide spandrel units identical to those passing the fallout-resistance test for spandrel glass specified in ASTM C 1048.
- E. Insulated Glass Units (Type G-3): Double pane with glass to elastomer edge seal.
 - 1. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
 - 2. Purge interpane space with dry hermetic air.
 - 3. Total unit thickness of 1 inch .

- 4. Basis-of-Design Clear Insulating Units: Guardian SuperNeutral 54 or equal or better product of other named manufacturers.
 - a. Overall Unit Thickness and Thickness of Each Lite: 25 and 6.0 mm.
 - b. Interspace Content: Air.
 - c. Outdoor Lite: Class 1 (clear) float glass; Kind FT (fully tempered).
 - d. Indoor Lite: Class 1 (clear) laminated glass (with translucent interlayer); Kind FT (fully tempered).
 - e. Low-E Coating: Second or third surface.
 - f. Visible Light Transmittance: 54 percent minimum.
 - g. Winter Nighttime U-Factor: 0.28 or better.
 - h. Summer Daytime U-Factor: 0.27 or better.
 - i. Solar Heat Gain Coefficient: 0.28 maximum.
 - j. Outdoor Visible Reflectance: 13 percent maximum.
- F. Sealing System: Dual seal, with primary and secondary sealants as follows:
 - 1. Primary seal shall be extruded polyisobutylene continuously bonded to glass surfaces and desiccant filled metal spacer, including corners.
 - 2. Minimum width of primary seal shall be 0.125 inch (3.2 mm). Secondary seal shall be General Electric IGS 3723 or Dow Corning 982.
 - 3. Secondary seal shall completely cover spacer with no gaps or voids, and shall be continuously bonded to both plates of glass.
 - 4. Where insulating glass is supported by structural silicone, secondary seal shall be designed to transfer specified pressures from outdoor glass to indoor glass.
- G. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
 - 1. Spacer Material: Stainless steel or thermally jacketed stainless steel.
 - 2. Desiccant: Molecular sieve or silica gel, or blend of both.
 - 3. Corner Construction: Manufacturer's standard corner construction.

2.4 FIRE-RATED GLAZING PRODUCTS (Type G-6)

- A. Laminated Ceramic Glazing Material: Proprietary Category II safety glazing product in the form of 2 lites of clear ceramic glazing material laminated together to produce a laminated lite of 5/16-inch nominal thickness; polished on both surfaces; weighing 4 lb/sq. ft.; and as follows:
 - 1. Fire-Protection Rating: As indicated for the assembly in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Polished on both surfaces, transparent.
 - 3. Product: "FireLite Plus" by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.
- B. Laminated Glass with Intumescent Interlayers:
 - 1. At the Contractor's discretion, transparent wall product may be used instead of ceramic product; transparent wall panel products shall meet performance requirements specified for ceramic product.
 - 2. Contractor must verify proper glazing stop width and heights for ratings, with the door and frame manufacturers.
 - 3. Proprietary Category II safety glazing product in the form of multiple lites of Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Kind FT (fully tempered) float glass laminated with intumescent interlayers; and as follows:

- 4. Fire-Protection Rating: As indicated for the assembly in which glazing material is installed, and permanently labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
- 5. Product: Subject to compliance with requirements, "PyroStop" by Pilkington Building Products North America and distributed by Technical Glass Products.

2.5 GLAZING COMPOUNDS

- A. Butyl Sealant : Single component; Shore A hardness of 10 to 20; black color; non-skinning.
- B. Silicone Sealant : Single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected.
- C. Sealants applied within the building waterproofing envelope: Comply with low-emitting requirements specified in Section 01 61 16.

2.6 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products as follows:
 - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- D. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
 - 1. Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.
- E. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I; black color.
- F. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that openings for glazing are correctly sized and within tolerance.
 - B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Prime surfaces scheduled to receive sealant.
- C. Install sealants in accordance with ASTM C1193 and FGMA Sealant Manual.
- D. Install sealant in accordance with manufacturer's instructions.
- 3.3 INSTALLATION EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)
 - A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
 - B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
 - C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.
- 3.4 INSTALLATION EXTERIOR DRY METHOD (TAPE AND GASKET SPLINE GLAZING)
 - A. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
 - B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
 - C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
 - D. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
 - E. Trim protruding tape edge.
- 3.5 INSTALLATION INTERIOR DRY METHOD (TAPE AND TAPE)
 - A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
 - B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
 - C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
 - D. Place glazing tape on free perimeter of glazing in same manner described above.
 - E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
 - F. Knife trim protruding tape.

3.6 MANUFACTURER'S FIELD SERVICES

- A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- B. Monitor and report installation procedures and unacceptable conditions.

3.7 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

3.8 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

SECTION 08 83 00 - MIRRORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass mirrors.
- 1.2 REFERENCE STANDARDS
 - A. ASTM C1036 Standard Specification for Flat Glass; 2011e1.
 - B. ASTM C1503 Standard Specification for Silvered Flat Glass Mirror; 2008.
 - C. GANA (GM) GANA Glazing Manual; Glass Association of North America; 2009.
 - D. GANA (TIPS) Mirrors Handle with Extreme Care: Tips For the Professional on the Care and Handling of Mirrors; National Association of Mirror Manufacturers; 2004 (http://www.mirrorlink.org/members/technical.h

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data on Mirror Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. LEED Submittals: Provide product data for field-applied mastics indicating VOC content in g/L; comply with limits of Section 01616.
- D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- 1.4 QUALITY ASSURANCE
 - A. Perform Work in accordance with GANA Glazing Manual for glazing installation methods.
 - B. Fabricate, store, transport, receive, install, and clean mirrors in accordance with recommendations of GANA (TIPS) "Mirrors Handle with Extreme Care: Tips For the Professional on the Care and Handling of Mirrors."

1.5 FIELD CONDITIONS

- A. Do not install mirrors when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.
- 1.6 WARRANTY
 - A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
 - B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

- 2.1 MATERIALS
 - A. Mirror Glass General: Select materials and/or provide supports as required to limit mirrored glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

- B. Mirror Glass : ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality Q1 (mirror select); silvering, protective coating and physical characteristics complying with ASTM C1503; 6 mm minimum thick.
 - 1. Sizes noted on Drawings.

2.2 GLAZING ACCESSORIES

- A. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.
- B. Mirror Adhesive: Chemically compatible with mirror coating and wall substrate.
 - 1. Product produced specifically for setting mirrors.
 - 2. Product certified by mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors are installed.
 - 3. Adhesives and mastics applied within the building waterproofing envelope: Comply with low-emitting requirements specified in Section 01616.
 - 4. Manufacturers:
 - a. Gunther Mirror Mastics.
 - b. Palmer Products Corporation.
 - c. Bohle.
- C. Top and Bottom Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.
 - 1. Bottom Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch in height, respectively, and a thickness of not less than 0.05 inch.
 - 2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch in height, respectively, and a thickness of not less than 0.062 inch.
 - 3. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bottom Trim:
 - 1) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Shallow Nose "J" Moulding Lower Bar.
 - 2) C.R. Laurence Co.
 - 3) Stylmark; J-Molding Lower Bar.
 - b. Top Trim:
 - 1) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Deep Nose "J" Moulding Lower Bar.
 - 2) C.R. Laurence Co.
 - 3) Stylmark; J-Molding Lower Bar.
- D. Fasteners: Fabricated of compatible metal to fastened metal.

2.3 FABRICATION

- A. Mirror Sizes: To suit Project conditions, cut mirrors to final sizes and shapes.
- B. Cutouts: Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- C. Mirror Edge Treatment: Flat polished edge.
 - 1. Seal edges of mirrors after edge treatment to prevent chemical or atmospheric penetration of glass coating.
- D. Film-Backed Safety Mirrors:

- 1. Apply film backing with pressure-sensitive adhesive coating over mirror backing paint as recommended in writing by film-backing manufacturer to produce a surface free of bubbles, blisters, and other imperfections.
- 2. Use adhesives and film backing compatible with mirror backing paint as certified by mirror manufacturer.
- 3. Provide film backing on all glass mirrors.

PART 3 EXECUTION

- 3.1 PREPARATION
 - A. Clean contact surfaces with solvent and wipe dry.
- 3.2 INSTALLATION GENERAL
 - A. Install mirrors in accordance with GANA recommendations.
 - B. Set mirrors plumb and level, free of optical distortion.
 - C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.
 - D. Do not permit edges of mirrors to be exposed to standing water.
 - E. Wall-Mounted Mirrors:
 - 1. Install mirrors with mastic and mirror channels.
 - 2. Install mirror hardware in the form of J-channels that are fabricated in single lengths to fit and cover top and bottom edges of mirrors.
 - 3. Install mastic as follows:
 - a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
 - b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
 - c. After mastic is applied, align mirrors and press into place while maintaining a minimum air space of 1/8 inch between back of mirrors and mounting surface.

3.3 CLEANING

- A. Remove labels after work is complete.
- B. Clean mirrors and adjacent surfaces.

3.4 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

SECTION 08 91 00 - LOUVERS

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Louvers, frames, and accessories.
- 1.2 RELATED REQUIREMENTS
 - A. Section 07 90 05 Joint Sealers.

1.3 REFERENCE STANDARDS

- A. AAMA 2604 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. AMCA 500-L Laboratory Methods of Testing Louvers for Rating; Air Movement and Control Association International, Inc.; 2007.
- C. AMCA 511 Certified Ratings Program for Air Control Devices; Air Movement and Control Association International, Inc.; 2010.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- C. LEED Submittal: For sealants applied within the building waterproofing envelope, documentation including printed statement of VOC content in g/L.
- D. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- E. Samples: Submit two samples 2 by 2 inches in size illustrating finish and color of exterior surfaces.
- F. Test Reports: Independent agency reports showing compliance with specified performance criteria.
- G. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

1.6 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Provide twenty year manufacturer warranty against distortion, metal degradation, and failure of connections.
 - 1. Finish: Include coverage against degradation of exterior finish.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Airolite Company, LLC: www.airolite.com.

- B. Construction Specialties, Inc; Product RS-7315 (basis-of-design): www.c-sgroup.com.
- C. Industrial Louvers, Inc.
- D. Ruskin Company.
- 2.2 LOUVERS
 - A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified under AMCA 511.
 - 1. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
 - 2. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
 - 3. Screens: Provide bird screens.
 - B. Deep Storm Resistant Fixed Horizontal Louver:
 - 1. Material: Heads, sills, jambs and mullions to be one-piece structural aluminum members with integral caulking slot and retaining beads.
 - 2. Design: Architectural line drainable sightproof storm resistant fixed-blade; designed to collect and drain water to exterior at sill by means of multiple gutters in blades and channels in jambs and mullions.
 - 3. Louvers to be supplied with 4 inches high by full depth sill flashings formed from minimum 0.050 inch thick aluminum; sill flashings to have welded side panels.
 - 4. Frame: 7 inches deep, channel profile; corner joints mitered and welded.
 - 5. AMCA Performance: (48 inches wide by 48 inches high test unit)
 - a. Free Area: Minimum 8.0 sq. ft.
 - b. Intake pressure drop at 900 fpm free area velocity: Minimum 0.32 in. H2O.
 - c. Exhaust pressure drop at 900 fpm free area velocity: Minimum 0.44 in. H2O.
 - 6. Wind Driven Rain Performance:
 - a. The louver test based on a 1.00m by 1.00m core area; unit tested at a rainfall rate of 3.0 inches per hour and with a wind directed to the face of the louver at a velocity 29.1-mph.
 - b. The test data to show the water penetration effectiveness rating at each corresponding ventilation rate.

2.3 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), .
- B. Polyvinylidene Fluoride Coating: Minimum 70 percent Kynar 500/Hylar 500 resin, two coat finish, complying with AAMA 2604.
 - 1. Color: Custom, to match approved sample.

2.4 ACCESSORIES

- A. Blank-Off Panels: Same material as louver, painted black on exterior side.
 - 1. Provide where indicated and where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.
 - 2. Uninsulated Panels: Provide at unconditioned spaces; minimum 0.050 inch thick aluminum sheet.
 - 3. Insulated Panels: Provide at conditioned spaces or where indicated.
 - a. 1 inch thick and faced on both sides with minimum 0.032 inch thick aluminum sheet.

- b. Fabricated with an expanded polystyrene (EPS) core.
- c. Panel perimeter frame to be 0.050 inch thick-formed aluminum channels; panel frame mitered at the corners.
- 4. Finish: Same quality as louvers.
- B. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
 - 1. Bird screens to be minimum 5/8 inch mesh, 0.050 inch thick expanded and flattened aluminum bird screen secured within minimum 0.055 inch thick extruded aluminum frames; frames to have mitered corners and corner locks.
- C. Glazing Adapter: Provide where louvers are glazed into storefront or curtainwall frames; minimum 0.090 inch thick extruded aluminum.
- D. Fasteners and Anchors: Stainless steel.
- E. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.
- F. Sealant: ES-1 or ES-4 type, as specified in Section 07 90 05.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings.
- B. Verify that field measurements are as indicated.

3.2 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- D. Secure louver frames in openings with concealed fasteners.
- E. Install perimeter sealant and backing rod in accordance with Section 07 90 05.

3.3 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Shaft wall system.
- C. Fire rated area separation walls.
- D. Acoustic insulation.
- E. Gypsum sheathing.
- F. Gypsum wallboard.
- G. Glass mat faced gypsum board.
- H. Moisture and mold resistant wallboard.
- I. Joint treatment and accessories.

1.2 REFERENCE STANDARDS

- A. ASTM C475/C475M Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002 (Reapproved 2007).
- B. ASTM C665 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- C. ASTM C840 Standard Specification for Application and Finishing of Gypsum Board; 2011.
- D. ASTM C1047 Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2010a.
- E. ASTM C1280 Standard Specification for Application of Gypsum Sheathing; 2012.
- F. ASTM C1396/C1396M Standard Specification for Gypsum Board; 2011.
- G. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- H. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- I. ASTM E413 Classification for Rating Sound Insulation; 2010.
- J. GA-216 Application and Finishing of Gypsum Board; Gypsum Association; 2010.
- K. GA-226 Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
- C. Product Data: Provide data on gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.
- D. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.

- E. LEED Submittals: Provide documentation of VOC content in g/L for adhesives and acoustical sealants applied within the building waterproofing envelope; comply with VOC limits of Section 01616.
- F. Submit drawings indicating proposed location of control joints for Architect's review; locations to be approved by Architect and may be adjusted for aesthetic reasons.
- 1.4 QUALITY ASSURANCE
 - A. Maintain one copy of all installation standards at project site.
 - B. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
 - 1. Maintain one copy of standards at project site.

PART 2 PRODUCTS

- 2.1 GYPSUM BOARD ASSEMBLIES
 - A. Provide completed assemblies complying with ASTM C840 and GA-216.
 - B. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
 - 1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
 - 2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
 - C. Fire Rated Assemblies: Provide completed assemblies identical to those tested in assembly indicated.
 - D. Regional Content: Provide gypsum board manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.

2.2 BOARD MATERIALS

- A. Manufacturers Gypsum-Based Board:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. Georgia-Pacific Gypsum LLC: www.gp.com/gypsum.
 - 3. Lafarge North America: www.lafarge.com.
 - 4. National Gypsum Company: www.nationalgypsum.com.
 - 5. USG Corporation: www.usg.com.
- B. Recycled Content: Provide regular type gypsum panel products with minimum 80 percent recycled content, including recycled content face paper; provide Type X with minimum 10 percent recycled content.
- C. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Regular Type:
 - a. Application: Use for vertical surfaces, unless otherwise indicated.
 - b. Edges: Tapered.
 - 2. Fire Resistant Type: Complying with Type X requirements; UL or WH rated.
 - a. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
 - b. Edges: Tapered.
 - 3. Ceiling Board: Special sag-resistant type.

- a. Application: Ceilings, except areas with showers or otherwise indicated.
- b. Thickness: 1/2 inch.
- c. Edges: Tapered.
- D. Abuse-Resistant Gypsum Board: ASTM C36; gypsum wall board with additives to enhance impact resistance of the core and indentation resistance to the surface, and surfaced with abrasion resistant paper on front and long edges with heavy liner paper bonded to back side.
 - 1. Location: Where Drawings indicate abuse-resistant gypsum wallboard.
 - 2. Type: Type X where required for fire-resistance-rated assemblies.
 - 3. Thickness: 5/8-inch.
 - 4. Edges: Tapered.
 - 5. Performance Properties:
 - a. Surface Abrasion: 0.284-inch, when tested according to ASTM D 4977 with 25 lb added weight, 50 abrasion cycles.
 - b. Surface Indentation: Less than 0.200-inch, when tested according to ASTM D 5420 with 72 inch-lb drop energy.
 - c. Soft Body Impact: When tested according to ASTM E 695:
 - 1) Surface Failure: 150 ft-lb.
 - 2) Structural Failure: 210 ft-lb.
 - d. Hard Body Impact: When tested according to swinging ram apparatus, 85 ft-lb.
 - 6. Acceptable Product:
 - a. Mold Tough VHI Firecode; United States Gypsum Company.
 - b. Hi-Impact XP by National Gypsum.
 - c. Air Renew Extreme Impact Resistant Gyupsum Board by Certainteed.
- E. Moisture and Mold Resistant Wallboard: Wallboard installed at building perimeter, and any wallboard furred to concrete or masonry construction.
 - 1. Characteristics:
 - a. ASTM C 1396 (Section 5) regular type except where Type X fire-resistant type is indicated or required by to meet UL assembly types.
 - b. Edges: Tapered.
 - c. Resists the growth of mold when tested, as manufactured, according to ASTM D 3273.
 - 2. Available Products:
 - a. SHEETROCK® Brand Mold Tough® Gypsum Panels by USG.
 - b. Gold Bond® BRAND XP® Wallboard by National Gypsum.
 - c. Mold Defense Products by LaFarge.

2.3 FIBERGLASS REINFORCED BOARD MATERIALS

- A. Glass Mat Gypsum Board: Gypsum panels with moisture-resistant core and coated inorganic fiberglass mat back surface designed to resist growth of mold and mildew, per ASTM D 3273.
 - 1. Glass Mat Board: Comply with performance requirements of ASTM C 1396/C 1396M for water-resistant gypsum backing board and ASTM C 1177/C 1177M for sheathing; tapered long edges.
 - 2. Application: High-humidity or wet locations; walls or ceilings; high-humidity or wet locations include kitchen areas and adjacent service areas, areas with showers, janitor basins, gang toilets, mechanical penthouses and mechanical spaces with steam, hot water or condensation generating equipment.
 - a. Available Products:
 - 1) DensArmor Plus Interior Guard by G-P Gypsum.

- 2) EXP Extreme by National Gypsum.
- 3. Application: Sheathing.
 - a. Basis-of-Design: Dens-Glass Gold Exterior Guard by G-P Gypsum; Type X.
 - b. Other Available Product: CertainTeed GlasRoc Brand Sheathing; Type X.
- 4. Application: Shaftwall.
 - a. Basis-of-Design: Dens-Glass Ultra Shaft Guard by G-P Gypsum.
 - b. Contractor Option: The contractor may provide the following instead of Basis-of-Design Product.
 - 1) Fire-Shield Shaftliner XP panels by National Gypsum.
 - 2) Sheetrock Brand Gypsum Liner Panels Mold Tough by USG.
- B. Sheathing Joint and Penetration Treatment:
 - 1. Silicone Emulsion Sealant: ASTM C 834, compatible with sheathing tape and sheathing, recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

2.4 ACCESSORIES

- A. Acoustic Insulation: 1; preformed glass fiber, friction fit type, unfaced. Match wall thickness.
- B. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
 1. Comply with low-emitting requirements specified in Section 01 61 16.
- C. Finishing Accessories: ASTM C1047, galvanized steel or plastic paper-faced, unless otherwise indicated.
 - 1. Types: As detailed or required for finished appearance.
 - 2. Available products include the following:
 - a. Grabber Construction Products: No-Coat Prefinished Corners.
 - b. US Gypsum Company; Beadex Paper-Faced Metal Drywall Bead and Trim.
- D. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
 - 1. Joint Tape: Paper for interior applications; 10-by-10 glass mesh for exterior locations and glass mat gypsum wallboard; 2 inch wide.
 - 2. Ready-mixed vinyl-based joint compound.
- E. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
- F. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.
- G. Adhesives Applied within the Building Waterproofing Envelope: Comply with low-emitting requirements specified in Section 01 61 16.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that project conditions are appropriate for work of this section to commence.
- 3.2 SHAFT WALL INSTALLATION
 - A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
 1. Install studs at spacing required to meet performance requirements.
 - B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.

3.3 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
- 3.4 BOARD AND GLASS MAT FACED BOARD INSTALLATION
 - A. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
 - B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - 1. Exception: Tapered edges to receive joint treatment at right angles to framing.
 - C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
 - D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
 - E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
 - 1. Cut boards at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
 - a. Install boards with a 3/8-inch setback where non-load-bearing construction abuts structural elements.
 - b. Install boards with a 1/4-inch setback where they abut masonry or similar materials that might retain moisture, to prevent wicking.
 - 2. Coordinate 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 exterior wall assembly.
 - 3. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.
 - 4. Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.
 - 5. Screw-attach boards at perimeter and within field of board to each steel stud; space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
 - 6. Seal sheathing joints according to sheathing manufacturer's written recommendations.
 - a. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed sealant in entire face of tape.
 - b. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered.
 - c. Seal other penetrations and openings.
 - F. Exterior Soffit Board: Install perpendicular to framing, with staggered end joints over framing members or other solid backing.
 - 1. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
 - 2. Fasten with corrosion-resistant screws.

- 3. Apply glass-fiber tape to glass mat faced gypsum board joints, and apply and trowel silicone emulsion sealant to embed sealant in entire face of tape.
- 4. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered.
- 5. Seal other penetrations and openings.
- 6. Prepare for specified finish according to manufacturer's instructions.
- G. Glass Mat Faced Gypsum Board: Install in strict accordance with manufacturer's instructions.
- H. Installation on Metal Framing: Use screws for attachment of all gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
- I. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.5 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 2. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.6 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
 - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
 - 5. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.7 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal partition, ceiling, and soffit framing.
- B. Framing accessories.

1.2 REFERENCE STANDARDS

- A. ASTM A653/A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- B. AISI SG02-1 North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- C. ASTM C645 Standard Specification for Nonstructural Steel Framing Members; 2011a.
- D. ASTM C665 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- E. ASTM C754 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
- F. ASTM C1002 Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2007.
- G. SSPC-Paint 20 Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
 - 2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.
- C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, limitations, and head to structure connectors, showing compliance with requirements.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- E. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 35 14, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
- F. LEED Submittals: Provide documentation of VOC content in g/L for acoustical sealant applied within the building waterproofing envelope; comply with VOC limits of Section 01 61 16.

1.4 PROJECT CONDITIONS

A. Coordinate the placement of components to be installed within stud framing system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:
 - 1. ClarkDietrich Building Systems LLC: www.clarkdeitrich.com.
 - 2. Marino: www.marinoware.com.
 - 3. Telling Industries; www.buildstrong.com.
- B. Grid Suspension System for Gypsum Board Ceilings and Bulkheads:
 - 1. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - 2. Chicago Metallic Corporation; Drywall Furring System.
 - 3. USG Corporation; Drywall Suspension System.
- C. Regional Content: Provide at least 25 percent of steel manufactured and of primary raw materials extracted or recovered within 500 mile radius of Project Site.

2.2 FRAMING MATERIALS

- A. Recycled Content: Provide steel with at least 25 percent post-consumer recycled content.
- B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
 - 1. Studs: C shaped with flat or formed webs with knurled faces.
 - a. Typical: Minimum 0.0283 inch, 22 gage (27 mil) except when reference standard states a more stringent requirement.
 - b. At door and glazed opening jambs, and framing supporting ceramic tile: Minimum 0.0312 inch, 20 gage (30 mil) except when reference standard states a more stringent requirement.
 - c. Note: The Architect will accept "Effective Thickness" listed UltraSTEEL Framing, with independent test data.
 - 2. Runners: U shaped, sized to match studs.
 - 3. Ceiling Channels: C shaped.
 - 4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- C. Loadbearing Studs: As specified in Section 05 40 00.
- D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
- E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
 - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50, with G60/Z180 hot dipped galvanized coating.
 - 3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
 - 4. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
- F. Tracks and Runners: Same material and thickness as studs, bent leg retainer notched to receive studs .

- G. Furring and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.
- H. Fasteners: ASTM C1002 self-piercing tapping screws.
- I. Sheet Metal Backing: 0.036 inch thick, galvanized.
- J. Anchorage Devices: Power actuated.
- K. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced.
- L. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
 1. Comply with low-emitting requirements specified in Section 01616.
- M. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I Inorganic.

2.3 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

- 3.1 INSTALLATION OF STUD FRAMING
 - A. Comply with requirements of ASTM C754.
 - B. Extend partition framing to structure where indicated and to ceiling in other locations.
 - C. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - D. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
 - E. Align and secure top and bottom runners at 24 inches on center.
 - F. Place one bead of acoustic sealant between runners and substrate, studs and adjacent construction.
 - G. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
 - H. Install studs vertically at spacing indicated on drawings.
 - I. Align stud web openings horizontally.
 - J. Secure studs to tracks using crimping method. Do not weld.
 - K. Stud splicing is not permissible.
 - L. Fabricate corners using a minimum of three studs.
 - M. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings.
 - N. Coordinate erection of studs with requirements of door frames; install supports and attachments.
 - O. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
 - P. Provide metal backup plates as required to accommodate the wall hung casework, millwork, railings or other items mounted to metal stud and wallboard walls and partitions; provide plates up to 8 feet in length as one-piece units.

3.2 CEILING AND SOFFIT FRAMING

- A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- B. Install furring independent of walls, columns, and above-ceiling work.
- C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
- D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
- E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- F. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
- G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.
- H. Laterally brace suspension system.
- I. Contractor Option Grid Suspension System for Gypsum Board Ceilings and Bulkheads: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

3.3 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet.
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

SECTION 09 30 00 - TILING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Cementitious backer board as tile substrate.
- D. Stone thresholds.
- E. Ceramic trim.
- F. Waterproofing and crack isolation membrane.

1.2 REFERENCE STANDARDS

- A. ANSI A108 Series/A118 Series/A136.1 American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2011.
 - 1. ANSI A108.1a American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2011.
 - 2. ANSI A108.1b American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar; 2011.
 - 3. ANSI A108.1c Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex Portland Cement
 - 4. ANSI A108.4 American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2011.
 - 5. ANSI A108.5 American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2011.
 - 6. ANSI A108.6 American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 2011.
 - 7. ANSI A108.8 American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 2011.
 - 8. ANSI A108.9 American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2011.
 - 9. ANSI A108.10 American National Standard Specifications for Installation of Grout in Tilework; 2011.
 - 10. ANSI A108.11 American National Standard for Interior Installation of Cementitious Backer Units; 2011.
 - ANSI A108.12 American National Standard Specifications for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
 - 12. ANSI A108.13 American National Standard Specifications for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).
 - 13. ANSI A118.4 American National Standard Specifications for Latex-Portland Cement Mortar; 2011.
 - 14. ANSI A118.7 American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2010 (Revised).

- 15. ANSI A118.9 American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2011.
- 16. ANSI A137.1 American National Standard Specifications for Ceramic Tile; 2008.
- B. TCNA (HB) Handbook for Ceramic, Glass, and Stone Tile Installation; 2011.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 Product Requirements, for additional provisions.
 - 2. Extra Tile: 2 percent of each size, color, and surface finish combination, but not less than one box of each type.
- H. LEED Report: Accurately document the use of recycled materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
- I. LEED Submittals: Provide documentation of VOC content in g/L for grout, primer, grout sealer, adhesives and sealants applied within the building waterproofing envelope; comply with VOC limits of Section 01 61 16.
- 1.4 QUALITY ASSURANCE
 - A. Maintain one copy of The Tile Council of North America Handbook and ANSI A108 Series/A118 Series on site.
- 1.5 PRE-INSTALLATION MEETING
 - A. Convene one week before starting work of this section.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.
- 1.7 FIELD CONDITIONS
 - A. Do not install adhesives in an unventilated environment.
 - B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.
- 1.8 EXTRA MATERIALS
 - A. Furnish quantity of one full box of each tile type and color selected.
 - B. Turn over any cut tile exceeding 50 percent of a full tile, as extra materials.

PART 2 PRODUCTS

2.1 TILE

- A. Quarry Tile : ANSI A137.1, and as follows:
 - 1. Moisture Absorption: 0.5 to 3.0 percent.
 - 2. Size and Shape: 6 inch square.
 - 3. Thickness: 3/4 inch.
 - 4. Edges: Square.
 - 5. Surface Finish: Unglazed.
 - 6. Colors: To be selected by Architect from manufacturer's full range including all price groups. A maximum 50 percent of floor tile will be selected from the highest price group.
 - 7. Trim Units: Matching cove base shapes in sizes coordinated with field tile.
- B. Porcelain Floor Tile: ANSI A137.1, conforming to the following:
 - 1. Moisture Absorption: 0 to 0.5 percent.
 - 2. Breaking Strength: ASTM C648; greater than 300 pounds.
 - 3. Coefficient of Friction: ASTM C1028.
 - a. Wet: 0.60 or greater.
 - b. Dry: 0.80 or greater.
 - 4. Toilet Rooms (Wall Tile):
 - a. Field Tile:
 - 1) Size: 12 inches by 24 inches.
 - 2) Basis-of-Design: Volume 1.0 Glazed Porcelain by Daltile.
 - b. Accent Tile:
 - 1) Size: 12 inches by 12 inches.
 - 2) Basis-of-Design: Volume 1.1 Glazed Porcelain by Daltile.
 - 5. Corridors (Wall Tile):
 - a. Field Tile:
 - 1) Size: 12 inches by 12 inches.
 - 2) Basis-of-Design: Volume 1.0 Glazed Porcelain by Daltile.
 - b. Accent Tile:
 - 1) Size: 12 inches by 12 inches.
 - 2) Basis-of-Design: Volume 1.1 Glazed Porcelain by Daltile.
 - 6. Toilet Rooms (Floor Tile):
 - a. Field Tile:
 - 1) Size: 12 inches by 24 inches.
 - 2) Basis-of-Design: Volume 1.0 Glazed Porcelain by Daltile.
 - 7. Shape: Square.
 - 8. Edge: Cushioned.
 - 9. Surface Finish: Unglazed.
 - 10. Color:
 - a. At corridor walls:
 - 1) Provide accent tile at ELA's and adjacent door niches to be accent tile.
 - 2) Provide 10% accent tile at all locations besides ELA's and adjacent door niches.

2.2 TRIM AND ACCESSORIES

A. Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.

- 1. Applications: Use in the following locations:
 - a. Open Edges: Bullnose.
 - b. Inside Corners: Jointed.
 - c. Floor to Wall Joints: Cove base.
- 2. Manufacturer: Same as for tile.
- B. Thresholds: Marble, gray, honed finish; 5 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.
 - 1. Applications: Provide at the following locations:
 - a. At doorways where tile terminates, unless indicated otherwise.

2.3 SETTING MATERIALS

- A. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
 - 1. Products:
 - a. Custom Building Products: www.custombuildingproducts.com.
 - b. Bonsal American, Inc: www.sakrete.com.
 - c. Bostik Inc: www.bostik-us.com..
 - d. MAPEI Corporation.
 - e. TEC Specialty Products, Inc.

2.4 GROUTS

- A. Manufacturers:
 - 1. Bonsal American, Inc: www.sakrete.com
 - 2. Bostik Inc: www.bostik-us.com.
 - 3. Custom Building Products: www.custombuildingproducts.com.
 - 4. MAPEI Corporation.
 - 5. TEC Specialty Products, Inc.
- B. Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
 - 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
 - 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 - 3. Color(s): As selected by Architect from manufacturer's full line.
 - 4. Grout installed within building interior: VOC content not to exceed 65 g/L.

2.5 THIN-SET ACCESSORY MATERIALS

- A. Waterproofing and Crack Isolation Membrane: Fluid-applied acrylic-based membrane with reinforcing mesh, complying with ANSI A118.10.
 - 1. Basis-of-Design: Mapei Corporation; Mapelastic HPG with Fiberglass Mesh.
 - 2. Equivalent product of listed setting and grouting material manufacturers.
 - 3. Location: All tile floors; full coverage.
- B. Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced, 5/8 inch thick; 2 inch wide coated glass fiber tape for joints and corners.
 - 1. Product: Durock Brand Cement Board manufactured by United States Gypsum Company.
 - 2. Location: Wet walls and high-humidity areas.
- C. Tile Backer Panel:
 - 1. Mold-resistance: Passes ASTM D 3273.

- 2. Compliance with Standards: Meets ASTM C 1278 and meets or exceeds the physical requirements of ASTM C 630 and ASTM c 1178.
- 3. Use: Approved by manufacturer for use as tile backer panel.
- 4. No paper face.
- 5. Basis-of-Design: Fiberock Brand Aqua-Tough Interior Panel manufactured by United States Gypsum Company.
- 6. Contractor Option: DensShield Tile Backer manufactured by Georgia-Pacific.
- 7. Location: Walls not requiring cementitious backer board as specified.
- D. Metal Edge Strips:
 - 1. Open Edge of Tile with Adjacent Finish of Similar Height:
 - a. General: 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, stainless steel; ASTM A 666, 300 Series exposed-edge material.
 - b. Basis-of-Design: 1.1 Schluter-SCHIENE Edge-protecting Profile; stainless steel.
 - 2. Open Edge of Tile with Adjacent Finish of Different Height:
 - a. General: ADA-compliant profile, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications, stainless steel; ASTM A 666, 300 Series exposed-edge material.
 - b. Basis-of-Design:
 - 1) 1.2 Schluter-RENO-U Reducer Profile, where tile surface is higher than adjacent finish; stainless steel.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.

3.3 INSTALLATION - GENERAL

- A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and The Tile Council of North America Handbook recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install thresholds where indicated.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- I. Allow tile to set for a minimum of 48 hours prior to grouting.
- J. Grout tile joints. Use standard grout unless otherwise indicated.
- K. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
- 3.4 INSTALLATION FLOORS THIN-SET METHODS
 - A. Provide specified waterproofing and crack isolation membrane for all tile floor areas; install in accordance with TCA Method F122, with latex-portland cement grout.

3.5 INSTALLATION - FLOORS - MORTAR BED METHODS

- A. Freezer/Cooler Quarry Tile Thick Set with Reinforcement and Waterproofing: Install by conventional bed TCA Handbook Method F121; epoxy grout.
- B. Mortar Bed Thickness: Contractor to coordinate with depth of slab depression.
- 3.6 INSTALLATION SHOWERS AND BATHTUB WALLS
 - A. At tiled shower receptors install in accordance with The Tile Council of North America Handbook Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls. Latex-Podrtland cement mortar bond coat with latex-Pordtland cement grout. Waterproof membrane turned up walls a minimum of 6 inches above finished floor.
- 3.7 INSTALLATION WALL TILE
 - A. Over cementitious backer units on studs, install in accordance with The Tile Council of North America Handbook Method W244, using membrane at toilet rooms.
 - B. Over interior concrete and masonry install in accordance with The Tile Council of North America Handbook Method W202, thin-set with dry-set or latex-Portland cement bond coat.
 - C. Shower Walls:
 - 1. Over interior concrete and masonry install in accordance with TCA Handbook Method W211, bonded mortar bed with latex-Portland cement bond coat; with latex-Portland cement grout.
 - 2. Include waterproofing membrane over mortar bed of W211.

3.8 CLEANING

A. Clean tile and grout surfaces.

3.9 **PROTECTION**

- A. Do not permit traffic over finished floor surface for 4 days after installation.
- B. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.
- C. 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.

SECTION 09 51 00 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.2 REFERENCE STANDARDS

- A. ASTM C635 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2007.
- B. ASTM E1264 Standard Classification for Acoustical Ceiling Products; 2008e1.
- C. UL (FRD) Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items; show the following:
 - 1. Ceiling suspension system members.
 - 2. Method of attaching suspension system hangers to building structure.
 - 3. Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
 - 4. Minimum Drawing Scale: 1/8 inch = 1 ft.
- C. Product Data: Provide data on suspension system components.
- D. Samples: Submit two full size samples illustrating material and finish of acoustical units.
- E. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.
- F. LEED Submittals: Provide documentation of Noise Reduction Coefficient (NRC) for all cor learning spaes.

1.4 QUALITY ASSURANCE

A. Fire-Resistive Assemblies: Complete assembly listed and classified by UL for the fire resistance indicated.

1.5 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.6 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size units equal to 12 cases.
 - 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of amount installed.

PART 2 PRODUCTS

2.1 ACOUSTICAL UNITS

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. CertainTeed Corporation: www.certainteed.com.
 - 3. USG: www.usg.com.
- B. Acoustical Units General: ASTM E1264, Class A.
 - 1. Units for Installation in Fire-Rated Suspension System: Listed and classified for the fire-resistive assembly the suspension system is a part of.
- C. Classroom Acoustical Ceiling: Minimum Noise Reduction Coefficient (NRC) of 0.70.

2.2 SUSPENSION SYSTEM(S)

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. CertainTeed Corporation: www.certainteed.com.
 - 3. Chicago Metallic Corporation: www.chicagometallic.com.
 - 4. USG: www.usg.com.
- B. Suspension Systems General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, and perimeter moldings as required.
- C. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
 - 1. Profile: Tee; 15/16 inch wide face for types APC and APC-2; 9/16 inch wide face for type APC-4.
 - 2. Construction: Double web.
 - 3. Finish: White painted.

2.3 EXTRUDED PERIMETER TRIM

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc; Product Axiom: www.armstrong.com.
 - 2. Chicago Metallic Corporation; Product Infinity: www.chicagometallic.com.
 - 3. USG; Product Compasso: www.usg.com.
- B. Location:
 - 1. Edge trim system for transitions between drywall and suspended ceilings.
 - Boundry trim system for isolated hung areas of suspended ceilings.
 a. Knife Edge and Angle type as indicated on the drawings.
- C. Components:
 - 1. Extruded aluminum alloy 6063 trim channel.

- 2. Attachment to grid system is provided by tee-bar connection clips which lock into bosses on the trim channel and are screw-attached to the web of the intersecting suspension system members.
- 3. Sections of trim are joined together using the splice plate.

2.4 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
 - 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
- C. Acoustical Sealant For Perimeter Moldings: Specified in Section 07 90 05 and low-emitting requirements as specified in Section 01 61 16.
- D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.1 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install in bed of acoustical sealant.
 - 2. Use longest practical lengths.
 - 3. Overlap and rivet corners.
- K. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.2 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units with pattern parallel to longest room axis.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges.
- H. Where round obstructions occur, provide preformed closures to match perimeter molding.
- I. Install hold-down clips on panels within 20 ft of an exterior door.
- 3.3 TOLERANCES
 - A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
 - B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.
- 3.4 SCHEDULE
 - A. Acoustical Panels Type APC: ASTM E1264, Type III, Form 2; conforming to the following:.
 - 1. Thickness: 3/4 inch.
 - 2. Composition: Mineral.
 - 3. Light Reflectance: 0.85 or better; ASTM E1477.
 - 4. NRC Range: 0.70 or better; ASTM C423.
 - 5. Edge: Square.
 - 6. Surface Color: White.
 - 7. Surface Finish: Non-directional fine texture.
 - 8. Shall withstand combined effects of temperatures to 104 degrees F and relative humidity to 90 percent without visible sag.
 - 9. Ten-year warranty for sag resistance.
 - 10. Basis-of-Design Product: Armstrong World Industries, Inc., Fine Fissured Item #1713.
 - 11. Other acceptable manufacturers:
 - a. Certainteed Ceilings.
 - b. USG Interiors, Inc.
 - 12. Size: 24 inches x 48 inches.
 - 13. Grid: Heavy-duty 15/16-inch exposed face.
 - B. Acoustical Panels Type APC-2: ASTM E1264, Type IV, Form 2; conforming to the following:
 - 1. Thickness: 3/4 inch.
 - 2. Composition: Mineral.
 - 3. Light Reflectance: 0.90 or better; ASTM E1477.
 - 4. NRC Range: 0.75 or better; ASTM C423.
 - 5. Edge: Square.
 - 6. Surface Color: White.
 - 7. Surface Finish: Non-directional fine texture.
 - 8. Shall withstand combined effects of temperatures to 104 degrees F and relative humidity to 90 percent without visible sag.

- 9. Ten-year warranty for sag resistance.
- 10. Basis-of-Design Product: Armstrong World Industries, Inc., Ultima Item #1900.
- 11. Other Approved Manufacturers:
 - a. CertainTeed Ceilings.
 - b. USG Interiors, Inc.
- 12. Size: 24 inches x 24 inches.
- 13. Grid: Heavy-duty 15/16-inch.
- C. Acoustical Panels Type APC-4: ASTM E1264, Type XII, Form 2; conforming to the following:
 - 1. Thickness: 1 inch.
 - 2. Composition: Fiberglass.
 - 3. Light Reflectance: 0.90 or better; ASTM E1477.
 - 4. NRC Range: 0.95 or better; ASTM C423.
 - 5. Edge: Square Tegular.
 - 6. Surface Color: White.
 - 7. Surface Finish: Non-directional fine texture.
 - 8. Shall withstand combined effects of temperatures to 104 degrees F and relative humidity to 90 percent without visible sag.
 - 9. Ten-year warranty for sag resistance.
 - 10. Basis-of-Design Product: Armstrong World Industries, Inc.; Techzone Optima Item #3261.
 - 11. Equal product by:
 - a. CertainTeed Ceilings.
 - b. USG Interiors, Inc.
 - 12. Size: 24 inches x 72 inches.
 - 13. Grid: Heavy-duty 9/16-inch exposed face.

SECTION 09 52 50 - INTERACTIVE ACOUSTICAL PANEL SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes sound-absorbing and sound-diffusing acoustical panels for the instrumental and general music rooms.
- B. Related Sections include the following:
 - 1. Division 9 Section "Acoustical Panel Ceilings" for acoustical ceiling panels supported by exposed suspension system and tested for noise reduction.
 - 2. Division 9 Section "Acoustical Wall Panels" for shop-fabricated panels for other locations.

1.2 SYSTEM DESCRIPTION

- A. Provide a system of sound-absorbing and sound-diffusing panels for reducing sound energy levels and improving the hearing environment.
- B. Absorber panels: Wall- and ceiling-mounted, impact resistant; sound absorbing throughout audio spectrum; fabric-wrapped.
- C. Diffuser Panels: Wall-mounted; impact resistant cylindrical section with two faceted ends; fabric-wrapped.
- D. Ceiling Diffuser Panels (Type APC-3): Ceiling-mounted, impact resistant cylindrical section with two faceted sides, white finish.
- E. Mounting Hardware:
 - 1. Wall Mounting (Absorbers and Diffusers): Mount with concealed metal brackets, designed to allow panels of same size to be interchanged. Provide 2-inch clearance above top of absorbers and diffusers as required for proper mounting.
 - 2. Ceiling Mounting (Absorbers and Standard Diffusers): Mount with four corner hooks suspended by wire ceiling. Provide with lay-in hardware for ceiling grid mounting or direct ceiling mounting.

1.3 SUBMITTALS

- A. Product Data: For each type of acoustical wall panel specified.
- B. Shop Drawings: Indicate fabrication and installation of acoustical wall panels including plans, elevations, sections, details of components, and attachments to other construction. Include elevations showing acoustic room components sizes, arrangements, and details of each condition of installation. Show fabrication and installation details.
 - 1. Indicate variations from basis of design unit sizes and layout shown on drawings, based upon performance of proposed products.
 - 2. Provide acoustic engineering calculation results based on a full acoustical analysis using octave band frequencies from 125Hz to 4,000 Hz and a graphic representation of each room's acoustical properties prior to and after installation of acoustical room components.
 - a. Base calculations on proposed supplier's specific products.
 - b. Indicate absorption and reverberation time properties complying with design requirements, utilizing octave band frequencies from 125 Hz to 4,000 Hz, based upon Fitzroy formulas.
 - c. Show room response at 125 to 4000 Hz octave bands a.) empty; b.) untreated and occupied; and c.) treated and occupied. Failure to submit these calculation data will result in rejection of the proposed supplier's product.

- d. Calculations based upon NRC data alone do not meet the requirements of this specification. Submission of data sheets indicating coefficients of absorption for various products does not constitute an analysis, nor does NRC-value comparisons of one product to another.
- e. The specifier will not address product comparisons to determine equality. Only the analysis that is submitted prior to bidding, per instructions, will determine acceptability.
- C. Samples for Initial Selection: Submit 12-inch-square units of each type of acoustical panel required and in each color, texture, and pattern for facing materials. Include representative samples of installation devices and accessories.
- D. Samples for Verification: Full-size units of each selected color and pattern of acoustical panel required.
- E. Manufacturer Certificates: Signed by manufacturers certifying that products comply with requirements.
- F. Maintenance Data: For interactive acoustical panel system to include in maintenance manuals.
- G. Warranty: Special warranty specified in this Section.
- H. LEED Submittals: For acoustical performance of ceiling system in Core Learning Spaces, documentation indicating Noise Reduction Coefficient (NRC).
- 1.4 QUALITY ASSURANCE
 - A. Source Limitations for Acoustical Wall Panels: Obtain each color, grade, finish, type, and variety of acoustical wall panels from one source with resources to provide products of consistent quality in appearance and physical properties.
 - B. Fire-Test-Response Characteristics: Provide acoustical wall panels 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. Identify acoustical wall panels with appropriate markings of applicable testing and inspecting agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
 - C. Manufacturer Qualifications: Approved manufacturer listed in this section, with minimum 5 years experience in manufacture of acoustic room components.
 - 1. Manufacturers must submit the following:
 - a. Acoustical analysis and proposed layout for this project as described in Submittals Article above.
 - b. Samples of each component of product specified, when requested by Architect.
 - c. Project references: Minimum of 5 installations not less than 5 years old, with owner contact information.
 - d. Sample warranty.
 - 2. Approved manufacturers must meet separate requirements of Submittals Article.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect interactive acoustical wall panels from excessive moisture in shipment, storage, and handling. Deliver in unopened bundles and store in a dry place with adequate air circulation.
- B. Do not deliver material to building until wet-work has been completed and cured to a condition of equilibrium.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Do not begin installation until spaces for acoustical wall panels have been enclosed and maintained at approximately the same humidity and temperature conditions as planned for occupancy. Maintain temperature and humidity as recommended by panel manufacturer.
- B. Field Measurements: Check actual wall surfaces by accurate field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work. Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating acoustical wall and ceiling panels without field measurements. Coordinate wall and ceiling construction to ensure that actual opening dimensions correspond to established dimensions.

1.7 COORDINATION

A. Store, handle, protect and install absorptive materials, including fabrics materials, in accordance with the Construction IAQ Management Plan required by Division 1 Specifications.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of interactive acoustical panel system components that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: 3 years from date of Substantial Completion.

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. Absorber Panels: Full-size units equal to 2 percent of amount installed, but no fewer than 4 units.
 - 2. Diffuser Panels: Full-size units equal to 1 percent of amount installed for each size and type indicated, but no fewer than 4 units of each size and type.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for interactive acoustical panel system is based on Wenger Corporation; Interactive Acoustical Panel System. Subject to compliance with requirements, and giving preference to products having recycled content, provide the named product or a comparable product by one of the following:
 - 1. Conwed; Respond Wall and Ceiling Diffusers.
 - 2. Kinetics Noise Control; Modified Hardside and Diffusers.
 - 3. Wall Technology, Inc.; Customline Diffusers.
 - 4. AVL Systems, Inc.
- 2.2 INTERACTIVE ACOUSTICAL PANEL SYSTEM
 - A. Absorber Panels: Manufacturer's standard fabrication of 6 lb./cu. ft. fiberglass board with foil backing (no exposed fiberglass), metal or hardened epoxy edged frames, covered with Class A rated fabric according to ASTM E 84. Support brackets are integrated into the metal edged frame or back of panel to receive mounting hardware.

- B. Diffuser Panels:
 - 1. Ceiling diffuser manufacturer's standard construction of thermo-molded plastic, 0.125-inch material thickness.
 - 2. Type I wall diffuser manufacturer's standard construction of thermo-molded plastic, 0.125-inch material thickness.
 - 3. Type II wall diffuser manufacturer's standard construction of thermo-molded plastic, 0.125-inch material thickness, with glass fiber board glued to concave rear surface of wall panels greater that or equal to 24 sq. ft.
 - 4. Provide panels with wall or ceiling mounting hardware as required.
- C. Mounting Hardware: Manufacturer's standard; furnish mounting clips and wall channel brackets for wall panels. Standard ceiling panels to be supplied with hooks for wire suspension, supports, supports for lay-in grid applications or for direct ceiling mounting.
- D. Finishes:
 - 1. Wall-Mounted Panels: Manufacturer's standard woven plain weave 100 percent polyester 2-ply fabric wrapping entire core and frame and glued to back of frame; colors as selected from manufacturer's standard range.
 - 2. Ceiling-Mounted Panels: Manufacturer's standard white, "orange peel" texture.
 - 3. Ceiling-Mounted Absorber Panels: Manufacturer's standard woven plain weave 100 percent polyester 2-ply fabric wrapping entire core and frame and glued to back of frame; colors as selected from manufacturer's standard range.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of acoustical wall panels.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION, GENERAL
 - A. Install interactive acoustical wall panels with vertical surfaces and edges plumb, top edges level, and in alignment with other panels, scribed to fit adjoining work accurately at borders and at penetrations. Comply with panel manufacturer's printed instructions for installation of panels using type of mounting accessories as recommended by manufacturer. Cut units to be at least 50 percent of unit width, with facing material extended over cut edge to match uncut edge. Scribe acoustical wall panels to fit adjacent work. Butt joints tightly.
 - B. Construction Tolerances: As follows:
 - 1. Variation from Plumb and Level: Plus or minimum 1/8 inch.
 - 2. Variation of Joints from Hairline: Not more than 1/8 inch.
- 3.3 CLEANING
 - A. Clean panel facing upon completion of installation to remove dust and other foreign materials from the facing, using a dry brush, a vacuum, or both.
 - B. Remove surplus materials, rubbish, and debris resulting from acoustical wall panel installation, upon completion of the Work, and leave areas of installation in a neat and clean condition.

3.4 PROTECTION

A. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensures that acoustical wall panels are without damage or deterioration at the time of Substantial Completion. Replace panels that cannot be cleaned and repaired, in a manner acceptable to the Architect, prior to the time of Substantial Completion.

SECTION 09 54 50 - FRP CEILING SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Glass-fiber panel ceiling system; GFC on Drawings.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete at ceilings.
- 1.2 RELATED REQUIREMENTS
 - A. Section 07 90 05 Joint Sealers.
- 1.3 REFERENCE STANDARDS
 - A. ASTM A 641/A 641M Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - B. ASTM C 635 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - C. ASTM C 636 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - D. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - E. ASTM E 1264 Standard Classification for Acoustical Ceiling Products.

1.4 SUBMITTALS

- A. See Section 01300 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on each type of product indicated.
- C. Coordinate 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.
- D. Samples for Initial Selection: For each type of glass-fiber ceiling panel and suspension system indicated.
- E. Product Certificate: Signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- F. LEED Submittals: For sealants applied within the building waterproofing envelope, documentation including printed statement of VOC content in g/L.
- G. Maintenance Data: For finishes to include in maintenance manuals.
- H. Warranty: Special warranty specified in this Section
- 1.5 QUALITY ASSURANCE
 - A. Source Limitations: Obtain each type through one source from a single manufacturer.

- B. Fire-Test-Response Characteristics: Provide glass-fiber panel ceilings that comply with the following requirements:
 - Surface-Burning Characteristics: Provide glass-fiber 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:
 a. Smoke-Developed Index: 450 or less.
- C. Regulatory Requirements: Exposed surfaces meet or exceed USDA and FSIS requirements.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver glass-fiber 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 glass-fiber panels, permit them to reach room temperature and a stabilized moisture content.
 - C. Handle glass-fiber panels carefully to avoid chipping edges or damaging units in any way.
- 1.7 PROJECT CONDITIONS
 - A. Environmental Limitations: Do not install glass-fiber 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 glass-fiber 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 GLASS-FIBER PANELS, GENERAL
 - A. Glass-fiber Ceiling System Colors: As selected by Architect from manufacturer's standard range of colors.
- 2.2 GLASS-FIBER CEILING PANELS
 - A. Products:
 - 1. Kemlite Company, Inc.; Glasbord FX with Surfseal.
 - 2. Chicago Metallic; DynaGlass.
 - B. Lay-In Ceiling Panels:
 - 1. Size: 24 by 48 inches.
 - 2. Pattern: Embossed.
 - 3. Nominal Thickness: 0.12 inch.
- 2.3 GLASS-FIBER SUSPENSION SYSTEMS, GENERAL
 - A. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.
 - B. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

- 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
- 2. 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.
- 2.4 GLASS-FIBER SUSPENSION SYSTEM FOR GLASS-FIBER PANEL CEILING
 - A. Products:
 - 1. Kemlite Company, Inc.; Sanigrid II Fiberglass Ceiling Grid System.
 - 2. Chicago Metallic; DynaGlass FRP Suspension Ceiling System.
 - B. Suspension System: Main and cross runners formed from glass-fiber that is moisture resistant (does not support mold or mildew and will not rust or corrode).
 - 1. Wall Angles: 12-foot long length fastened directly to wall with nylon drive rivets.
 - 2. Hold-Down Clips: Provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.
 - 3. Face Design: Flat, flush.
 - 4. Accessories: Provide connector clips, wall anchors, and other accessories as required for complete installation.

2.5 SEALANT

A. Sealant: Refer to Section 07 90 00 and Section 01 61 16.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which glass-fiber 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 glass-fiber 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 glass-fiber 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.Protection of In-Place Conditions:
- 3.3 INSTALLATION
 - A. General: Install glass-fiber panel ceilings to comply with ASTM C 636, 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. 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.

- 4. 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.
- 5. 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 glass-fiber ceiling area and where necessary to conceal edges of glass-fiber panels.
 - 1. Apply glass-fiber 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 glass-fiber 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 glass-fiber panels as follows:
 - a. Install panels with pattern running in one direction parallel to long axis of space.
 - 2. Install panels with edges fully hidden from view by flanges of suspension system runners and moldings.

3.4 CLEANING

A. Clean exposed surfaces of glass-fiber 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.

SECTION 09 64 29 - WOOD STRIP FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wood strip flooring, nailed.
- B. Secondary subflooring.
- C. Sleepers.
- D. Sheet vapor retarder.
- E. Surface finishing .
- F. Location: At Stage Only.

1.2 REFERENCE STANDARDS

A. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; Maple Flooring Manufacturers Association; current edition.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for flooring, floor finish materials, and subfloor materials.
- C. Shop Drawings: Indicate floor joint pattern and termination details.
- D. Samples: Submit two samples 1 1/2 inch x 6 inch in size illustrating floor finish, color, and sheen.
- E. Maintenance Data: Include maintenance procedures.
- F. LEED Report: Submit documentation for wood products made from sustainably harvested wood, use of recycled materials and local/regional materials, as required by Division 01 LEED sections and appropriate forms, and Section 013 00.
- G. LEED Submittal: Provide documentation of VOC content in g/L for adhesives, primers and finishes applied within the building waterproofing envelope; document no added urea formaldehyde for plywood.

1.4 QUALITY ASSURANCE

- A. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body. All non-FSC wood in assemblies with FSC-certified wood shall meet the FSC Controlled Wood (CW) criteria.
- B. Perform work of this section in accordance with MFMA (SPEC).1. Maintain one copy of document on site.
- C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- D. Installer Qualifications: Company specializing in performing work of this section with minimum five years experience.

1.5 FIELD CONDITIONS

- A. Do not install wood flooring until wet construction work is complete and ambient air at installation space has moisture content stabilized at maximum moisture content of 40 percent.
- B. Provide heat, light, and ventilation prior to installation.

- C. Store materials in area of installation for minimum period of 24 hours prior to installation.
- D. Maintain minimum room temperature of 65 degrees F for a period of two days prior to delivery of materials to installation space, during installation, and after installation.

1.6 WARRANTY

A. Field Finish Flooring Systems: Warrant the Work of this Section for two years against defective or nonconforming materials and workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wood Strip Flooring :
 - 1. Location: Stage.
 - 2. Species: White Hard Maple.
 - 3. Grade: Second and better.
 - 4. Cut: Mixed grain (flat and edge grain).
 - 5. Moisture Content: 7 to 9 percent.
 - 6. Actual Thickness: 25/32 inch.
 - 7. Actual Width: 1-1/2 inches.
 - 8. Edge: Tongue and Groove.
 - 9. End: End matched.
 - 10. Length: Random, minimum of 9 inches.
- B. Flooring Nails: Type recommended by flooring manufacturer.
- C. Sleepers and Shims: Softwood lumber, pressure treated for moisture protection, 2 x 4 inch size.
- D. Secondary Subflooring: 23/32 inch thick plywood, with tongue and groove edges; Exposure 1, sanded, preservative treated. No added urea formaldehyde.
- E. Vapor Retarder: Black polyethylene sheet, 8 mil thick; 2 inch wide tape for joint sealing.
- F. Sheathing Paper: Paper type recommended by wood flooring manufacturer.

2.2 ACCESSORIES

- A. Ventilating Base: Molded rubber, 4 inch high with a 1 inch toe, ventilating type, with adhesives and accessories, black.
- B. Floor Finish: Polyurethane, to achieve satin sheen surface; type recommended by flooring manufacturer.
- C. Sealer and Wax: Types recommended by flooring manufacturer.
- D. Adhesives, sealants, paints and coatings applied within the building waterproofing envelope to comply with low-emitting requirements in Section 016116:
 - 1. Wood Flooring Adhesives: VOC content not to exceed 100 g/L.
 - 2. Primers and Sealers: VOC content not to exceed 200 g/L.
 - 3. Clear Wood Finish: VOC content not to exceed 350 g/L.

2.3 SOURCE QUALITY CONTROL

A. Inspect and stamp species and grade on underside of each piece of wood flooring at factory.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/4 inch in 10 feet.
- C. Verify wood subfloor is properly secured, smooth and flat to plus or minus 1/4 inch in 10 feet.
- D. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Sleepers and Shims:
 - 1. Place sleepers over vapor retarder; space sleepers at 12 inches on center.
 - 2. Shim underside of sleepers to achieve level line of plus or minus 1/4 inch in 10 feet.
- B. Secondary Subflooring: Place one layer plywood subflooring direct to concrete substrate.
 - 1. Lay perpendicular to the sleepers, with end joints over sleepers, and nail at 12 inches on center.
- C. Prepare substrate to receive wood flooring in accordance with manufacturer's and MFMA instructions.
- D. Broom clean substrate.

3.3 INSTALLATION

- A. Sheathing Paper: Place over wood subfloor; lap edges and ends 2 inches, staple in place.
- B. Wood Flooring:
 - 1. Install in accordance with manufacturer's and MFMA instructions; predrill and blind nail to wood sub-floor.
 - 2. Lay flooring parallel to length of room areas. Verify alignment as work progresses.
 - 3. Arrange flooring with end matched grain set flush and tight.
 - 4. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar; provide divider strips and transition strips in accordance with flooring manufacturer's recommendations and as indicated.
 - 5. Install edge strips at unprotected or exposed edges, and where flooring terminates.
 - 6. Secure edge strips before installation of flooring with stainless steel screws.
 - 7. Install flooring tight to floor access covers.
 - 8. Provide 3/8 inch expansion space at fixed walls and other interruptions.
- C. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside and outside corners.
- D. Finishing:
 - 1. Mask off adjacent surfaces before beginning sanding.
 - 2. Sand flooring to smooth even finish with no evidence of sander marks. Take precautions to contain dust. Remove dust by vacuum.
 - 3. Apply finish in accordance with floor finish manufacturer's instructions.
 - 4. Apply filler and three finish coats.
 - 5. Apply first coat, allow to dry, then buff lightly with steel wool to remove irregularities. Vacuum clean and wipe with damp cloth before applying succeeding coat.
 - 6. Lightly buff between coats with steel wool and vacuum clean before applying succeeding coat.

7. Apply last coat of finish.

3.4 CLEANING

A. Clean and polish floor surfaces in accordance with manufacturer's instructions.

3.5 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Place protective coverings over finished floors; do not remove coverings until Substantial Completion.

SECTION 09 65 00 - RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Resilient base.
- C. Installation accessories.
- 1.2 RELATED REQUIREMENTS
 - A. Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions.
- 1.3 REFERENCE STANDARDS
 - A. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.
 - B. ASTM F1066 Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2014)e1.
 - C. ASTM F1861 Standard Specification for Resilient Wall Base; 2008.
 - D. NFPA 253 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2011.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- D. Verification Samples: Submit two samples, 12 x 12 inch in size illustrating color and pattern for each resilient flooring product specified.
- E. Certification: Submit written certification by manufacturer declaring products do not contain asbestos.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- G. LEED Report: Accurately document the use of recycled materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16, appropriate forms, and Section 01 60 00.
- H. LEED Submittals: Provide documentation of VOC content in g/L for adhesives and sealants; comply with VOC limits of Section 01 61 16.

1.5 FIELD CONDITIONS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.1 TILE FLOORING

- A. Vinyl Composition Tile (See Alternate): Homogeneous, with color extending throughout thickness, and:
 - 1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 - 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - 3. Size: 12 by 12 inch.
 - 4. Thickness: 0.125 inch.
 - 5. Pattern: Marbleized.
 - 6. Colors and Pattern: As selected by Architect from manufacturer's full range of colors for tile of class, wearing surface, thickness, size and pattern specified.
 - a. Patterns of full size units to be provided by Architect.
 - b. Patterns requiring cutting to be expected at locations of curved ceiling patterns; curved ceiling patterns/bulkheads indicated by reflected ceiling plans to matched with floor tile installation, whether indicated or not, to be confirmed by Architect.
 - c. Floor Patterns:
 - 1) Provide 4-color pattern in Corridors, Dining, Media, Lobby, and Vestibules.
 - 2) Provide 2-color pattern in Classrooms.
 - 3) Provide 2-color pattern at Gymnasium (not including feature strip colors).
 - 7. Standard VCT Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong; Standard Excelon Imperial Texture, Multicolor.
 - b. Azrock; Cortina Colors and Cortina Compliment.
 - c. Mannington; Essentials.
 - d. Tarkett; Expressions.
- B. High-performance Vinyl Composition Tile (See Alternate): Homogeneous, with color extending throughout thickness, and:
 - 1. Minimum Requirements: Comply with ASTM F 1066, of Class corresponding to type specified.
 - 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - 3. Size: 12 x 12, 18 x 18 or 24 x 24 inches.
 - 4. Thickness: 0.10 inch.
 - 5. Pattern: Through pattern.
 - 6. Colors and Pattern: As selected by Architect from manufacturer's full range of colors for tile of class, wearing surface, thickness, size and pattern specified.
 - a. A maximum of 8 colors will be selected for tile, from solid and chip design palettes.
 - b. Patterns of full size units to be provided by Architect.
 - c. Patterns requiring cutting to be expected at locations of curved ceiling patterns; curved ceiling patterns/bulkheads indicated by reflected ceiling plans to matched with floor tile installation, whether indicated or not, to be confirmed by Architect.
 - d. Feature Strips: Of same material as flooring, 2 inch wide; 24 inch lengths; solid color.
 - 1) Location: Additional straight gymnasium game lines other than basketball court.

- e. Floor Patterns:
 - 1) Provide 4-color pattern in Corridors, Dining, Media, Lobby, and Vestibules.
 - 2) Provide 2-color pattern in Classrooms.
 - 3) Provide 2-color pattern at Gymnasium (not including feature strip colors).
- 7. Performance Characteristics:
 - a. High-performance compressed composition tile containing 67 percent natural quartz particles and minimum 30 percent recycled content.
 - b. Indentation Resistance (ASTM F 970 modified): 2100 psi.
 - c. Wear Resisitance: Light Industrial; EN649.
- 8. Provide at locations indicated by Alternate Bid descriptions within the Contract Documents.
- 9. High-performance VCT Products: Subject to compliance with requirements, provide one of the following:
 - a. Upofloor, Mosaic Collection; www.upofloor.com.
 - b. Procedo Versa Quartz.
- 10. Basketball Court Line Insets:
 - a. Factory cut line package for basketball game lines, including radius lines; 2 inch wide lines.
 - b. Basis-of-Design: Basketball Court Unit (modified) by Armstrong World Industries.
 - c. Field cut court lines will not be accepted.
 - d. Color: One color to be selected by Architect; black or other standard color offered by other acceptable manufacturer.

2.2 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
 - 1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 - 2. Height: 4 inch.
 - 3. Thickness: 0.125 inch thick.
 - 4. Finish: Satin.
 - 5. Length: Roll.
 - 6. Color: Color as selected from manufacturer's standards.
 - 7. Emissions: Emissions: FloorScore Certified.
 - 8. Manufacturers:
 - a. Johnsonite, Inc.: www.jonsonite.com.
 - b. Burke Flooring: www.burkemercer.com.
 - c. Roppe Corp: www.roppe.com.
 - d. Nora Systems, Inc.: www.nora.com .
 - e. NPlus.
- 2.3 ACCESSORIES
 - A. Subfloor Filler: Latex-modified, portland cement based or blended hydraulic cement based formulation; type recommended by adhesive material manufacturer.
 - B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
 - 1. Comply with low-emitting requirements specified in Section 01 61 16.
 - C. Moldings, Transition and Edge Strips: Metal.

- D. Sealer and Wax: Types recommended by flooring manufacturer.
 - 1. Comply with low-emitting requirements specified in Section 01 61 16.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
 - B. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.
 - C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
 - D. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
 - E. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
 - 1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
 - 2. Alkalinity: pH range of 5-9.
 - F. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is cured.
- C. Clean substrate.
- D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.
- B. 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 in pattern indicated.
- C. 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 in pattern of colors and sizes indicated.
- D. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Before installation of flooring, secure metal strips with stainless steel screws.
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- G. Install flooring in recessed floor access covers. Maintain floor pattern.
- H. At movable partitions, install flooring under partitions without interrupting floor pattern.

3.5 RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.6 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.
- C. Vinyl Composition Tiles: Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.
 - 1. Per Owners requirements, use Bullen ECLEANpolish.
 - 2. Coordinate application of floor polish with Owner's maintenance service; first application by Contractor.
 - 3. Vinyl floors to be given five coats of Bullen ECLEAN polish; after each polish coat, buff floors to an even luster with an electric polishing machine; final polish coat application must be completed minimum 48 hours prior to Owner's occupancy.

3.7 **PROTECTION**

- A. Prohibit traffic on resilient flooring for 48 hours after installation.
- B. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.

C. 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.

SECTION 09 66 23 - RESINOUS MATRIX TERRAZZO FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Epoxy matrix terrazzo with ground finish.
- B. Divider strips.
- C. Epoxy matrix terrazzo floor and base.
- D. Stairs treads, risers, and landings.
- E. Divider strips .
- F. Crack isolation membrane.

1.2 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Restrictions.

1.3 REFERENCE STANDARDS

- A. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- B. NTMA (GRAD) Aggregate Gradation Standards; The National Terrazzo and Mosaic Association, Inc.; current edition.
- C. NTMA (SPECS) Terrazzo Specifications; The National Terrazzo and Mosaic Association, Inc.; current edition located at www.ntma.com.
- D. NTMA Technical Bulletin 111.
- E. ASTM F2170-11 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for divider strips, control joint strips, expansion joints, and sealer; include printed copy of current NTMA recommendations for type of terrazzo involved.
- C. Shop Drawings: Indicate divider strip and control joint layout, and details of adjacent components.
- D. Samples: Submit two samples, minimum 8 x 8 inch in size illustrating color, chip size and variation, chip gradation, matrix color and typical divider strip.
 - 1. Final color selection to be determined during sample review process.
- E. Cleaning and Maintenance Data: Include procedures for stain removal, stripping, and sealing.
- F. Provide instructions to maintain floors in compliance with ADAAG minimum slip retardant requirements for accessible route.

1.5 QUALITY ASSURANCE

- A. Manufacturer Experience:
 - 1. Submit proof of associate membership in NTMA.
 - 2. Furnish a list of at least five (5) epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years of the same scope, complexity and at least 50 percent of the square footage.

- B. Qualification Data: For qualified installer.
 - 1. Submit proof of Contractor membership in NTMA.
 - 2. Furnish a list of at least five (5) epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years fo the same scope, complexity and at least 50 percent of the square footage.
- 1.6 MOCK-UP
 - A. Construct mock-up of terrazzo illustrating appearance of finished work in each configuration required. Size mock-up to be not less than 100 square feet.
 - B. Locate where directed.
 - C. Mock-up may remain as part of the work.
 - D. Accepted mock-up to be quality reference standard for balance of Project.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Store materials in their original, undamaged packages and containers inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity.
 - B. Storage temperatures should be between 50°F to 80°F (10.0°C to 26.6°C).
 - C. Keep products away from fire or open flame.

1.8 FIELD CONDITIONS

- A. Prior to surface preparation, terrazzo contractor shall:
 - 1. Evaluate slab condition, including slab moisture content and extent of repairs required, if any.
 - 2. Maintain the ambient room and floor temperature at 60°F (15.5°C) or above for a period extending 72 hours before, during and after floor installation. Concrete to receive epoxy terrazzo shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted according to ASTM F2170 (determining relative humidity in concrete slabs using in situ probes). Proceed with installation only after substrates have a maximum relative humidity measurement reading less than 75%. If relative humidity measurement reading is greater than or equal to 75%, Moisture Vapor Treatment is required. Apply to terrazzo substrates according to manufacturers instructions.
- B. Prior to and during each day of installation, the terrazzo contractor shall verify that the dew point is at least 5°F (-15°C) less than the slab and air temperature.
- C. Acceptable Substrates:
 - 1. Level tolerance: Concrete sub-floor shall be level with a maximum variation from level of 1/4" in 10 feet (6.4 mm in 3.1m). Any irregularity of the surface requiring patching and/or leveling shall be done using epoxy and sand fill.
 - Concrete floor shall be prepared mechanically by shot blasting in accordance with ICRI Guideline No. 03732. Specifically, surface preparation results should achieve a CSP3-CSP5 profile.
 - 3. Concrete floor shall receive a steel trowel finish.
 - 4. Concrete shall be cured a minimum of 28 days. No curing agents are to be used in areas to receive terrazzo.
 - 5. Saw cutting of control joints must be done between 12 and 24 hours after placement of the structural concrete and at a frequency compatible to ACI recommendations.

1.9 WARRANTY

- A. Terrazzo materials and installation shall be warranteed for a period of (2) years from date of substantial completion.
- B. Warranty shall include the repair and/or replacement of materials or workmanship found to be defective per NTMA standards.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Terroxy/Terazzo and Marble Supply Companies.
- B. Sherwin-Williams Company: General Polymers Brand: www.generalpolymers.com.
- C. Dex-O-Tex.

2.2 EPOXY MATRIX TERRAZZO APPLICATIONS

- A. Floors and Stairs:
 - 1. Thickness: 3/8 inch, nominal.
 - 2. Aggregate Type: Marble chips.
 - 3. Aggregate Size: No. 2.

2.3 PREQUALIFIED CONTRACTORS

- A. Contractor shall use one of the following pre-qualified subcontractors:
 - 1. David Allen Company; www.davidallen.com.
 - 2. Roman Mosaic.
 - 3. Boatman and Mangnani.

2.4 MATERIALS

- A. Epoxy Matrix Terrazzo Topping: Aggregate and matrix mix applied to substrate, leveled, and ground smooth.
- B. Primer: Manufacturers recommended primer for substrate.
- C. Moisture Vapor Treatment: Contractor to include MVT for all slabs on-grade, light weight concrete and green concrete.
 - 1. Physical properties of moisture mitigating primer shall have a maximum of 0.3 perms with 100% RH.
- D. Flexible Reinforcing Membrane: for substrate crack preparation and reflective crack reduction.
 1. Reinforcement: fiberglass scrim.
- E. Epoxy Matrix: Epoxy Matrix and in color required for mix indicated.
 - 1. Physical properties without aggregates. All specimens cured for 7 days at 73-77°F (22.8-25- °C) and 50 percent plus or minus 2 percent RH.
- F. Aggregate: Type as indicated; sized in accordance with NTMA Aggregate Gradation Standards; color(s) as indicated, uniform in color.
- G. Finishing Grout: Epoxy, color to match terrazzo matrix.

2.5 ACCESSORIES

A. Divider Strips: 1/8 inch thick zinc exposed top strip, zinc coated steel concealed bottom strip, with anchoring features.

- B. Control Joint Strips: 1/8 inch nominal width zinc exposed top strips, zinc coated steel concealed bottom strips, 1/8 inch wide joint between strips sealed with flexible joint filler.
- C. Divider and Control Joint Strip Height: To suit thickness of terrazzo topping, with allowance for grinding.
- D. Base Cap, Base Divider Strip, and Separator Strip: Match divider strips.
- E. Cleaner: Neutralizing liquid type, pH of 7.
- F. Sealer: Colorless, non-yellowing, penetrating liquid type to completely seal matrix surface; not detrimental to terrazzo components.
 - 1. Compliant with ADAAG minimum slip requirements for accessible routes.
 - 2. Provide minimum 0.6 static slip coefficient; minimum 0.8 for ramps.
 - 3. Compliant with VOC limits of Section 01 61 16.
- G. Subfloor Filler: Epoxy type.
- H. Primer: Type recommended by manufacturer and compliant with VOC limits of Section 01 61 16.
- I. Moisture Mitigation: Type recommended by manufacturer and compliant with VOC limits of Section 01 61 16.
- J. Crack Isolation Membrane: Manufacturer's resinous membrane for substrate-crack preparation and reflective-crack reduction.
 - 1. Reinforcement: Fiberglass scrim.

2.6 MIXES

- A. Color Plate Selection: To be selected by Architect.
- B. Proportion epoxy terrazzo topping in accordance with resin manufacturer's recommendations.
- C. Charge and mix marble chips and epoxy resins in strict accordance with manufacturer's instructions.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive terrazzo.
 - B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive terrazzo.
 - C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of materials to sub-floor surfaces.
 - D. Verify that concrete sub-floor surfaces are ready for terrazzo installation by testing per ASTM 2170 for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
 - 1. Alkalinity: pH range of 5 to 9, tested according to ASTM F710.
 - 2. Test each concrete floor substrate, regardless of age and grade level, for moisture.
 - 3. Conduct test around perimeter of area or room, at columns, and where moisture may be evident.
 - 4. Prepare diagram of area or room showing location and results of each test.
 - E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare concrete substrate to "open" surface pores by means of vacuum shot blasting.
 - 1. Blast concrete surface to a Concrete Surface Profile between CSP 3 and CSP 5 as defined by the International Concrete Repair Institute.
- B. Remove all contaminating or bond breaking substances, including but not limited to, dust, laitance, curing compounds, coatings, sealers, oil and grease; any oil or grease not removed by vacuum blasting must be chemically removed.
- C. Acid etching is not acceptable.
- D. Remove spalled or deteriorated concrete; repair damaged concrete with epoxy fill from terrazzo resin manufacturer latex fills or self- leveling underlayments are not acceptable
- E. Divider Strips and Joint Details in accordance with NTMA Technical Bulletin 111:
 - 1. Install strips in adhesive setting bed without voids below strips or mechanically anchor strips as required to attach strips to substrate.
 - 2. Control/Construction Joints (saw cut, cold joint):
 - a. Preferred: Separate double L-type angles back to back with minimum 1/8" (3.2mm) width between. Fill joint and area between strips with semi-flexible joint filler.
 - 3. Expansion Joint Strips: Separate double L-type angles, positioned back to back with minimum 1/8" (3.2 mm) width between. Fill area between strips with semi-flexible joint filler.
 - 4. Random Crack Detail: For cracks over 1/16" width before surface preparation. Fill saw cut with 100% solids epoxy, followed by application of crack membrane (40 mils / 1.0mm) with fiberglass mesh reinforcement embedded into the membrane. Note: Movement from the substrate may reflect through the finished flooring.

3.3 INSTALLATION

- A. Install divider and control joint strips straight and level to locations indicated.
- B. In corridors, provide expansion divider strips, including base spaced not more than 30 feet on centers, preferably at column lines, as directed by the Architect.
- C. Include adequate anchorage of metal strips, spaced not more than 6 inches to anchor noted strips to subfloor.
- D. Install base and border divider and control joint strips to match floor pattern.
- E. Install terminating cap strip at top of base; attach securely to wall substrate.
- F. Place terrazzo mix over substrate to thickness indicated.

3.4 APPLICATION - TERRAZZO

- A. Place terrazzo mix over prepared substrate to 3/8 inch thick.
- B. Trowel to a dense flat surface to the top of divider strips.

3.5 CURING

- A. Close area to allow undisturbed curing.
- B. Allow epoxy terrazzo to cure for 24 hours.
- 3.6 FINISHING
 - A. Finish terrazzo to NTMA requirements and to polish specified.

- B. Produce terrazzo finish surface to match approved mockup, with 70 to 75 percent chip exposed.
- C. Grind terrazzo surfaces with power disc machine; sequence with coarse to fine grit abrasive, using a wet method.
 - 1. Polish to 200 grit diamond polish.
- D. Apply patch mix to match mortar over ground surface to fill honeycomb exposed during grinding.
- E. Remove patch coat by grinding, using a fine grit abrasive.
- F. Hand grind vertical and curved surfaces similarly.

3.7 TOLERANCES

- A. Maximum Variation from Flat Surface: 1/4 inch in 10 feet.
- B. Maximum Variation from Level (Except Surfaces Sloping to Drain): 1/8 inch.

3.8 CLEANING

- A. Scrub and clean terrazzo surfaces with cleaner in accordance with manufacturer's instructions. Let dry.
- B. Immediately after terrazzo has dried, apply sealer in accordance with manufacturer's instructions.
- C. Seal and polish surfaces, in accordance with manufacturer's instructions.

3.9 PROTECTION

- A. Protect finished terrazzo from damage due to subsequent construction until Date of Substantial Completion.
- B. Do not permit construction traffic over finished terrazzo surfaces.

SECTION 09 84 00 - ACOUSTIC ROOM COMPONENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fabric-covered fiberglass core panels and mounting accessories.
- B. Cementitious wood fiber wall panels.

1.2 REFERENCE STANDARDS

- A. ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.
- B. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- C. ASTM E795 Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2005 (Reapproved 2012).

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.
- C. Shop Drawings: Fabrication and installation details, panel layout, and fabric orientation.
- D. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available .
- E. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and fabric covering.
- F. LEED Submittal: Provide documentation of recycled content and location of manufacture; include product data indicating wall system low-emitting requirements as specified in Section 01 61 16.

1.4 QUALITY ASSURANCE

- A. Warranty Period for Cementitious Wood Fiberboard Wall Panels: Lifetime.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. Protect acoustical panels from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until panels are needed for installation.
 - B. Store panels flat, in dry, well-ventilated space; do not stand panels on end.
 - C. Protect panel edges from damage.
 - D. Store, handle, protect and install absorptive materials, including fabrics materials, in accordance with the Construction IAQ Management Plan required by Division 1 Specifications.

PART 2 PRODUCTS

- 2.1 FABRIC-COVERED ACOUSTICAL PANELS (Type AP-1)
 - A. Manufacturers:
 - 1. Basis-of-Design: Kinetics Noise Control; High-Impact Hardside Panels.
 - 2. AVL Systems.
 - 3. Conwed Designscape an Owens Corning Company.

- 4. Essi Acoustical Products.
- 5. Panel Solutions, Inc.
- 6. Sound Concepts Acoustical Products.
- 7. Wall Technology, Inc.
- B. Panels: Prefinished, factory assembled fabric-covered panels.
 - 1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- C. Fiberglass Core Panels:
 - 1. 1/8-inch- thick layer of compressed molded glass-fiber board with a minimum nominal density of 16 to 18 lb/cu. ft. laminated to face of core.
 - 2. Core Density: 6 to 7 lb/cu ft.
 - 3. Noise Reduction Coefficient (NRC): Not less than 0.90 for 2-inch panel, when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
 - 4. Corners: Square.
 - 5. Mounting: Back mounting.
- D. Fabric Covering: Seamless fabric facing material, for stretched covering of core material.
 - 1. Manufacturer: Maharam.
 - 2. Product Line/Pattern: Meduim and/or Milestone.
 - 3. Color: As selected from full color line.
 - 4. Fiber Content: 100 percent woven polyester.
 - 5. Applied Treatments: Stain resistance.
- 2.2 CEMENTITIOUS WOOD FIBERBOARD WALL PANELS (Type AP-2)
 - A. Manufacturer:
 - 1. Tectum, Inc.
 - B. Cementitious Wood Fiberboard Wall Panels: Manufacturer's standard panel construction consisting of a cementitious wood fiberboard attached directly to wall; to be field painted, and complying with the following requirements:
 - 1. Panel Thickness: 2 inches
 - 2. Finish: Natural for field painting; minimum 4 different colors.
 - 3. Panel Widths: As indicated.
 - 4. Edge Detail: Beveled.
 - 5. Panel Lengths: As indicated.
 - 6. Noise Reduction Coefficient: NRC of not less than 0.60.
 - 7. Binders: Composite wood product shall be produced with binders containing no urea-formaldehyde.

2.3 FABRICATION

- A. Fabric Wrapped, General: Fabricate panels to sizes and configurations indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.
- B. Resin harden perimeter edges and areas of core for attachment of mounting brackets.
- C. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.
- 2.4 ACCESSORIES
 - A. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:

1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.

PART 3 EXECUTION

- 3.1 INSTALLATION
 - A. Install acoustical panels in locations indicated, following installation recommendations of panel manufacturer. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
 - B. Install panels to construction tolerances of plus or minus 1/16 inch for the following:
 - 1. Plumb and level.
 - 2. Flatness.

3.2 CLEANING

- A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.
- B. Remove surplus materials, trimmed portions of panels, and debris resulting from installation.

3.3 PROTECTION

- A. Provide protection of installed acoustical panels until completion of the work.
- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Concrete masonry unites (CMU).
 - 2. Steel.
 - 3. Galvanized metal.
 - 4. Wood.
 - 5. Gypsum board.
 - 6. Cotton or canvas insulation coverings.
 - 7. Exposed PVC piping.

1.2 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures, project meetings, progress schedules and documentation, reports, coordination.

1.3 **DEFINITIONS**

- A. Gloss Ranges:
 - 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. Semigloss 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 REFERENCE STANDARDS

- A. ASTM D 3359 Standard Test Methods for Mearsuring Adhesion by Tape.
- B. SSPC (PM1) Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings.

1.5 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for each type of product submitted.
- C. LEED Submittal: Provide documentation of VOC content in g/L for primers, paints and coatings applied within the building waterproofing envelope.
- D. Samples for Initial Selection: Submit each type of topcoat product indicated.
- E. Samples for Verification: Submit each type of paint system and each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, minimum 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- F. Product List: Submit each product indicated, include the following:

- 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
- G. Maintenance Materials: Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 - 1. Quantity: Furnish an additional 5 percent, but not less than 2 gal. of each material and color applied.

1.6 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.

1.7 MOCK-UP

- A. Benchmark Samples (Mock-ups): Provide benchmark finish sample (all coats) for each coating type and substrate.
 - 1. Architect will select several rooms or surfaces to represent surfaces and conditions, for application of each paint system type and substrate; colors will be provided for Benchmark Samples.
 - a. Wall Surfaces: Complete minimum 100 square feet.
 - b. Small Areas and Items: Apply systems to items designated by the Architect.
 - 2. Complete Benchmark Samples per the requirements of this Section.
 - a. Provide required sheen, color and texture for each surface.
 - b. Architect-accepted Benchmark Samples to establish level of quality for remainder of Work.
 - 3. Architect to provide final color approvals from Benchmark Samples and intermediate coat wall colors; refer to subsection 3.3 of this Section.
 - 4. Benchmark samples to be prepared by individuals performing the remaining Work for this Project.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F and a maximum 90 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.9 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Benjamin Moore & Co.
- B. Glidden Professional.
- C. PPG Industries.
- D. Sherwin-Williams Company.

2.2 PAINT, GENERAL

A. Material Compatibility:

- 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Paints and coatings applied within building waterproofing envelope to comply with the following VOC content limits as expressed in grams per Liter, less water and exempt compounds, of Green Seal Standard GS-11 "Paints," First Edition, May 20, 1993; Green Seal Standard GC-03 "Anti-Corrosive Paints," Second Edition, January 7, 1997; and SCAQMD Rule #1113 "Architectural Coatings," January 1, 2004 as follows:
 - 1. Flat Paint, Coating or Primer: 50
 - 2. Non-flat Paint, Coating or Primer: 150
 - 3. Anti-corrosive & Anti-rust Paint (ferrous metal substrates): 250
 - 4. Concrete Curing Compound: 350
 - 5. Dry-fog Coatings: 400
 - 6. Floor Coatings (opaque): 100
 - 7. Graphic Arts (sign) Coatings: 500
 - 8. Industrial Maintenance Coatings: 250
 - 9. Mastic Coatings: 300
 - 10. Primers, Sealers and Undercoaters: 200
 - 11. Traffic Coatings: 150
 - 12. Waterproofing Sealer: 250
 - 13. Waterproofing Concrete, Masonry Sealers: 400
 - 14. Wood Preservatives: 350
- C. Colors:
 - 1. As selected by Architect from manufacturer's full range.
 - 2. Different colors may be used in the same room.
 - 3. Colors of frames may be different than doors.
 - 4. Colors for ceilings and trim may be different from walls, and walls may be more than one color or striped.
 - 5. Dark tints may be used on metal frames that may require more coats than that indicated on paint schedule for proper coverage; apply as many coats as necessary for complete hide.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Wood: 15 percent.
 - 2. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions [and compatibility with existing finishes and primers].
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. Use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- C. Seal surfaces that might cause bleed through or staining of topcoat.
- D. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- E. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.
- F. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- G. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Passivated Galvanized Steel: Clean with a water-based industrial strength cleaner, and/or "Brush Blast" in accordance with SSPC-SP7. After the surface has been prepared, apply recommended primer to a small area. Allow primer to cure for 7 days, and test adhesion using the "cross-hatch adhesion tape test" method in accordance with ASTM D 3359. If the

adhesion of the primer is positive, proceed with a recommended coating system for galvanized metal.

- J. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- K. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- L. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 COLOR COORDINATION

- A. Tint intermediate coats for wall surfaces to match color sample selections.
- B. Architect will visit the Project within 7 days after notification, to review primed walls for final color coordination.
- C. Allow 3 week days in schedule for Architect to change final wall colors between intermediate coat and remaining coat(s).
- D. Allow time to order final paint colors; do not order final paint colors until obtaining final color approvals.

3.4 APPLICATION

- A. 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. Wall Surfaces: Receive final color approvals following Architect's review of Intermediate Coats, before proceeding.
 - 3. Omit primer over metal surfaces that have been shop primed and touchup painted.
 - 4. 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.
 - 5. 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.
- B. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. 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.

- a. 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.
- 3. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
- 4. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- 5. Finish doors on tops, bottoms, and side edges the same as faces.
- C. Block Fillers:
 - 1. Apply two coats of block filler to concrete masonry block at a rate to ensure complete coverage with pores filled.
 - 2. Perform a squeegee operation on second coat to fill all crevices and produce a smooth surface; do not remove filler material from surface with the squeegee operation.
- D. 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.
 - 1. Wall Surfaces: Tint Prime Coat a lighter shade to facilitate identification; tint Prime Coat to match color of finish coat, but provide sufficient difference in shade to distinguish Prime Coat from Intermediate Coat used for final color selections.
 - 2. Other Surfaces: Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- E. 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.
- F. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- G. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- H. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:
 - 1. Mechanical Work:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Tanks that do not have factory-applied final finishes.
 - e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
- f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
- g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
- 2. Electrical Work:
 - a. Switchgear.
 - b. Panelboards.
 - c. Electrical equipment that is indicated to have a factory-primed finish for field painting.
 - d. Exposed wiremold and conduit in all finished spaces to match color of wall.
- I. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
 - 1. Prefinished items include the following factory-finished components:
 - a. Architectural woodwork.
 - b. Acoustical wall panels.
 - c. Metal toilet enclosures.
 - d. Metal lockers.
 - e. Elevator entrance doors and frames.
 - f. Elevator equipment.
 - g. Finished mechanical and electrical equipment.
 - h. Light fixtures.
 - 2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Ceiling plenums.
 - d. Utility tunnels.
 - e. Pipe spaces.
 - f. Duct shafts.
 - g. Elevator shafts.
 - 3. Finished metal surfaces include the following:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper and copper alloys.
 - e. Bronze and brass.
 - 4. Operating parts include moving parts of operating equipment and the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 - 5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
 - 6. Items indicated to receive other finishes.
 - 7. Items indicated to remain unfinished.
 - 8. Floors, unless specifically so indicated.
 - 9. Ceramic and other tiles.
 - 10. Acoustical materials, unless specifically so indicated.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. CMU Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Interior/exterior latex block filler.
 - 1) Latex Block Filler 285; Benjamin Moore & Co.
 - 2) Concrete Coatings Block Filler Interior/Exterior Primer 3010-1200; Glidden Professional.
 - 3) SPEEDHIDE 6-7 Interior/Exterior Masonry Latex Block Filler; PPG Industries.
 - 4) S-W PrepRite Block Filler, B25W25; Sherwin-Williams Company (The).
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
 - 4) S-W ProGreen 200 Eg-Shel, B20s; Sherwin-Williams Company.
 - c. Topcoat: Institutional low-odor/VOC interior latex (eggshell).
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
 - 4) S-W ProGreen 200 Eg-Shel, B20; Sherwin-Williams Company.
- B. Spot Prime for Field Connections and Touch Up for Structural Elements:
 - 1. Thoroughly examine structural elements for bare spots and abraded surface; spot prime for full coverage.
 - 2. Extend spot prime minimum 6 inches beyond edge of field connections.
 - 3. Waterborne Enamel System:
 - a. Prime Coat:
 - 1) SUPER SPEC HP Acrylic Metal Primer P04; Benjamin Moore & Co.
 - 2) Devflex 4020PF Direct to Metal Primer & Flat Finish; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.
 - 4) Pro Industrial Pro-Cryl® Universal Primer, B66-310 Series; Sherwin-Williams Company.

C. Steel Substrates:

a.

- 1. Quick-Drying Enamel System: Shop prime.
 - Prime Coat: Quick-drying alkyd metal primer.
 - 1) SUPER SPEC Shop-Coat Metal Primer P14; Benjamin Moore & Co.
 - 2) Devflex 4020PF Direct to Metal Primer & Flat Finish; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.
 - 4) Kem Bond HS Universal Metal Primer, B50NZ3 Series; Sherwin-Williams.
- 2. Water-Based Dry-Fall System:
 - a. Prime Coat: Waterborne dry fall.
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Devflex 4020PF Direct to Metal Primer & Flat Finish; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.
 - 4) S-W ProCryl Universal Primer, B66-310 Series; Sherwin-Williams Company.
 - b. Intermediate Coat:
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Waterborne Dryfall Eggshell 1482-1200; Glidden Professional.
 - SPEEDHIDE-SUPER TECH WB- 6-724XI (Low Sheen Semi Gloss) or 6-725XI (flat) Interior 100% Acrylic Latex Dry-Fog; PPG Industries.
 - 4) S-W Waterborne Acrylic Dry Fall, B42W2; Sherwin-Williams Company.
 - c. Topcoat: Waterborne dry fall.
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Waterborne Dryfall Eggshell 1482-1200; Glidden Professional.
 - 3) SPEEDHIDE-SUPER TECH WB- 6-724XI (Low Sheen Semi Gloss) or 6-725XI (flat) Interior 100% Acrylic Latex Dry-Fog; PPG Industries.
 - 4) S-W Waterborne Acrylic Dry Fall, B42W2; Sherwin-Williams Company.
- 3. Institutional Low-Odor/VOC Latex System (Field Primed): Eggshell finish.
 - a. Prime Coat Field Applied: (shop prime with Quick-Drying Enamel System)
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Devflex 4020PF Direct to Metal Primer & Flat Finish; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.
 - 4) S-W ProCryl Universal Primer, B66-310 Series; Sherwin-Williams Company.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
 - 4) S-W ProGreen 200 Low Odor Interior Latex Eg-Shel B20 Series; Sherwin-Williams Company.
 - c. Topcoat: Institutional low-odor/VOC interior latex (eggshell).
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.

- 4) S-W ProGreen Low Odor Interior Latex Eg-Shel B20 Series; Sherwin-Williams Company.
- 4. Waterborne High-Performance Gloss Enamel System: Handrails and railing systems; and items indicated to be gloss finish.
 - a. Prime Coat Field Applied: (shop prime with Quick-Drying Enamel System).
 - 1) SUPER SPEC HP Acrylic Metal Primer P04; Benjamin Moore & Co.
 - 2) Bar-Rust 231Low VOC Multi-Purpose Epoxy Mastic; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.
 - 4) DTM Wash Primer (Galvanized) or WB Tile-Clad Primer (Steel); Sherwin-Williams Company.
 - b. Intermediate Coat: Interior latex matching topcoat.
 - 1) SUPER SPEC HP Waterborne Urethane Gloss Enamel P73; Benjamin Moore & Co.
 - 2) Devthane 379H Aliphatic Urethane Gloss Enamel; Glidden Professional.
 - 3) Pitt-Tech Plus 90-1310 series Interior/Exterior High Gloss DTM Industrial Enamel; PPG Industries.
 - 4) S-W Waterbased Acrolon 100 Urethane, B65W720 Series; Sherwin-Williams Company.
 - c. Topcoat: Interior latex (eggshell).
 - 1) SUPER SPEC HP Waterborne Urethane Gloss Enamel P73; Benjamin Moore & Co.
 - 2) Devthane 379H Aliphatic Urethane Gloss Enamel; Glidden Professional.
 - 3) Pitt-Tech Plus 90-1310 series Interior/Exterior High Gloss DTM Industrial Enamel; PPG Industries.
 - 4) S-W Waterbased Acrolon 100 Urethane, B65W720 Series; Sherwin-Williams Company.
- D. Galvanized-Metal Substrates:
 - 1. Water-Based Dry-Fall System:
 - a. Prime Coat: Waterborne dry fall.
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Waterborne Dryfall Eggshell 1482-1200; Glidden Professional.
 - 3) SPEEDHIDE-SUPER TECH WB- 6-724XI (Low Sheen Semi Gloss) or 6-725XI (flat) Interior 100% Acrylic Latex Dry-Fog; PPG Industries.
 - 4) S-W Waterborne Acrylic Dry Fall, B42W2 (Eggshell); Sherwin-Williams Company.
 - b. Topcoat: Waterborne dry fall.
 - 1) Eggshell Finish Not Available; Benjamin Moore & Co.
 - 2) Waterborne Dryfall Eggshell 1482-1200; Glidden Professional.
 - 3) SPEEDHIDE-SUPER TECH WB- 6-724XI (Low Sheen Semi Gloss) or 6-725XI (flat) Interior 100% Acrylic Latex Dry-Fog; PPG Industries.
 - 4) S-W Waterborne Acrylic Dry Fall, B42W2; Sherwin-Williams Company.
 - 2. Quick-Drying Enamel System: Shop prime.
 - a. Prime Coat: Quick-drying alkyd metal primer.
 - 1) SUPER SPEC HP Universal Metal Primer P07; Benjamin Moore & Co.
 - 2) Devflex 4020PF Direct to Metal Primer & Flat Finish; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.

b.

- 4) Kem Bond HS Universal Primer B50NZ3 Series; Sherwin-Williams Company.
- 3. Institutional Low-Odor/VOC Latex System Over Waterborne Primer System: Semigloss finish.
 - a. Prime Coat Field Applied: (shop prime with Quick-Drying Enamel System)
 - 1) SUPER SPEC HP Acrylic Metal Primer P04; Benjamin Moore & Co.
 - 2) Devflex 4020PF Direct to Metal Primer & Flat Finish; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.
 - 4) S-W ProCryl Universal Primer, B66-310 Series; Sherwin-Williams Company.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Semi-Gloss 376; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Semi-Gloss Paint 1416V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-500 series Interior Semi-Gloss Acrylic Latex; PPG Industries.
 - 4) S-W ProGreen 200 Semi-Gloss, B31-Series; Sherwin-Williams Company.
 - c. Topcoat: Institutional low-odor/VOC interior latex (semigloss).
 - 1) Eco Spec WB Interior Latex Semi-Gloss 376; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Semi-Gloss Paint 1416V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-500 series Interior Semi-Gloss Acrylic Latex; PPG Industries.
 - 4) S-W ProGreen 200 Semi-Gloss, B31-Series; Sherwin-Williams Company.
- 4. Waterborne High-Performance Gloss Enamel System: Provide for interior railing systems and exposed steel stair risers.
 - a. Prime Coat Field Applied: (shop prime with Quick-Drying Enamel System).
 - 1) SUPER SPEC HP Acrylic Metal Primer P04; Benjamin Moore & Co.
 - 2) Bar-Rust 231Low VOC Multi-Purpose Epoxy Mastic; Glidden Professional.
 - 3) Pitt-Tech Plus 90-912 Interior/Exterior DTM Industrial Metal Primer; PPG Industries.
 - 4) DTM Wash Primer (Galvanized) or WB Tile-Clad Primer (Steel); Duron, Inc.
 - Intermediate Coat: Interior urethane matching topcoat.
 - 1) SUPER SPEC HP Waterborne Urethane Gloss Finish P73; Benjamin Moore & Co.
 - 2) Devthane 379H Aliphatic Urethane Gloss Enamel; Glidden Professional.
 - 3) Pitt-Tech Plus 90-1310 series Interior/Exterior High Gloss DTM Industrial Enamel; PPG Industries.
 - 4) S-W Waterbased Acrolon 100 Urethane, B65W720 Series; Sherwin-Williams Company (The).
 - c. Topcoat: Interior latex (gloss).
 - 1) SUPER SPEC HP Waterborne Urethane Gloss Finish P73; Benjamin Moore & Co.
 - 2) Devthane 379H Aliphatic Urethane Gloss Enamel; Glidden Professional.
 - 3) Pitt-Tech Plus 90-1310 series Interior/Exterior High Gloss DTM Industrial Enamel; PPG Industries.
 - 4) S-W Waterbased Acrolon 100 Urethane, B65W720 Series; Sherwin-Williams Company (The).
- E. Dimensional and Dressed Lumber Substrates:
 - 1. Institutional Low-Odor/VOC Latex System: Semigloss finish.
 - a. Prime Coat: Interior latex-based wood primer.
 - 1) Eco Spec WB Interior Latex Primer 372; for bleeding stains use Fresh Start All-Purpose 100 percent Acrylic Primer 023; Benjamin Moore & Co.

- 2) Gripper Interior/Exterior Primer-Sealer 3210-1200; Glidden Professional.
- 3) SEAL Grip 17-921 Interior/Exterior 100% Acrylic Universal Primer/Sealer; PPG Industries.
- 4) S-W PrepRite® ProBlock® Latex Primer, B51 Series; Sherwin-Williams Company.
- b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Semi-Gloss 376; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Semi-Gloss Paint 1416V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-500 series Interior Semi-Gloss Acrylic Latex; PPG Industries.
 - 4) S-W ProGreen 200 Semi-Gloss, B31-600 Series; Sherwin-Williams Company.
- c. Topcoat: Institutional low-odor/VOC interior latex (semigloss).
 - 1) Eco Spec WB Interior Latex Semi-Gloss Finish 528; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Semi-Gloss Paint 1416V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-500 series Interior Semi-Gloss Acrylic Latex; PPG Industries.
 - 4) S-W ProGreen 200 Semi-Gloss, B31-600 Series; Sherwin-Williams Company.
- F. Wood Panel Substrates:
 - 1. Institutional Low-Odor/VOC Latex System: Semigloss finish.
 - a. Prime Coat: Interior latex-based wood primer.
 - 1) Eco Spec WB Interior Latex Primer 372; for bleeding stains use Fresh Start All-Purpose 100 percent Acrylic Primer 023; Benjamin Moore & Co.
 - 2) Gripper Interior/Exterior Primer-Sealer 3210-1200; Glidden Professional.
 - 3) SEAL Grip 17-921 Interior/Exterior 100% Acrylic Universal Primer/Sealer; PPG Industries.
 - 4) ProBlock® Latex Primer, B51 Series; Sherwin-Williams Company.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Semi-Gloss Finish 528; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Semi-Gloss Paint 1416V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-500 series Interior Semi-Gloss Acrylic Latex; PPG Industries.
 - 4) S-W ProClassic Waterborne Acrylic Semi-Gloss, B31 Series; Sherwin-Williams Company.
 - c. Topcoat: Institutional low-odor/VOC interior latex.
 - 1) Eco Spec WB Interior Latex Semi-Gloss Finish 528; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Semi-Gloss Paint 1416V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-500 series Interior Semi-Gloss Acrylic Latex; PPG Industries.
 - 4) S-W ProClassic Waterborne Acrylic Semi-Gloss, B31 Series; Sherwin-Williams Company.
- G. Gypsum Board Substrates:
 - 1. Institutional Low-Odor/VOC Latex System: Eggshell finish.
 - a. Prime Coat: Interior latex primer/sealer.
 - 1) Eco Spec WB Interior Latex Primer, 372; Benjamin Moore & Co.
 - 2) High Hide Interior Primer Sealer 1000-1000; Glidden Professional.
 - 3) SPEEDHIDE 6-2 Interior Latex Sealer Quick-Drying; PPG Industries.
 - 4) S-W ProGreen 200 Interior Latex Primer, B28W600; Sherwin-Williams Company.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.

- 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
- 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
- 4) S-W ProGreen 200 Eg-Shel, B20-650 Series; Sherwin-Williams Company.
- c. Topcoat: Institutional low-odor/VOC interior latex (eggshell).
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
 - 4) S-W ProGreen 200 Eg-Shel, B20-650 Series; Sherwin-Williams Company.
- 2. Institutional Low-Odor/VOC Latex System: Flat finish; ceilings.
 - a. Prime Coat: Interior latex primer/sealer.
 - 1) Eco Spec WB Interior Latex Primer, 372; Benjamin Moore & Co.
 - 2) High Hide Interior Primer Sealer 1000-1000; Glidden Professional.
 - 3) SPEEDHIDE 6-2 Interior Latex Sealer Quick-Drying; PPG Industries.
 - 4) S-W ProGreen 200 Interior Latex Primer, B28W600; Sherwin-Williams Company.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Flat, 373; Benjamin Moore & Co.
 - 2) Ultra-Hide 250 Flat Latex Paint 1200N Series; Glidden Professional.
 - 3) SPEEDHIDE 6-70 series Interior Latex Flat; PPG Industries.
 - 4) S-W ProGreen 200 Flat, B30-600 Series; Sherwin-Williams Company.
 - c. Topcoat: Institutional low-odor/VOC interior latex (flat).
 - 1) Eco Spec WB Interior Latex Flat, 373; Benjamin Moore & Co.
 - 2) Ultra-Hide 250 Flat Latex Paint 1200N Series; Glidden Professional.
 - 3) SPEEDHIDE 6-70 series Interior Latex Flat; PPG Industries.
 - 4) S-W ProGreen 200 Flat, B30-600 Series; Sherwin-Williams Company.
- H. Cotton or Canvas Insulation-Covering Substrates: Including pipe and duct coverings.
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Interior latex primer/sealer.
 - 1) Eco Spec WB Interior Latex Primer 372; Benjamin Moore & Co.
 - 2) Gripper Interior/Exterior Primer-Sealer 3210-1200; Glidden Professional.
 - 3) SPEEDHIDE 6-2 Interior Latex Sealer Quick-Drying; PPG Industries.
 - 4) ProGreen 200 Interior Latex Primer, B28W600; Sherwin-Williams Company.
 - b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
 - 4) ProGreen 200 Eg-Shel, B20-650 Series; Sherwin-Williams Company.
 - c. Topcoat: Institutional low-odor/VOC interior latex (eggshell).
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.

- 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
- 4) ProGreen 200 Eg-Shel, B20-650 Series; Sherwin-Williams Company.
- I. Exposed PVC Piping:
 - 1. Institutional Low-Odor/VOC Latex System over bond coat:
 - a. Bond Coat:
 - 1) STIX Waterborne Bonding Primer SXA-110; Insl-X (Benjamin Moore & Co.)
 - 2) Gripper Interior/Exterior Primer-Sealer 3210-1200; Glidden Professional.
 - 3) SEAL Grip 17-921 Interior/Exterior 100% Acrylic Universal Primer/Sealer; PPG Industries.
 - 4) Adhesion Bonding Primer, B51W50; Sherwin-Williams Company.
 - b. Intermediate Coat: Interior latex matching topcoat.
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
 - 4) ProGreen 200 Eg-Shel, B20-650 Series; Sherwin-Williams Company.
 - c. Topcoat: Interior latex (eggshell).
 - 1) Eco Spec WB Interior Latex Eggshell, 374; Benjamin Moore & Co.
 - 2) Ultra-Hide 150 Interior Latex Eggshell Paint 1412V Series; Glidden Professional.
 - 3) SPEEDHIDE 6-421 series High Solids Interior Enamel Eggshell Latex; PPG Industries.
 - 4) ProGreen 200 Eg-Shel, B20-650 Series; Sherwin-Williams Company.

3.7 INTERIOR PAINTING SCHEDULE - EXISTING AREAS

- A. Wherever alterations and changes occur as a result of Work under the Contract in any room of existing building, except as specifically indicated on Drawings, paint affected ceiling and wall areas as specified under the Standard Painting Applications listed in this Section; the wall or ceiling in which the alterations occur will be painted from natural break to natural break.
- B. Generally, paint color in altered areas will match the adjoining surfaces as closely as possible.
- C. All doors and frames within "Limits of Contract" will be painted on both sides as required by the applicable Master Specifications; new Work, all required coats.
- D. When painting existing surfaces, Contractor bears the responsibility of assuring compatibility of new paint materials with existing.

END OF SECTION

SECTION 09 93 00 - STAINING AND TRANSPARENT FINISHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This Section includes surface preparation and the application of wood finishes on the following substrates:
 - 1. Interior Substrates:
 - a. Dressed lumber (finish carpentry).
 - b. Exposed wood panel products.

1.2 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittal procedures, project meetings, progress schedules and documentation, reports, coordination.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: For each type of product indicated.
- C. Samples for Initial Selection: For each type of product indicated
- D. Samples for Verification: For each type of finish system and in each color and gloss of finish indicated.
 - 1. Submit Samples on representative samples of actual wood substrates, 8 inches square.
 - 2. Label each Sample for location and application area.
- E. Product List: For each product indicated, include the following:
 - 1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules.
- F. LEED Submittals: For Credit EQ 4.2, manufacturers' product data for field-applied finishes, including printed statement of VOC content in g/L.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 - a. Quantity: Furnish an additional 5 percent, but not less than 1 gal. of each material and color applied.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Benjamin Moore & Co.
- B. Glidden Professional/Flood Company.
- C. PPG Industries.
- D. Sherwin-Williams Company.

2.2 MATERIALS, GENERAL

A. Material Compatibility:

- 1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.
- B. Stain Colors: Match Architect's samples.
- C. LEED Compliance: Field-applied wood finishes applied to interior elements can not exceed the VOC content limits established in South Coast Air Quality Management District Rule 1113, Architectural Coatings, rules in effect January 1, 2004.
 - 1. Clear Wood Finishes VOC Limits:
 - a. Varnish 350 g/L.
 - b. Lacquer 550 g/L.
 - 2. Sealers VOC Limits:
 - a. Sanding Sealers: 275 g/L.
 - b. Other Sealers: 200 g/L.
 - 3. Stains VOC Limits: 250 g/L.
 - 4. Shellacs VOC Limits: Clear 730 g/L; pigmented 550 g/L.
- D. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.

2.3 WOOD FILLERS

A. Wood Filler Paste: As recommended by finish manufacturer.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
 - 1. Maximum Moisture Content of Wood Substrates: 15 percent when measured with an electronic moisture meter.
 - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes.
 - 3. Begin finish application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 4. Beginning application of finish system constitutes Contractor's acceptance of substrate and conditions.

3.2 PREPARATION

- A. Remove plates, machined surfaces, and similar items already in place that are not to be finished. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, reinstall items that were removed; use workers skilled in the trades involved. Remove surface-applied protection if any.
- B. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Remove surface dirt, oil, or grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
 - 3. Countersink steel nails, if used, and fill with putty tinted to final color to eliminate rust leach stains.
- C. Apply wood filler paste to open-grain woods, to produce smooth, glasslike finish.

3.3 APPLICATION

- A. Apply in accordance with manufacturer's instructions.
 - 1. Use applicators and techniques suited for finish and substrate indicated.
 - 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. Finish Carpentry Substrates:
 - 1. Polyurethane Varnish Over Stain System:
 - a. Stain Coat: Interior wood stain (semitransparent).
 - 1) OLYMPIC 44500 Preminum Interior Oil Based Wood Stain 240 gpl VOC; PPG Industries.
 - 2) Minwax 250 V.O.C. Compliant WoodFinish Interior Penetrating Stain; Sherwin-Williams Company.
 - 3) Wood Pride Professional Finish Water Based Semi-Transparent Wood Finishing Stain 1700V Series; Glidden Professional.

- b. Two Finish Coats: Interior, waterborne polyurethane (satin).
 - Benwood Stays Clear Acrylic Polyurethane Low Lustre 423; Benjamin Moore & Co.
 - 2) OLYMPIC Preminum Interior Water Based Polyurethane Clear 42786 Stain / 42784 Gloss; PPG Industries.
 - 3) WoodClassics Waterborne Polyurethane Varnish Gloss A68V91 (first coat)/Satin A68F90 (second coat); Sherwin-Williams Company.
 - 4) Wood Pride Professional Finishes Water Based Satin Varnish 1802-0000; Glidden Professional.
- B. Exposed Wood Panel-Product Substrates:
 - 1. Polyurethane Varnish Over Stain System:
 - a. Stain Coat: Interior wood stain (semitransparent).
 - 1) OLYMPIC 44500 Preminum Interior Oil Based Wood Stain 240 gpl VOC; PPG Industries.
 - 2) Minwax 250 V.O.C. Compliant WoodFinish Interior Penetrating Stain; Sherwin-Williams Company.
 - 3) Wood Pride Professional Finish Water Based Semi-Transparent Wood Finishing Stain 1700V Series; Glidden Professional.
 - b. Two Finish Coats: Interior, waterborne polyurethane (satin).
 - Benwood Stays Clear Acrylic Polyurethane Low Lustre 423; Benjamin Moore & Co.
 - 2) OLYMPIC Preminum Interior Water Based Polyurethane Clear 42786 Stain / 42784 Gloss; PPG Industries.
 - 3) WoodClassics Waterborne Polyurethane Varnish Gloss A68V91 (first coat)/Satin A68F90 (second coat); Sherwin-Williams Company.
 - 4) Wood Pride Professional Finishes Water Based Satin Varnish 1802-0000; Glidden Professional.

END OF SECTION

SECTION 09 96 00 - HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This Section includes surface preparation and application of high-performance coating systems on the following substrates:
 - 1. Interior Substrates:
 - a. Concrete masonry units (CMU).
 - b. Gypsum board.
 - 2. Exterior Substrates:
 - a. Exposed steel canopy structure and other rooftop structures.
 - b. Exposed angle lintels and hung plates.

1.2 DEFINITIONS

- A. Gloss Ranges:
 - 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. Semigloss 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.

1.3 REFERENCE STANDARDS

A. SSPC-SP 6/NACE No. 3 - Commercial Blast Cleaning.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: For each type of product indicated.
- C. Samples for Initial Selection: For each type of finish-coat product indicated.
- D. Samples for Verification: For each type of coating system and in each color and gloss of finish coat indicated.
 - 1. Submit Samples on rigid backing, minimum 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- E. Product List: For each product indicated. Cross-reference products to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules.
- F. LEED Submittals: For Credit EQ 4.2, manufacturers' product data for interior coatings, including printed statement VOC content; requirements of coating systems for high humidity areas differ from normal-conditioned spaces.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

a. Quantity: Furnish an additional 5 percent, but not less than 1 gal. of each material and color applied.

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.

1.6 MOCK-UP

- A. Benchmark Samples (Mock-ups): Provide benchmark finish sample (all coats) for each coating type and substrate.
 - 1. Architect will select several rooms or surfaces to represent surfaces and conditions, for application of each paint system type and substrate; colors will be provided for Benchmark Samples.
 - a. Wall Surfaces: Complete minimum 100 square feet.
 - b. Small Areas and Items: Apply systems to items designated by the Architect.
 - 2. Complete Benchmark Samples per the requirements of this Section.
 - a. Provide required sheen, color and texture for each surface.
 - b. Architect-accepted Benchmark Samples to establish level of quality for remainder of Work.
 - 3. Architect to provide final color approvals from Benchmark Samples and intermediate coat wall colors; refer to subsection 3.3 of this Section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F.
- B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Benjamin Moore & Co.
- B. Glidden Professional.
- C. International Paint LLC distributed by McCormick Paints.
- D. PPG Industries.
- E. Sherwin-Williams Company.
- 2.2 HIGH-PERFORMANCE COATINGS, GENERAL
 - A. Material Compatibility:

- 1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. Provide products of same manufacturer for each coat in a coating system.
- B. Paints and coatings applied within building waterproofing envelope to comply with the following VOC content limits as expressed in grams per Liter, less water and exempt compounds, of Green Seal Standard GS-11 "Paints," First Edition, May 20, 1993; Green Seal Standard GC-03 "Anti-Corrosive Paints," Second Edition, January 7, 1997; and SCAQMD Rule #1113 "Architectural Coatings," January 1, 2004 as follows:
 - 1. Flat Paint, Coating or Primer: 50
 - 2. Non-flat Paint, Coating or Primer: 150
 - 3. Anti-corrosive & Anti-rust Paint (ferrous metal substrates): 250
 - 4. Primers, Sealers and Undercoaters: 200
 - 5. Waterproofing Sealer: 250
 - 6. Waterproofing Concrete, Masonry Sealers: 400
- C. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.
- D. Colors: As selected by Architect from manufacturer's full range.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
 - 1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Masonry (CMU): 12 percent.
 - b. Gypsum Board: 12 percent.
 - c. Concrete: 12 percent.
 - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 3. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 4. Coating application indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
 - 1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.
- C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.

- D. CMU Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust and loose mill scale.
 - 1. Clean using methods recommended in writing by coating manufacturer.
 - 2. Blast clean according to SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

3.3 COLOR COORDINATION

- A. Tint intermediate coats for wall surfaces to match color sample selections.
- B. Architect will visit the Project within 7 days after notification, to review primed walls for final color coordination.
- C. Allow 3 week days in schedule for Architect to change final wall colors between intermediate coat and remaining coat(s).
- D. Allow time to order final paint colors; do not order final paint colors until obtaining final color approvals.

3.4 APPLICATION

- A. Apply in accordance with manufacturer's instructions.
- 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. Wall Surfaces: Receive final color approvals following Architect's review of Intermediate Coats, before proceeding.
 - 3. Omit primer over metal surfaces that have been shop primed and touchup painted.
 - 4. If undercoats 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.
 - 5. 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. Apply high-performance coatings according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. 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.
 - a. 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.

- 3. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
- 4. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- D. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- E. 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.
 - 1. Wall Surfaces: Tint Prime Coat a lighter shade to facilitate identification; tint Prime Coat to match color of finish coat, but provide sufficient difference in shade to distinguish Prime Coat from Intermediate Coat used for final color selections.
 - 2. Other Surfaces: Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- F. 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.
- G. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- H. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.
- I. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

3.5 CLEANING

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

- A. Gypsum Board Substrates:
 - 1. Water-Based Epoxy Coating System:
 - a. Prime Coat: Interior latex primer/sealer.
 - 1) Fresh Start All Purpose 100% Acrylic Primer 023; Benjamin Moore & Co.

- 2) Glidden Professional 1000 High-Hide Interior Primer, Glidden Professional.
- 3) Sealzit II Primer-Sealer-Stain Blocker 06443; McCormick Paints.
- 4) SPEEDHIDE 6-2 Interior Latex Sealer Quick-Drying; PPG Industries.
- 5) ProGreen 200 Interior Latex Primer, B28W600 Series; Sherwin-Williams Company.
- b. Intermediate Coat: Water-based epoxy.
 - 1) Super Spec HP Acrylic Epoxy Coating P43; Benjamin Moore & Co.
 - TRU-GLAZE-WB[™] 4426 Waterborne Epoxy Semi-Gloss Coating; Glidden Professional.
 - 3) InterH2O 735; International Paint LLC; distributed through McCormick Paints.
 - 4) Pitt Glaze WB 16-551 series Water Based Epoxy; PPG Industries.
 - 5) Water Based Catalyzed Epoxy Enamel B70; Sherwin-Williams Company.
- c. Topcoat: Water-based epoxy.
 - 1) Super Spec HP Acrylic Epoxy Coating P43; Benjamin Moore & Co.
 - 2) TRU-GLAZE-WB[™] 4426 Waterborne Epoxy Semi-Gloss Coating; Glidden Professional.
 - 3) InterH2O 735; International Paint LLC; distributed through McCormick Paints.
 - 4) Pitt Glaze WB 16-551 series Water Based Epoxy; PPG Industries.
 - 5) Water Based Catalyzed Epoxy Enamel B70; Sherwin-Williams Company.
- B. CMU Substrates:
 - 1. Epoxy Coating System:
 - a. Prime Coat: Epoxy block filler.
 - 1) Super Spec Waterborne Latex Block Filler 160; Benjamin Moore & Co.
 - 2) TRU-GLAZE-WB[™] 4015 High Performance Waterborne Epoxy Block Filler; Glidden Professional.
 - 3) Pitt Glaze WB 16-90 Epoxy Block Filler; PPG Industries.
 - 4) Kem Cati-Coat HS Epoxy Filler/Sealer, B24W400/V400 S (high moisture areas), or S-W Loxon Block Surfacer, A24W200; Sherwin-Williams Company.
 - b. Intermediate Coat:
 - 1) Super Spec HP Acrylic Epoxy Semi-Gloss Catalyzed P43; Benjamin Moore & Co.
 - TRU-GLAZE-WB[™] 4426 Waterborne Epoxy Semi-Gloss Coating; Glidden Professional.
 - 3) Pitt Glaze WB 16-551 series Water Based Epoxy; PPG Industries.
 - 4) Water Based Catalyzed Epoxy Enamel B70; Sherwin-Williams Company.
 - c. Topcoat: Epoxy, cold-cured, gloss.
 - Super Spec HP Acrylic Epoxy Semi-Gloss Catalyzed P43; Benjamin Moore & Co.
 - TRU-GLAZE-WB[™] 4426 Waterborne Epoxy Semi-Gloss Coating; Glidden Professional.
 - 3) Pitt Glaze WB 16-551 series Water Based Epoxy; PPG Industries.
 - 4) Water Based Catalyzed Epoxy Enamel B70; Sherwin-Williams Company.

3.7 EXTERIOR HIGH-PERFORMANCE COATING SCHEDULE

- A. Exposed Structural Canopy Steel, Angle Lintels and Hung Plate Substrates:
 - 1. Basis-of-Design Polysiloxane Coating System:
 - a. Prime Coat: Two component, high solids, metallic rich epoxy primer.
 - b. Intermediate Coat: High-build epoxy marine coating, low gloss.

- c. Topcoat: Two component, high solids Polysiloxane coating Interfine 878 by International Paint LLC.
- 2. Polysiloxane System PPG Industries:
 - a. Prime Coat: PPG AQUAPON 97-670 series Organic Zinc Rich Primer.
 - b. Prime Coat: PPG Pittguard 97-946 series All-Weather DTR Epoxy Mastic.
 - c. Topcoat: PPG Amercoat PSX 1001 Series Single pack acrylic polysiloxane.
- 3. Other Available Products:
 - a. Glidden Professional (Devoe Coatings) Steel:
 - 1) Prime Coat: CATHA-COAT® 302H Reinforced Inorganic Zinc Primer.
 - 2) Intermediate Coat: BAR-RUST® 231 Multi-Purpose Epoxy.
 - 3) Topcoat: DEVTHANE® 379UVA Aliphatic Acrylic Urethane Gloss Enamel.
 - b. Glidden Professional (Dovoe Coatings) Galvanized Steel:
 - 1) Prime Coat: DEVRAN® 205 Universal Epoxy.
 - 2) Intermediate Coat: DEVTHANE® 379UVA Aliphatic Acrylic Urethane Gloss Enamel.
 - 3) Topcoat: DEVTHANE® 379UVA Aliphatic Acrylic Urethane Gloss Enamel.
 - c. Sherwin-Williams Company Steel:
 - 1) Prime Coat: S-W Zinc Clad IV Epoxy Primer B69 A8 Series.
 - 2) Intermediate Coat: S-W Acrolon 218HS B65W00611 Aliphatic Urethane Gloss Enamel.
 - 3) Topcoat: S-W Acrolon 218HS B65W00611 Aliphatic Urethane Gloss Enamel.
 - d. Sherwin-Williams Company Galvanized Steel:
 - 1) Prime Coat: S-W Recoatable Epoxy Primer B67A5 Series or, for high abrasion areas: DTM Wash Primer.
 - 2) Intermediate Coat: S-W Acrolon 218HS B65W00611 Aliphatic Urethane Gloss Enamel.
 - 3) Topcoat: S-W Acrolon 218HS B65W00611 Aliphatic Urethane Gloss Enamel.
 - e. PPG Industries, Inc.:
 - 1) Prime Coat: PPG Pittguard 97-946 series All-Weather DTR Epoxy Mastic.
 - 2) Intermediate Coat: PPG Pitthane Ultra 95-812 series Acrylic Aliphatic Urethane.
 - 3) Topcoat: PPG Pitthane Ultra 95-812 series Acrylic Aliphatic Urethane.
 - f. PPG Industries, Inc.:
 - 1) Prime Coat: PPG AQUAPON 97-670 series Organic Zinc Rich Primer.
 - 2) Intermediate Coat: PPG Pitthane Ultra 95-812 series Acrylic Aliphatic Urethane.
 - 3) Topcoat: PPG Pitthane Ultra 95-812 series Acrylic Aliphatic Urethane.
- B. Do not allow excessive time to elapse following application of epoxy type coatings, as determined by the manufacturer; document manufacturer's recommendation for the Architect's information.

END OF SECTION

SECTION 10 00 05 - MISCELLANEOUS SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes equipment and specialties not specified in other sections of the Project Manual.
- B. Furnish labor, materials, tools, equipment, services and supervision required to complete Work, including all incidental and complementary Work shown, specified or necessary to complete Work.
- C. Make all final connections for products included in this Section.
- D. Section includes:
 - 1. Floor Safe.
 - 2. Rain Barrels.
 - 3. Double Sided Display Cases.
 - 4. Poster Cases.
 - 5. Outdoor LED message display for site marquee.

1.2 SUBMITTALS

- A. Shop Drawings: Indicate locations, construction and anchorage details, dimensions and rough-in opening sizes.
- B. Product Data: Submit data for furnishings describing size, color and finish, details of function and attachment methods.
- C. LEED Submittals: Provide documentation for composite wood and laminating adhesives products indicating no added urea formaldehyde.
- D. Samples:
 - 1. When directed by the Architect, furnish samples showing full color range and other features of the product.
 - 2. Where applicable, furnish one of each type wall clip or anchoring device to install product to the building construction.
- E. Certify in writing that each product meets the specifications and can be installed in building where scheduled; certifications shall be produced and submitted following verification of site conditions.
- F. Submit operation and maintenance data for electrically operated equipment.
- 1.3 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section with minimum five years experience.

1.4 PROJECT CONDITIONS

- A. Verify measurements in field as required for Work fabricated to fit job conditions.
- B. Before ordering items or fabrication of Work, examine Drawings, job conditions, to assure good fit, neat installation.

PART 2 PRODUCTS

2.1 FLOOR SAFE

- A. Basis-of-Design: Gardall Model B2015.
- B. Outside Dimensions: 20 1/2 inches by 19 1/4 inches by 18 1/4 inches.

2.2 RAIN BARRELS

- A. Basis-of-Design: Woody Wall Tank by Exaco Trading Company; www.exaco.com.
- B. Capacity: 92 gallons.
- C. Size: 49 inches by 40 inches by 16 inches.
- D. Accessories:
 - 1. Universal Down Spout Connection Kit; size to fit down spout size.
 - 2. Brass spigot/faucet.
- E. Quantity: 2.

2.3 DOUBLE SIDED DISPLAY CASES

- A. Basis-of-Design: Model 900DC-DF Series Double Faced Display Case Complete: Mfg. by The Tablet & Ticket CO, West Chicago, IL. Distributed by Mountain View Specialties, LLC. email: info@mvsllc.net, Ph: 231 392 7996, Fx: 231 533 5860.
- B. Other Approved Manufacturers:
 - 1. Helmudt Guenschel, Baltimore MD
 - 2. Blumcraft, Baltimore, MD
 - 3. CL Laurence
 - 4. Claridge.
- C. Construction: Complete Double Faced Case, with Front heavy duty framed sliding glass tempered glass doors in aluminum tracking and fixed tempered glass back panel, completely assembled and wired with finished interior box. Top, sides, bottom, and back completely finish. Tempered glass adjustable shelves on hanging wire system and LED lights in top of unit. Units come totally assembled and wired. No knocked down units will be accepted.
 - 1. Usage: Type A-Interior
- D. Mounting: Type: Recess Mounted in wall
- E. Dimensions: 5'4"h x 6'0"w x 16" deep
- F. Doors: Type: Heavy Duty Aluminum Framed Sliding front, fixed tempered glass back.
- G. Glazing: Type 1/4" inch thick clear tempered sliding glass, in a heavy duty framed aluminum extrusion
- H. Finish: Clear satin anodized aluminum
- I. Lighting Type: LED Strip Light fixtures 120 volt
- J. Lighting Location: Hidden in the top of case by Diffusers
- K. Perimeter frame: 2" x 2" x ¼" aluminum with a clear anodized finish.
- L. Diffusers: White Parabolic
- M. Shelving: 3/8" tempered plate glass, front edge polished, sides swiped. 2 complete levels. On Adjustable Hanging wire system
- N. Depth of Shelving: 12".

- O. Edge work: All edges polished
- P. Box: Complete assembled ³/₄" plywood box with complete finished interior.
- Q. Locks: Ratchet for sliding glass doors.

2.4 POSTER CASES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Claridge Products & Equipment, Inc.
 - 2. Ghent Manufacturing Inc.
 - 3. Marsh Industries, Inc.
 - 4. Poblocki & Sons.
 - 5. PolyVision Corporation.
- B. General: Factory-fabricated unit consisting of manufacturer's standard cabinet with tack assembly on back inside surface and glazed doors at front.
- C. Aluminum-Framed Cabinet: Extruded aluminum; with clear anodic finish.
- D. Glazed Hinged Doors: 3/16 inch thick, tempered glass set in frame matching cabinet material and finish. Equip each door with full-height continuous hinge and cylinder lock with two keys.
 1. Number of Doors: As indicated on Drawings.
- E. Tack Surface: Vinyl-fabric-faced tack assembly.1. Color: As selected by Architect.
- F. Width: As indicated on Drawings.
- G. Height: As indicated on Drawings.
- H. Depth: As indicated on Drawings.
- I. Mounting Height: As indicated on Drawings.
- J. Mounting: Recessed.
- 2.5 OUTDOOR LED MESSAGE DISPLAY FOR SITE MARQUEE
 - A. Basis of Design: Street Smart 17 mm Series, Electronic Signs: or comparable fabrication of Stewart Signs or Visual Information Services.
 - B. Description:
 - 1. Display: 64 x 128 matrix, 10.5"/4 lines.
 - 2. Cabinet Size: 3'-8" x 7'-4"
 - 3. Case Material: Aluminum
 - 4. Pixel color: Red
 - 5. Viewable in direct sunlight.
 - 6. Controller software enabling programmable hold times, centering, calendar scheduling, and presentation styles.

PART 3 EXECUTION

- 3.1 INSTALLATION
 - A. Order items in ample time so as not to delay job progress with delivery at job site coordinated with other Work.
 - B. Install in a thorough, workmanlike manner, in strict accordance with manufacturer's printed instructions and subject to inspection by the Architect.

C. Assembly:

- 1. Deliver factory-built units completely assembled in one piece without joints, whenever possible.
- 2. Where dimensions exceed unit size, provide two or more pieces of equal length as acceptable to Architect and Owner.
- 3. When overall dimensions require delivery in separate units, prefit at factory, disassemble for delivery, and make final joints at site.
- 4. Use splines at joints to maintain surface alignment.
- D. Install units in locations and mounting heights as shown on Drawings, keeping perimeter lines straight, plumb and level.
- E. Provide all grounds, clips, backing materials, adhesives, brackets, anchors, trim and accessories for complete installation.
- F. Coordinate job-assembled units with grounds, trim and accessories; join all parts with neat, precision fit.
- G. Verify accessories required for each unit properly installed and operating units properly functioning.

3.2 CLEANUP

A. Remove temporary protective cover at completion.

END OF SECTION

SECTION 10 11 01 - VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Markerboards and Tackboards.
- B. Dry Erase Wallcovering.

1.2 REFERENCE STANDARDS

- A. ANSI A208.1 American National Standard for Particleboard; 2009.
- B. ASTM A424 Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.
- C. ASTM C208 Standard Specification for Cellulosic Fiber Insulation Board; 2008a.
- D. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on markerboard, tackboard, tackboard surface covering, trim, and accessories.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.1. Include dimensions indicating location of boards in relation to other items in the room.
- D. Samples: Submit color charts for selection of color and texture of markerboard, tackboard, tackboard surface covering, and trim.
- E. Test Reports: Show conformance to specified surface burning characteristics requirements.
- F. LEED Submittals: Product data indicating composite wood, agrifiber products and laminating adhesives have no added urea formaldehyde.
- G. Maintenance Data: Include data on regular cleaning, stain removal.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.5 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Provide life-of-the-building warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.
- C. Provide ten year warranty for tackboards to include repair or replacement of tackboards that fail in materials or workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Visual Display Boards:
 - 1. MooreCo, Inc: www.moorecoinc.com.
 - 2. Claridge Products and Equipment, Inc; Product LCS Markerboard Series 1 (Basis-of-Design): www.claridgeproducts.com.

3. Marsh Industries, Inc. : www.marsh-ind.com.

2.2 VISUAL DISPLAY BOARDS

- A. Markerboards: Porcelain enamel on steel, laminated to core.
 - 1. Metal Face Sheet Thickness: 0.024 inch (24 gage).
 - 2. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
 - 3. Backing: Aluminum sheet, laminated to core.
 - 4. Frame: Extruded aluminum, with concealed fasteners.
 - 5. Frame Profile: As indicated on drawings
 - 6. Frame Finish: Anodized, natural.
 - 7. Accessories: Provide chalk tray and map rail with map hooks.
 - a. Provide continuous chalk tray; match length of markerboard.
 - b. Box Type: Extruded aluminum with slanted front, grooved tray, and cast-aluminum end closures.
- B. Tackboards and Tackable Wall Covering: Composition cork.
 - 1. Linoleum Type:
 - a. Basis-of-Design: Forbo.
 - b. Natural materials consisting of linseed oil, granulated cork, resin binders and dry pigments, mixed and calendered onto a natural jute backing.
 - c. Color shall extend throughout total thickness of material.
 - d. Able to self-heal from thumbtack and pin punctures.
 - e. Does not dry, crack, peel or crumble.
 - f. Washable finish.
 - 2. Tackable Surface Thickness: 1/4 inch.
 - 3. Color: Minimum of nine color selections available for Architect selection; Architect reserves the right to select several colors throughout the Project which may be different for wall covering and tack boards.
 - 4. Backing: Fiberboard, 3/8 inch thick, laminated to tack surface.
 - 5. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
 - 6. Size: As indicated on drawings.
 - 7. Frame at Tackboards: Same type and finish as for markerboard.
 - a. Exception: Tackboards mounted on doors to be provided with solid wood frame coordinated with species of door.
 - b. Finish: Anodized, natural.
- C. Combination Units and Units Made of More Than One Panel: Factory-assembled markerboards and tackboards in a single frame, of materials specified above.
 - 1. Join panels of different construction with H-shaped extruded aluminum molding finished to match frame.
 - 2. Join panels of similar construction with butt joints, aligned and secured with steel spline concealed in edge of core.
 - 3. Configuration: As indicated on drawings.
 - 4. Units Too Large to Ship Assembled: Fully assembled in factory, then disassembled for shipping.

2.3 MATERIALS

A. Porcelain Enameled Steel Sheet: ASTM A424, Type I, Commercial Steel, with fired-on vitreous finish.

- B. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces. No added urea formaldehyde.
 - 1. Core for markerboards.
- C. Fiber Board: ASTM C208, cellulosic fiber board.1. Core for tackboards.
- D. Aluminum Sheet Backing: 0.015 inch thick.
- E. Adhesives: Type used by manufacturer. No added urea formaldehyde.
- 2.4 DRY ERASE WALLCOVERING
 - A. Basis-of-Design: Walltalkers just-rite.
 - 1. Material: Moderate gloss vinyl surface with woven backing for projection and dry erase markers.
 - 2. Accessories:
 - a. Adhesives: Heavy-duty clear or clay based premixed vinyl adhesive.
 - b. Substrate Primer/Sealer: White pigmented acrylic base primer/sealer specifically formulated for use with vinyl wallcoverings.
 - c. J-Cap Wall Covering Trim: Clear Satin, anodized aluminum trim at all sides and tops of wall covering in each location.
 - d. Adhesives, Primer/Sealer applied within the building interior: Comply with low-emitting requirements specified in Section 01 61 16.

2.5 ACCESSORIES

- A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall, full width of frame.
- B. Map Supports: Formed aluminum sliding hooks and roller brackets to fit map rail.1. Provide two map hooks for every 48 inches of map rail or fraction thereof.
- C. Flag Holders: Cast aluminum bored to receive 1 inch diameter flag staff, bracketed to fit top rail of board.
 - 1. Provide one standard flag holder at the front of each classroom.
- D. Chalk Tray: Aluminum, manufacturer's standard extruded profile one piece full length of chalkboard, molded ends; concealed fasteners, same finish as frame.
- E. Mounting Brackets: Concealed.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that field measurements are as indicated.
 - B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.
- 3.2 INSTALLATION
 - A. Install boards in accordance with manufacturer's instructions.
 - B. Secure units level and plumb.
 - C. Butt Joints: Install with tight hairline joints.

3.3 INSTALLATION (WALLCOVERING)

- A. Confirm drywall has been brought to a level 4 finish.
- B. Wallcovering Backing:
 - 1. Acclimate wallcovering in the area of installation a minimum of 24 hours before installation.
 - 2. Read and follow the manufacturer's installation instruction sheet contained in each roll of the dry erase wallcovering.
 - 3. Examine all materials for pattern, color, quantity and quality, as specified for the correct location prior to cutting.
 - 4. Primer: Use a quality pigmented acrylic wallcovering primer.
 - 5. Adhesive: Apply a uniform coat of heavy-duty pre-mixed clay-based or extra strength clear wallcovering adhesive.
 - 6. Install each strip horizontally and in the same sequence as cut from the roll.
 - 7. Install dry erase wallcovering sheets in exact order as they are cut from bolt. Reverse hang alternate strips (except lined products). Do not crease or bend the wallcovering when handling.
 - 8. Install dry erase wallcovering horizontally using a level line.
 - 9. Using a level or straight edge, double cut the seam with a seam-cutting tool. Do not score drywall or plasterboard when cutting material.
 - 10. When covering the entire wall, seam the material out of the main writing and viewing areas of the wall.
 - 11. Apply wallcovering to the substrate using a wallcovering smoother, wrapped with a soft cloth, to remove air bubbles. Do not use sharp edged smoothing tools. Smooth material on the wall from the middle to the outside edge.
 - 12. Remove excess adhesive immediately after the wallcovering is applied. Clean entire surface with a warm mild soap solution, and clean soft cloths. Rinse thoroughly with water and let dry before using. Change water often to maintain water clarity.
 - 13. Stop installation of material that is questionable in appearance and notify the manufacturer's representative for an inspection.
- C. Self-adhesive Backing:
 - 1. Acclimate wallcovering in the area of installation a minimum of twenty-four hours before installation.
 - 2. Examine all materials for color, quantity, and quality as specified for the correct location prior to cutting.
 - 3. Read and follow the instructions in the manufacturer's installation sheet contained in each roll of the dry erase wallcovering.
 - 4. Do not crease or bend the wallcovering when handling.
 - 5. To allow air bubble removal, use a pump spray bottle to dampen the surface to be covered.
 - 6. Dampening solution = one half to one capful of mild detergent to 1 gallon (1.81kg) clean water.
 - 7. Slowly remove release liner and smooth wall covering to the hanging surface using a wallcovering smoother wrapped with a soft cloth from the middle to the outside edge to remove air bubbles.
 - 8. Stop installation of material that is questionable in appearance and notify the manufacturer's representative for an inspection.

3.4 CLEANING

A. Clean board surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 10 14 00 - SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Room and door signs.
- B. Plaques.
- C. Dimensional characters.
- D. Exterior Educational Signs.

1.2 DESIGN REQUIREMENTS - INTERIOR SIGNS

- A. Permanent Rooms and Spaces:
 - 1. Provide signs identifying each room at each door (interior and exterior).
 - 2. Provide No Smoking signs as indicated on the drawings.
 - 3. Type Styles:
 - a. Must be upper case and sans serif.
 - b. Must have a width to height ratio of between 3:5 and 1:1.
 - c. Must have a stroke width to height ratio of between 1:5 and 1:10.
 - 4. Tactile and Braille Characters: Characters raised a minimum of 1/32 inch and accompanied by Grade 2 braille.
 - 5. Character Height: Tactile characters must be between 5/8 inch and 2 inches in height.
 - 6. Pictograms (Symbols), if specified:
 - a. Minimum of a 6 inch high field or background; must be supplemented by upper case tactile descriptive verbiage and Grade 2 braille below pictogram.
 - b. No other graphic can invade the pictogram field.
 - c. Pictogram itself is not required to be tactile.
 - d. Provide pictogram and descriptive verbiage accompanied by Grade 2 braille at locations required.
 - 7. Finish and Contrast:
 - a. Matte (non-glare) characters and background; minimum contrast of 70 percent.
 - b. Light characters on dark background or dark characters on light background are acceptable.
 - 8. Mounting Conditions:
 - a. Mount 60 inches from finish floor to baseline of highest tactile letter on latch side of door.
 - b. Where no wall space is provided at the latch side of the door, place on nearest adjacent wall so that a person can approach to within 3 inches of signage without protrusions or swing of door.
- B. Direction and Informational:
 - 1. Type Styles:
 - a. May be upper and lower case and sans serif.
 - b. Shall have a width to height ratio of between 3:5 and 1:1.
 - c. Shall have a stroke width to height ratio of between 1:5 and 1:10.
 - 2. Tactile and Braille Characters: Not required for Type 2 signage.
 - 3. Character Height: Characters shall be sized on viewing distance.
 - 4. Pictograms (Symbols), if specified:
 - a. No tactile requirement.
 - b. Provide pictogram at locations designated in Signage Schedule and Drawings.

- 5. Finish and Contrast:
 - a. Matte (non-glare) characters and background; minimum contrast of 70 percent.
 - b. Light characters on dark background or dark characters on light background are acceptable.
- 6. Mounting Conditions:
 - a. Mount 60 inches from finish floor to baseline of highest tactile letter on latch side of door.
 - b. Where no wall space is provided at the latch side of the door, place on nearest adjacent wall so that person can approach to within 3 inches of signage without protrusions or swing of door.
- C. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, sign types, lettering font, tactile designations, foreground and background colors, locations, overall dimensions of each sign and method of attachment.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule along with the room number that will appear on the sign.
- D. Samples: Submit one sample of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips of the manufacturers full range of colors.
- F. LEED Submittal: Provide documentation of VOC content in g/L for adhesives applied within the building waterproofing envelope.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled in name groups.
- C. Store tape adhesive at normal room temperature.

PART 2 PRODUCTS

2.1 SIGNAGE FABRICATION

- A. Available Manufacturers:
 - 1. Best Sign Systems, Inc: www.bestsigns.com.
 - 2. Mohawk Sign Systems, Inc: www.mohawksign.com.
 - 3. Bayuk Graphic Systems, Inc., Parkesburg, Pennsylvania.
 - 4. Digital Color Graphics, Pittsburgh, Pennsylvania.
 - 5. Supersine Company.
- B. The following two methods will be accepted by the Architect.
- C. Method 1:

- 1. Plaque assembly to be plastic laminate construction; plastic laminate to be impervious to most acids, alkalies, alcohol, solvents, abrasives and boiling water; plastic laminate to be non-static, fire-retardant, and self extinguishing.
- 2. Approximately 0.080-inch thick non-glare matte acrylic face laminated to approximately 0.080-inch thick acrylic back plate with filler to create windows for inserts, if so indicated.
- 3. Non-tactile graphics to be subsurface or second surface applied signs; surface-applied graphics are not acceptable.
- 4. Painted surfaces will not be accepted.
- 5. Polycarbonate (0.03 inch thick) window inserts, if applicable; painted subsurface to match sign.
- 6. Tactile Copy Material (where designated): Individual plastic letters or characters of one solid color and chemically bonded by the use of a high strength solvent within a matched routed depression in sign face to create graphics which are raised a minimum of 1/32 inch from the face of sign; tactile characters 5/8 inch to 2 inches in height as required by Architect.
- 7. Braille (if applicable): Grade 2 braille engraved into face of sign.
- 8. Mechanically fasten plaque assembly to wall by use of a backplate, which will be secured to the outer assembly.
- 9. Corners as indicated; sides can be beveled or flat.
- 10. Colors to be selected by Architect, which include custom fabrications based on manufacturer's capabilities.
- D. Method 2:
 - 1. Plaque assembly to be plastic laminate construction; plastic laminate to be impervious to most acids, alkalies, alcohol, solvents, abrasives and boiling water; plastic laminate to be non-static, fire-retardant, and self extinguishing.
 - 2. Approximately 0.080-inch thick non-glare matte acrylic face laminated to approximately 0.080-inch thick acrylic back plate with filler to create windows for inserts, if so indicated.
 - 3. Non-tactile graphics to be subsurface or second surface applied on signs; surface-applied graphics are not acceptable.
 - 4. Painted surfaces will not be accepted.
 - 5. Polycarbonate (0.03 inch thick) window inserts, if applicable; painted subsurface to match sign.
 - 6. Tactile Copy (where designated): Produced by blasting the laminate assembly removing the background material, and raising the characters and braille; the characters and braille are part of the original outer laminate color and do not require painting.
 - 7. Braille (if applicable): Grade 2 braille engraved into face of sign.
 - 8. Mechanically fasten plaque assembly to wall by use of a backplate that will be secured to the outer assembly.
 - 9. Corners as indicated; sides can be beveled or flat.
 - 10. Colors to be selected by Architect, which can include custom fabrication based on manufacturer's capabilities.

2.2 DIMENSIONAL CHARACTERS

- A. Available Manufacturers:
 - 1. A. R. K. Ramos.
 - 2. Gemini Incorporated.

- 3. Matthews International Corporation; Bronze Division..
- 4. Metal Arts; Div. of L&H Mfg. Co.
- 5. Nelson-Harkins Industries.
- B. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.
- C. Cast Characters: Produce characters with smooth flat faces, sharp corners, and precisely formed lines and profiles, free of pits, scale, sand holes, and other defects. Cast lugs into back of characters and tap to receive threaded mounting studs. Alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated. Comply with the following requirements.
 - 1. Character Material: Aluminum.
 - 2. Mounting:
 - a. Typical: Concealed stud; projected 1 inch from wall with aluminum tube spacers.
 - 3. Letter and Number Heights: Provide sizes indicated on Drawings.
 - 4. Font: Helvetica Medium.
 - 5. Color: Match Architect's sample.
 - 6. Finish:
 - a. Typical Interior and Exterior: Powder coat.
- 2.3 PLAQUES
 - A. Available Plaque Manufacturers:
 - 1. A. R. K. Ramos.
 - 2. Gemini Incorporated.
 - 3. Matthews International Corporation; Bronze Division..
 - 4. Metal Arts; Div. of L&H Mfg. Co.
 - 5. Nelson-Harkins Industries.
 - B. Bronze Castings: ASTM B 584, Alloy UNS No. C86500 (No. 1 manganese bronze).
 - C. Cast Plaque: Provide castings free of pits, scale, sand holes, and other defects, as follows:
 - 1. Plaque Material: Bronze.
 - 2. Background Texture: Manufacturer's standard pebble or leatherette texture.
 - 3. Border Style: Projected bevel.
 - 4. Mounting: Concealed studs, noncorroding for substrates encountered.
 - D. Cast-Bronze Plaque Finishes: Exposed surfaces free of porosity, burrs, and rough spots; with returns finished with fine-grain air blast.
 - 1. Raised Areas: Hand-tool and buff borders and raised copy to produce manufacturer's standard satin finish.
 - 2. Background Finish: Dark oxidized.
 - 3. Clear Protective Coating: Coat exposed surfaces of copper alloys with manufacturer's standard, clear organic coating specially designed for coating copper-alloy products.
 - E. Plaque Schedule: As indicated on drawings, minimum of three.
 - 1. State Plaque: See attached requirements.
 - 2. Other Plaques Refer to drawings and the following:
 - a. Plaque Size: 18 inches wide by 12 inches high.
 - b. Text Style: As selected by Architect from manufacturer's standards.
 - c. Text: Will be provided by Architect.
 - d. Location: As indicated.

2.4 EXTERIOR EDUCATIONAL SIGNS

- A. Basis-of-Design: Takeform, Signify.
- B. Sign Standards:
 - 1. Provide exterior signage in accordance with Architects's drawings and specifications. Sign locaiton and sign message schedule shall be as provided by Architect.
 - 2. It is the intent of these specifications to establish an exterior sign standard for the Owner including primary identity, secondary identity, wayfinding and DOT signage. The signage contractor shall design and submit approval drawings for all required signage.
- C. Description:
 - 1. Signs shall be welded aluminum frame construction, with one-piece, seamless RCM grapahic panels. Graphic panels shall be removable and updateable. Refer to drawings for sizes, sign types, colors, finish, copy, lay-out, letter-style, single or double-sided, and mounting requirements.
 - 2. Typography:
 - a. Letter Style: Refer to drawings. Copy shall be a true, clean and accurate representation of typeface(s) specified. Upper and lower case or all caps as indicated on drawings. Letter spacing to be normal and interline spacing shall be set by manufacturer.
 - b. Arrows, symbols and logo art: To be provided in style, sizes, colors and spacing as indicated on the drawings.
 - c. Letters and symbols are to be backlit.
 - 3. Sign Types, Colors and Finishes:
 - a. Sign types and sizes: Refer to drawings.
 - b. Colors and finishes: Refer to drawings.
 - c. Lay-out and typography: Refer to drawings.
 - d. Mounting details: Refer to drawings.
- D. Materials and Construction:
 - 1. All signs, primary identity, secondary identity, wayfinding and DOT signage shall have a matching appearance and constructed utilizing the same materials and manufacturing process to assure a consistent look throughout.
 - 2. Signs shall be welded all-aluminum frame construction. Signs utilizing steel components shall not be accepted. Cabinet face shall be reinforced with concealed stiffeners to preclude buckling, distortion or oil-canning. Posts shall be aluminum 6063 grade, square with no corner radii. Wall thickness of the posts shall be .125 inches.
 - 3. Sign faces shall be seamless, one piece RCM graphic panels. Face shall be .25 inch minimum thickness. Painted aluminum or fiberglass panels shall not be accpted. The panels shall be a flat, thermoset resin homogeniously reinforced, comprised of 70 percent wood based fibers. The panels shall be resistant to moisture and rapid fluctuations in temperature.
 - 4. Colors, and gneeral appearance shall be unaffected by sun and acid rain for 10 years from installation. Both the UV resistance and color stability shall comply with the highest score classification 4-5 measured with the grey scale according to ISO 105 A02.
 - 5. The panels shall be impact resistant and vandal-proof. The panels shall have a closed pore-free surface ensuring minimal dirt accumulation. The panels shall be vandal resistant enabling marks and graffiti to be removed utilizing strong cleaning solvents. Normal cleaning shall be accomplished utilizing standard non-abrasive cleaners.

- 6. Welded connections shall comply with AWS standards for recommended practices. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
- 7. All surfaces, including edges, shall be finished without scratches, dents, ripples or other imperfections.
- 8. Signage cabinet shall have removable panels on the sign face to facilitate copy changes and for ease of access to internal lighting. The quantity of removable panels per sign face shall be indicated on the drawings.
- 9. The sign face shall have no exposed fasteners. No rivets, screws or fasteners shall be visible on face.
- 10. Illuminated signs shall utilize 120 VAC standard T12 fluorescent bulbs and shall be spaced to assure a consistent and even distribution of light without "hot or cold spots".
- 11. Sins shall be preassembled at the factory with no or minimal reassembly at the project site.
- 12. Signs shall be installed by the direct bury method with a minimum embedment of 36 inches. Electrical location and hardwire connection shall be provided by Contractor. All signs shall be provided with appropriate mounting hardware. All exposed hardware shall be stainless steel.
- E. Finishing:
 - 1. Signs shall utilize Akzo Nobel Grip-Guard Basecoat/Clearcoat paint system or approved equal: paint finish shall consist of an etching primer applied to a sanded surface as a first coat, followed by the color coat and lastly, a protective clear coat that provides scratch resistance, abrasion resistance, weather resistance and UV inhibitors.
 - 2. Face/Background color shall be selected by Architect, be a standard grade, and shall match manufacturer's standard color selection, all colors and finishes.
 - 3. Paint: PMS colors as specified are to be matched according to the numbers specified from the PANTONE Color Selector 1000/Coated (or approved equal).
- F. Construction:
 - 1. Design exterior signs to withstand wind loads as caculated in accordance with applicable building code:
 - a. Design wind load: as required by municipal code.
 - b. Safety factor: 1.5 times design wind load.
 - 2. Frame and Enclosure:
 - a. Design, construct, and install structural and non-structural support framing in conformance with applicable building code and ANSI Standards.
 - b. Design to allow for thermal movements of components resulting from a maximum change (range) of 120 deg F in ambient temperature and 180 deg F in surface temperatures without buckling, opening of joints, overstressing components, or failure of connections.
 - c. Seismic Loads: design and size components to withstand seismic loads and sway displacement per applicable building code.
 - 3. Sign faces to be impact resistant, and produce no noticeable color change for 10 years.

2.5 ACCESSORIES

- A. Exposed Screws: Chrome plated; tamper-proof.
- B. Adhesive: Double sided tape, permanent adhesive. Adhesives applied within the building interior: VOC content not to exceed 70g/L.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions after surfaces are finished.
- B. Install neatly, with horizontal edges level, plumb and true, and in correct relation to adjoining Work.
- C. Locate signs where indicated:
 - 1. If no location is indicated obtain Owner's instructions.
- D. Protect from damage until Substantial Completion; repair or replace damage items.
- E. Dimensional Characters: Mount characters using standard fastening methods to comply with manufacturer's written instructions for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
- F. Cast-Metal Plaque: Mount plaque using standard fastening methods to comply with manufacturer's written instructions for type of wall surface indicated.
 - 1. Concealed Mounting: Mount plaque by inserting threaded studs into tapped lugs on back of plaque. Set in predrilled holes filled with quick-setting cement.

3.3 CLEANING

A. Wash surfaces following installation.

END OF SECTION

APPENDIX E SCHOOL PLAQUE

School plaque for State funded school construction projects (12" X 18")

STATE FUNDS FOR THE (select appropriate option) THIS SCHOOL BUILDING WERE PROVIDED THROUGH THE PUBLIC SCHOOL CONSTRUCTION PROGRAM (DATE) BOARD OF PUBLIC WORKS LARRY HOGAN, GOVERNOR PETER FRANCHOT, COMPTROLLER NANCY K. KOPP, TREASURER

options to be selected and inserted:

- "... CONSTRUCTION OF ..."
- "... CONSTRUCTION OF AN ADDITION TO ..."
- "... RENOVATION OF ..."
- "... CONSTRUCTION OF AN ADDITION AND RENOVATIONS TO ..."
SECTION 10 14 53 – TRAFFIC SIGNAGE

PART 1 GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Requirements of the General Provisions apply to all work under this section.
 - B. General Conditions of the Baltimore County Board of Education's Specifications for Site Development.
 - C. Baltimore County Department of Public Works Standard Details for Construction dated 2007 and as amended.
 - D. Maryland Manual of Uniform Traffic Control Devices(MUTCD) for Streets and Highways dated 2011 and as amended.
 - E. Baltimore County Sign Installation and Procedures Manual, current version
 - F. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Architect for consideration. Those judged to be equal to that specified will receive written approval.

1.2 SUMMARY

- A. Furnish all labor, materials, equipment and services necessary for and reasonably incidental to complete the site signs work as indicated on drawings or specified, including but not limited to the following:
 - 1. Exterior Parking Signs
 - 2. Exterior Traffic Control Signs.

1.3 QUALITY ASSURANCE

- A. Uniformity of Manufacturer: For each sign form and graphic image process indicated, furnish products of a single manufacturer.
- B. All signage to comply with applicable A.D.A. requirements.
- C. All signage to comply with applicable MUTCD requirements.
- D. All signage to comply with applicable Baltimore County requirements.
- E. All signage installation to comply with current Baltimore County Sign Installation and procedures Manual.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of sign required.
- B. Samples: Submit samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacture and design of each sign component, including graphics.
 - 1. Submit full-size sample units, if requested by Architect. Acceptable units may be installed as part of the work.
- C. Shop Drawings: Submit shop drawings for fabrications and erection of specialty signs. Include plans, elevations and large scale details of sign wording and lettering layout. Show anchorages and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Andco Industries Corp.
- B. A.C. Davenport & Son Co.
- C. A.S.I. Sign Systems
- D. Spanjer Brothers, Inc.
- E. The Supersine Company
- F. Southwell Company
- 2.2 GENERAL REQUIREMENTS
 - A. All letters shall be Helvetica Medium; upper case.
 - B. Letters shall be centered on signs.
 - C. Panel backgrounds shall be colored from manufacturer's standards with matte finish.

2.3 MATERIALS

- A. Aluminum Casting: Alloy and temper recommended by aluminum producer or finisher for typed of use and finish indicated and with not less than the strength and durability properties specified in ASTM B 221 for 6063 TS
- 2.4 EXTERIOR PARKING SIGNS
 - A. Type: Silk screened letters and symbol on 0.125" dark blue baked enamel color aluminum message panel, supported on 2" square steel post set in concrete footing.

2.5 EXTERIOR TRAFFIC CONTROL SIGNS

A. All signs shall be in accordance with the Maryland "Manual on Uniform Traffic Control Devices for Streets and Highways", dated 2011 and as amended.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install sign units and components at locations indicated on the drawings securely mounted with concealed theft resistant fasteners, unless otherwise indicated. Attach signs to substrates in accordance with manufacturer's instructions.
- B. Install sign units level, plumb and at proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair and replace damaged units as directed by Architect.
- C. Installation of Exterior Parking and Traffic Control Signs:
 - 1. Erect sign plumb with top as indicated on the drawings.
 - 2. Anchor to concrete footing with concealed anchors in accordance with manufacturer's recommendations.

3.2 CLEANING AND PROTECTION

A. At completion of installation, clean soiled sign surface in accordance with manufacturer's instructions. Protect units from damage until acceptance by Owner.

SECTION 10 21 13.19 - PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid plastic toilet compartments.
- B. Urinal screens.

1.2 REFERENCE STANDARDS

A. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories.
- D. Test Reports: Indicating compliance with NFPA 286.
- E. Samples: Submit two samples of partition panels, 12 x 12 inch in size illustrating panel finish, color, and sheen.
- F. LEED Report: Accurately document the use of recycled materials and local/regional materials, as required by Section 01 81 13, Section 01 35 15, Section 01 35 16 and appropriate forms, and Section 01 60 00.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Comtec or Santana products by Scranton Products .
- B. Bradley Corporation.
- C. Hadrian.

2.2 COMPONENTS

- A. Toilet Compartments: Solid molded high density polyethylene (HDPE) plastic panels, doors, and pilasters, floor-mounted unbraced.
 - 1. Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.
 - 2. Recycled Content: provide 100 percent recycled content HDPE.
 - 3. Color: To be selected from manufacturer's entire range of HDPE products.
- B. Door and Panel Dimensions:
 - 1. Thickness: 1 inch.
 - 2. Door Width: 24 inch.
 - 3. Door Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Height: Manufacturer's standard not less than 55 inch.
 - 5. Thickness of Pilasters: 1 inch.
- C. Urinal Screens: Wall mounted with continuous panel brackets and pilaster anchored to floor.
 - 1. Maximum dimension from finished floor to bottom of urinal screen: 12 inches.

- 2. Minimum dimension from finished floor to top of urinal screen: 60 inches.
- 3. Minimum depth of urinal screen to be 18 inches; or from finished wall to a minimum of 6 inches beyond the outermost front lip of the urinal, whichever is greater.

2.3 ACCESSORIES

- A. Pilaster Shoes: Formed chromed steel with polished finish, 3 in high, concealing floor fastenings.
 - 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Hollow anodized aluminum tube, 1 x 1-5/8 inch size, with anti-grip strips and cast socket wall brackets.
- C. Pilaster Brackets: Chrome-plated, nonferrous, cast zinc alloy (zamac) or clear anodized aluminum.
- D. Wall Brackets: Continuous type, satin stainless steel or extruded aluminum.
- E. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
 - 2. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.
- F. Hardware: Polished stainless steel:
 - 1. Continuous hinges self-closing; stainless steel.
 - 2. Door Latch: Slide type with exterior emergency access feature.
 - a. Accessible stall door to be equipped with a slide latch that does not require gripping or twisting and shall be slotted to permit emergency access
 - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 4. Coat hook with rubber bumper; one per compartment, mounted on door.
 - 5. Provide door pull for outswinging doors.
 - a. Provide two door pulls (one each side) at accessible compartments to comply with ADA requirements.
- G. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum strip fastened to exposed bottom edges of solid-polymer doors and partitions.
- H. Provide wall stop at out-swinging doors where applicable.

2.4 FABRICATION

- A. Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions.
- B. Make provisions for setting and securing continuous head rail at top of each pilaster.
- C. Provide shoes at pilasters to conceal supports and leveling mechanism.

PART 3 EXECUTION

- 3.1 INSTALLATION
 - A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
 - B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
 - C. Attach panel brackets securely to walls using anchor devices.
 - D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.2 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.3 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.
- D. Adjust latching hardware for proper operation.

SECTION 10 21 23 - CUBICLES CURTAINS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface mounted overhead metal curtain track and guides.
- B. Curtains.

1.2 REFERENCE STANDARDS

A. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; National Fire Protection Association; 2010.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for curtain fabric characteristics and track system, including carriers.
- C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.
- D. Samples: Submit 12 x 12 inch sample patch of curtain cloth with representative hem stitch detail, heading with reinforcement, and carrier attachment to curtain header.
- E. Samples: Submit 12 inch sample length of curtain track including typical splice and mounting.
- F. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Accept curtain materials on site and inspect for damage.
- B. Store, handle, protect and install absorptive materials, including fabrics materials, in accordance with the Construction IAQ Management Plan required by Division 1 Specifications.
- C. Store curtain materials on site and deliver to Owner for installation when requested.

1.5 EXTRA MATERIALS

- A. See Section 01 60 00 Product Requirements, for additional provisions.
- B. Provide two of each curtain size.
- C. Provide ten extra carriers.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Cubicle Track and Curtains:
 - 1. A. R. Nelson Co: www.arnelson.com.
 - 2. C/S General Cubicle: www.c-sgroup.com/cubicle-track-curtains.
 - 3. Imperial Fastener Co., Inc: www.imperialfastener.com.

2.2 TRACKS AND TRACK COMPONENTS

A. Track: Extruded aluminum sections; one piece per cubicle track run; channel profile.

- 1. Structural Performance: Capable of supporting vertical test load of 50 lbs without visible deflection of track or damage to supports, safely supporting moving loads, and sufficiently rigid to resist visible deflection and without permanent set.
- 2. Track End Stop: To fit track section.
- 3. Track Bends: Minimum 18 inch radius; fabricated without deformation of track section or impeding movement of carriers.
- 4. Finish on Exposed Surfaces: White enamel finish.
- B. Curtain Carriers: Nylon roller to accurately fit track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal; one carrier for each 6 inches of fabric width.

2.3 CURTAINS

- A. All Curtain Materials:
 - 1. Naturally flame resistant or flameproofed; capable of passing NFPA 701 test.
- B. Curtain: Close weave polyester; anti-bacterial, self deodorizing, sanitized, and preshrunk.
- C. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, same color as curtain.
- D. Curtain Fabrication:
 - 1. Manufacture curtains of one piece, sized 10 percent wider than track length. Terminate curtain 12 inches from floor.
 - 2. Include open mesh cloth at top 24 inches of curtain for room air circulation.
 - 3. Curtain Heading: Triple thickness not less than 1 inch and not more than 1-1/2 inches wide, with metal grommet holes for carriers 6 inches on center, double fold bottom hem not less than 1 inch and not more than 1-1/2 inches wide with lead weights included. Lock stitch seams in two rows. Turn seam edges and lock stitch.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and supports above ceiling are ready to receive work of this Section.
- B. Verify that field measurements are as indicated.

3.2 INSTALLATION

- A. Install curtain track to be secure, rigid, and true to ceiling line.
- B. Install end cap and stop device.
- C. Install curtains on carriers ensuring smooth operation.

SECTION 10 22 13 - WIRE MESH PARTITIONS

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following items fabricated from wire mesh:
 - 1. Storage Room Partitions.
- B. Related Sections include the following:
 - 1. Division 8 Section "Door Hardware" for lock cylinders and keying for wire mesh partition doors.

1.2 **DEFINITIONS**

- A. Terms below shall be as defined in ASTM E 2016:
 - 1. Intermediate Crimp: Wires pass over one and under the next adjacent wire in both directions, with wires crimped before weaving and with extra crimps between the intersections.
 - 2. Lock Crimp: Deep crimps at points of intersection that lock wires securely in place.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance of Wire Mesh Railing Insert Panels: Capable of withstanding a horizontally applied normal load of 50 lbf on an area not to exceed 1 sq. ft. at any point without exceeding allowable design working stresses of materials for railings, anchors, and connections.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wire mesh items.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Maintenance Data: For wire mesh partition door hardware to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
 - 1. Installer's responsibilities include fabricating and installing wire mesh items and providing professional engineering services needed to assume engineering responsibility.
 - 2. Engineering Responsibility: Preparation of data for wire mesh items, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Source Limitations: Obtain wire mesh items through one source from a single manufacturer.
- C. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."
 - 2. AWS D1.3, "Structural Welding Code--Sheet Steel."
- D. 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. Deliver wire mesh items with cardboard protectors on perimeters of panels and doors and with posts wrapped to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Inventory wire mesh partition door hardware on receipt and provide secure lockup for wire mesh partition door hardware delivered to Project site.
 - 1. Tag each item or package separately with identification and include basic installation instructions with each item or package.
- C. Deliver keys to Owner by registered mail or overnight package service.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of construction contiguous with wire mesh items by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 COORDINATION

A. Coordinate installation of anchorages for wire mesh items supported or anchored to permanent construction. 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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Acorn Wire & Iron Works, Inc.
 - 2. G-S Company (The).
 - 3. Indiana Wire Products, Inc.
 - 4. Jesco Industries, Inc.
 - 5. King Wire Partitions, Inc.
 - 6. Wire Crafters, Inc.

2.2 MATERIALS

- A. Steel Wire: ASTM A 510.
- B. Steel Plates, Channels, Angles, and Bars: ASTM A 36/A 36M.
- C. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- D. Square Steel Tubing: Cold-formed structural-steel tubing, ASTM A 500.
- E. Panel-to-Panel Fasteners: Manufacturer's standard steel bolts.
- F. Postinstalled Expansion Anchors in Concrete: 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. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition (mild).
 - 2. For Postinstalled Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.

3. For Postinstalled Anchors in Grouted Masonry Units: Capability to sustain, without failure, a load equal to six times the loads imposed.

2.3 PAINT

A. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

2.4 WIRE MESH PARTITIONS

- A. Standard-Duty Mesh Partitions:
 - 1. Square Mesh: 0.135-inch- diameter, intermediate-crimp steel wire woven into 1-1/2-inch square pattern, inserted through frame holes and welded into frame. Vertical wires are plumb, and horizontal wires are perpendicular to vertical wires.
 - 2. Vertical Panel Framing: 1-1/4-by-5/8-by-0.0966-inch cold-rolled, C-shaped steel channels; with 1/4-inch- diameter bolt holes spaced not more than 18 inches o.c. along center of framing.
 - 3. Horizontal Panel Framing: 1-by-1/2-by-1/8-inch cold-rolled steel channels.
 - 4. Horizontal Panel Stiffeners: 1-by-1/2-by-1/8-inch cold-rolled steel channels with wire woven through, or two 1-by-1/2-by-1/8-inch cold-rolled steel channels bolted or riveted toe to toe through mesh.
- B. Swinging Doors: Fabricated from same mesh as partitions, with framing fabricated from 1-1/2-by-3/4-by-1/8-inch steel channels, banded with 1-1/2-by-1/8-inch flat steel bar cover plates on 3 sides, and with 1/8-inch- thick angle strike bar and cover on strike jamb.
 - 1. Hinges: Full-surface spring type, 3-1/2-by-3-1/2-inch steel, 1-1/2 pairs per door; bolted, riveted, or welded to door and jamb framing.
 - 2. Exit Device: As specified in Division 8 Section "Door Hardware."
 - 3. Tamper Shield: Fabricated from 0.0966-inch- thick, cold-rolled steel sheet; 15 inches high by width of door.
- C. Door Jamb Framing: 2-by-2-by-1/8-inch steel pipe or tubing.
- D. Floor Shoes: Steel, cast iron, or cast aluminum, 2 inches high; sized to suit vertical framing, drilled for attachment to floor, and with set screws for leveling adjustment.
- E. Wall Clips: Manufacturer's standard, cold-rolled steel sheet; allowing up to 1 inch of adjustment.
- F. Finishes for Interior Locations: Powder-coated finish.
 - 1. Color: As selected by Architect from manufacturer's full range.

2.5 FABRICATION

- A. General: Fabricate wire mesh items from components of sizes not less than those indicated. Use larger-size components as recommended by wire mesh item manufacturer. Provide bolts, hardware, and accessories as required for complete installation.
 - 1. Fabricate wire mesh items to be readily disassembled.
 - 2. Welding: Weld corner joints of framing and remove spatter.
- B. Wire Mesh Partitions: Provide door jamb framing on each side of doors. Attach tamper shields centered behind exit devices.

2.6 FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Finish wire mesh items after assembly.
 - 2. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Preparation for Shop Priming Nongalvanized Surfaces: Prepare nongalvanized surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed wire mesh items:
 1. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
- C. Shop Priming: Apply shop primer to uncoated surfaces of wire mesh items, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.
- D. Shop Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard one-coat, shop-coat finish. Comply with paint manufacturer's written instructions for applying and curing.
- E. Powder-Coated Finish: Apply manufacturer's standard baked finish, complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

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 work.
- B. Examine floors for suitable conditions where wire mesh items will be installed.
- C. Examine walls to which wire mesh items will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Wire Mesh Partitions:
 - 1. Anchor wire mesh partitions to floor with 3/8-inch- diameter, postinstalled expansion anchors at 12 inches o.c. through floor shoes located at each post. Adjust wire mesh partition posts in floor shoes to achieve level and plumb installation.
 - 2. Anchor angle clips supporting wire mesh partitions with 3/8-inch- diameter, postinstalled expansion anchors at 12 inches o.c. Weld partition framing to angle clips.
 - 3. Install doors complete with door hardware.

3.3 ADJUSTING AND CLEANING

A. Adjust doors to operate easily without binding.

- B. Check and readjust operating hardware items just before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work including doors and framing that are warped, bowed, or otherwise unacceptable.
- C. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint; paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

SECTION 10 22 26.33 - FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Acoustic operable panel partition (manual and electric).
- B. Ceiling track, ceiling guards, and operating hardware.
- C. Electric operator.
- 1.2 RELATED REQUIREMENTS
 - A. Section 05 50 00 Metal Fabrications: Overhead track structural support framing.
 - B. Section 07 90 05 Joint Sealers: Acoustical sealant.

1.3 REFERENCE STANDARDS

- A. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- B. ASTM E413 Classification for Rating Sound Insulation; 2010.
- C. ASTM E557 Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions; 2012.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on partition materials, operation, and hardware and accessories.
- C. LEED Report: Submit documentation for use of recycled materials, as required by Division 01 LEED sections and appropriate forms, and Section 01300.
- D. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, location and details of pass door and frame, and stacking depth.
- E. Samples for Selection: Submit two samples of full manufacturer's color range for selection of colors.
- F. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - 1. Suspended ceiling components.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Size and location of initial access modules for acoustical tile.
 - 4. Items penetrating finished ceiling, including the following:
 - a. Lighting fixtures.
 - b. HVAC ductwork, outlets, and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Smoke detectors.
 - f. Access panels.
 - 5. Plenum fire and acoustical barriers.
- G. Certificates: Certify that partition system meets or exceeds specified acoustic requirements.

H. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Fire-Test-Response Characteristics: Provide panels with finishes meeting one of 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.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of operable panel partition openings by field measurements before fabrication, if possible and within schedule constraints.
- 1.8 WARRANTY
 - A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Faulty operation of operable panel partitions.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal wear.
 - 2. Warranty Period: Ten years from date of Substantial Completion.

1.9 EXTRA MATERIALS

- A. Furnish extra materials from the same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Panel Finish-Facing Material: Furnish full width in quantity to cover both sides of two panels when installed.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. Advanced Equipment Corp.: www.advancedequipment.com.
 - B. Modernfold, Inc; Product Acousti-Seal 933E (Basis-of-Design) and Acousti-Seal 932 (Basis-of-Design for manual parition): www.modernfold.com.
 - C. Panelfold, Inc: www.panelfold.com.
 - D. Panel Operation: Manually operated, paired panels.

- 1. A series of manually operated flat steel panels in two panel hinged pair grouping; three panels hinged together are not permitted.
- 2. Final closure accomplished with a horizontally expanding panel.
- 3. Full leaf butt hinges, attached directly to panel's steel frame.
- 4. Welded hinge anchor plates within panel for additional support hinge mounting to frame.
- 5. Hinges must not anchor into panel edge or astragal.
- E. Panel Operation: Electrically operated, continuously hinged panels.
 - 1. Final closure accomplished with a horizontally expanding panel.
 - 2. Full leaf butt hinges, attached directly to panel's steel frame.
 - 3. Welded hinge anchor plates within panel for additional support hinge mounting to frame.
 - 4. Hinges must not anchor into panel edge or astragal.

2.2 COMPONENTS

- A. Operable Panel Partition: Side opening; paired panels; center stacking; manually operated.
 - 1. Panel Finish: Fabric at electric partition and markerboard at manual partition.
 - 2. Sound Transmission Class (STC): 50-52 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, on panel size of 100 sq ft.
- B. Panel Construction:
 - 1. Panel Substrate Facing: Steel sheet, minimum 21 gage.
 - 2. Provide top reinforcement as required to support panel from suspension components and provide reinforcement for hardware attachment.
 - 3. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
 - 4. Weld or lockform panel skins and weld panel skins directly to frames to form a unitized panel for non-racking rigidity and durability; panel skins which are adhesive laminated to frame, or skins not welded directly to steel frame are not permitted.
 - 5. Provide "wrap-around" skin/panel construction that does not require vertical trim on panel faces and shall, with astragal seal, provide a minimum "groove" appearance at the vertical panel joints. (Note: This is a required option when providing partitions manufactured by Advanced Equipment Corp.)
- C. Core: Minimum 18 gage formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.
 - 1. Thickness with Finish: 3 inches.
 - 2. Factory applied surface finish.
 - 3. Trim: Trimless.
 - 4. Hinges: Full leaf butt hinges, attached directly to panel's steel frame, type, 18 gage stainless steel.
 - 5. Panel to Panel Seals: Grooved and gasketed astragals; continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.
- D. Track: Formed steel; 1-1/4 x 1-1/4 inches size; thickness and profile designed to support loads, steel sub-channel and track connectors, track switches.
- E. Carriers: Ball bearing, steel wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.
- F. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.

- G. Markerboard (Manual Partition): Thermosetting resin of enamel reinforced with magnesium silicate and silicon carbide, color as selected from manufacturer's standard range.
 1. Markerboard to be full height, both sides.
- H. Fabric Finish (Electric Partition): Architect to select from Design Tex fabrics offered by the manufacturer, of weights between 12 and 14 oz./lin. yd.; color to be selected by Architect.
- I. Accessories: White enameled ceiling closure; aluminum jamb and head molding, fittings and attachments, .
 - 1. Provide, for each partition, one trimless markerboard (48 inches height by width of panel) and two trimless tackboards (48 inches height by width of panel); both sides of partition.
- J. Pocket Enclosures: Door, frame, and trim to match adjacent walls.
- K. Acoustic Sealant: Specified in Section 07 90 05.

2.3 SUSPENSION SYSTEMS

- A. Suspension Tracks: Steel with adjustable steel hanger rods for overhead support, designed for type of operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
 - 1. Head Closure Trim: As required for acoustical performance; with factory-applied, decorative, protective finish.
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
 - 1. Multidirectional Carriers: Capable of negotiating 90-degree L, T, and X intersections without track switches.
- C. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.
- D. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

2.4 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Electrical Characteristics:
 - 1. 1 hp.
 - 2. 208 volts, three phase, 60 Hz.
- B. Electric Operator: 12 inches per second travelling speed; adjustable friction clutch brake actuated by solenoid controlled motor starter; enclosed limit switch; enclosed magnetic reversing starter.
- C. Control Station:
 - 1. Control Station Partition Bisecting Room: 2 standard keyed three button OPEN-STOP-CLOSE type; 24 volt circuit; surface mounted.
 - 2. Control Station Abutting Another Operable Wall: 1 standard keyed three button OPEN-STOP-CLOSE type; 24 volt circuit; surface mounted.
 - 3. Control Station: 1 standard keyed three button OPEN-STOP-CLOSE type; 24 volt circuit; surface mounted.
 - 4. Key switch prepared for mortise lock cylinder.
 - 5. Provide cylinder keyed to Owner's masterkey program.

- 6. Furnish 3 keys.
- D. Disconnect Switch: Factory mount disconnect switch in control panel.
- E. Limit Switches: Automatic type, at both extremes of travel, to prevent over-travel.
- F. Pocket Door Interlock: Mechanism to prevent operation of panels unless storage pocket doors are fully open.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated on shop drawings.
- B. Verify track supports are laterally braced and will permit track to be level within 1/4 inch of required position and parallel to the floor surface.
- C. Verify floor flatness of 1/8 inch in 10 feet, non-cumulative.
- D. Verify wall plumbness of 1/8 inch in 10 feet, non-cumulative.

3.2 INSTALLATION

- A. Install partition in accordance with manufacturer's instructions and ASTM E 557.
- B. Install electric operator, wiring, and controls. Locate control station(s) in place to be later determined by Architect.
- C. Fit and align partition assembly and pocket doors level and plumb.
- D. Lubricate moving components.
- E. Apply acoustic sealant to achieve required acoustic performance.
- F. Coordinate electrical connections.

3.3 ADJUSTING

- A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.

3.4 CLEANING

A. Clean finish surfaces and partition accessories.

3.5 CLOSEOUT ACTIVITIES

A. Engage a factory-authorized service representative to emonstrate operation of partition and identify potential operational problems.

SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Accessories for toilet rooms and utility rooms.
- B. Grab bars.

1.2 REFERENCE STANDARDS

- A. ASTM A269 Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2010.
- B. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- C. ASTM B456 Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011e1.
- D. ASTM C1036 Standard Specification for Flat Glass; 2011e1.
- E. ASTM C1503 Standard Specification for Silvered Flat Glass Mirror; 2008.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- C. LEED Submittals: Provide product data for adhesives and sealants indicating VOC content in g/L; comply with requirements of Section 01 61 16.
- 1.4 COORDINATION
 - A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. A & J Washroom Accessories Inc: www.ajwashroom.com.
 - B. American Specialties, Inc: www.americanspecialties.com.
 - C. Bradley Corporation: www.bradleycorp.com.
 - D. Bobrick.
 - E. All items of each type to be made by the same manufacturer.

2.2 MATERIALS

- A. Accessories General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 2 keys for each accessory to Owner; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269, Type 304 or 316.

- E. Mirror Glass: Float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- F. Adhesive: Two component epoxy type, waterproof. Comply with low-emitting requirements in Section 01616.
- G. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.
- H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, satin finish, unless otherwise noted.
- C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
- 2.4 TOILET ROOM ACCESSORIES
 - A. The design for each accessory is based on products indicated on the Drawings.

2.5 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
 - 1. Mop/broom holders: 3 spring-loaded rubber cam holders at shelf front.
 - 2. Length: Manufacturer's standard length for number of holders/hooks.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.
- 1.2 REFERENCE STANDARDS
 - A. NFPA 10 Standard for Portable Fire Extinguishers; 2010.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements, and location.
- C. Product Data: Provide extinguisher operational features.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
 - A. JL Industries, Inc: www.jlindustries.com.
 - B. Larsen's Manufacturing Co: www.larsensmfg.com.
 - C. Potter-Roemer: www.potterroemer.com.

2.2 FIRE EXTINGUISHERS

- A. Fire Extinguishers General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
- B. Dry Chemical Type Fire Extinguishers: Steel tank, with pressure gage.
 - 1. Class Multi-purpose 4-A:60-B:C.
 - 2. Size 10 pounds.
 - 3. Finish: Baked enamel, color as selected.
- C. Purple-K Dry-Chemical Type in Aluminum Container (for Grease Laden Vapors at Kitchen):
 - 1. Class: UL-rated 30-B:C.
 - 2. Size: 5-lb nominal capacity.
 - 3. Potassium bicarbonate-based dry chemical in enameled-aluminum container.

2.3 FIRE EXTINGUISHER CABINETS

- A. Description: Formed steel box with aluminum trim and door.
 - 1. Fire-Rated Cabinets: Listed and labeled to comply with requirements of ASTM E 814 for fire-resistance rating of walls where they are installed.
- B. Cabinet Configuration: Recessed type.
 - 1. Sized to accommodate accessories.
 - 2. Trim: Returned to wall surface, with 1/4 to 5/16 inch projection, 1-3/4 inch wide face.

- 3. Form cabinet enclosure with right angle inside corners and seams. Form perimeter trim and door stiles.
- C. Door: Reinforced for flatness and rigidity. Hinge doors for 180 degree opening with continuous piano hinge. Provide roller type catch.
- D. Door Glazing: Glass, clear, 1/8 inch thick tempered. Set in resilient channel gasket glazing.
 1. Design: Vertical Duo.
- E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
- F. Weld, fill, and grind components smooth.
- G. Finish of Cabinet Exterior Trim and Door: Clear anodized.
- H. Finish of Cabinet Interior: White enamel.

2.4 ACCESSORIES

A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure rigidly in place.
- C. Place extinguishers and accessories in cabinets.

SECTION 10 50 00 - LOCKERS

PART - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Student wardrobe lockers.
 - 2. Staff lockers.

1.2 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of locker and bench.
- B. LEED Report: For new wood bench tops, submit vendor invoices. For FSC certified new wood, submit FSC Chain-of-Custody certificates indicating compliance with forest certification requirements and vendor invoice indicating Chain-of-Custody.
- C. LEED Report: Submit documentation for use of recycled materials, as required by Division 01 LEED sections and appropriate forms, and Section 01 30 00.
 - 1. Provide documentation of recycled content type and percentage and costs.
- D. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work. Show locker fillers, trim, base, and accessories.
 - 1. Include locker-numbering sequence.
 - 2. Locker combinations must be cross referenced with locker numbers; individual lockers must have a minimum of five series of combinations that can be changed by the Owner as necessary. The cross reference information must be submitted in electronic format for the Owner's use.
- E. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.
- F. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals specified in Division 1.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain locker units and accessories through one source from a single manufacturer.
- B. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)."
- C. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for locker installation.
- B. Protect lockers from damage during delivery, handling, storage, and installation.

PART - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:

- 1. Art Metal Products.
- 2. List Industries, Inc.
- 3. Lyon Metal Products, Inc.
- 4. Penco Products, Inc.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 366/A 366M, matte finish, suitable for exposed applications, and stretcher leveled or roller leveled to stretcher-leveled flatness.
 - 1. Recycled Content: Provide steel with minimum 30 percent total recycled content including at least 25 percent post-consumer recycled content.
- B. Fasteners: Zinc- or nickel-plated steel, slotless-type exposed bolt heads, and self-locking nuts or lock washers for nuts on moving parts.

2.3 WARDROBE LOCKERS

- A. Sizes:
 - 1. Student: 4 feet high, 12 inches wide, 12 inches deep.
 - 2. Staff: 6 feet high, 12 inches wide, 12 inches deep.
- B. Body: Form backs, tops, bottoms, sides, and intermediate partitions from steel sheet; flanged for double thickness at back vertical corners. Comply with the following:
 - 1. Back and Side Material Sheet Thickness: 24 gage.
 - a. Where double rows of lockers occur, supply lockers with individual backs placed back-to-back and fastened together.
 - 2. Top and Bottom Material Sheet Thickness: 20 gage.
 - 3. Exposed Ends: Form exposed ends of nonrecessed lockers from minimum 16 gage thick steel sheet.
- C. Frames: Form channel frames from minimum 16 gage thick steel sheet; lapped and welded at corners. Form continuous integral door strike on vertical frame members. Provide resilient bumpers to cushion door closing.
 - 1. Cross Frames: Form intermediate channel cross frames between tiers from minimum 16 gage thick steel sheet. Weld to vertical frame members.
 - 2. Latching shall be achieved by securing an 11 gauge frame hook to the locker side frame located midway up on the door.
- D. Doors:
 - 1. One-piece steel sheet, formed into double return flanges at vertical edges and flanged at right angles at top and bottom edges. Fabricate to prevent springing when opening or closing, and to swing 180 degrees.
 - 2. Comply with the following:
 - a. Sheet Thickness: 14 gage minimum.
 - b. Doors on tiered lockers shall be reinforced with a full height 16 gauge channel reinforcement.
 - c. Concealed Vents: Provide slotted perforations in top and bottom horizontal return flanges of doors. Doors shall be flush design without louvers or perforations.
- E. Shelves: Provide hat shelf in single-tier units; fabricated from minimum 24 gage thick, formed steel sheet; flanged on all edges.
- F. Hinges: Steel, full loop, five or seven knuckle; tight pin; minimum 2 inches high. Weld to inside of door frame and attach to door with at least two factory-installed fasteners that are completely concealed and tamper resistant when door is closed. Provide at least three hinges

for each door more than 36 inches high and at least two hinges for each door 36 inches high or less.

- G. Recessed Handle and Latch: Manufacturer's standard housing, formed from 20 gage stainless steel, with integral door pull, recessed for locking devices as follows:
 - 1. Staff Lockers: Provide single-point II safety latch system with built-in dead bolt combination lock.
 - 2. At Student Lockers: Frame hook shall have a padlock hasp protruding through the stainless steel recessed pocket. Padlocks to be supplied by Owner.
 - 3. Doors shall have a catch to retain unlocked doors in the closed position and are to be self latching upon closing.

2.4 LOCKER ACCESSORIES

- A. Interior Equipment: Furnish each locker with the following items, unless otherwise indicated:
 - 1. Hooks: Manufacturer's standard zinc-plated, ball-pointed steel. Provide one double-prong ceiling hook, and not fewer than two single-prong wall hooks. Attach hooks with at least two fasteners.
- B. Number Plates: Manufacturer's standard etched, embossed, or stamped, aluminum number plates with numerals at least 3/8 inch high. Number lockers in sequence as directed by the Owner. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
- C. Continuously Sloping Tops: Manufacturer's standard, fabricated from minimum 16 gage thick steel sheet, for installation over lockers with separate flat tops. Fabricate tops in lengths as long as practicable, without visible fasteners at splice locations, finished to match lockers.
- D. Filler Panels: Manufacturer's standard; fabricated from minimum 18 gage thick steel sheet in an unequal leg angle shape, and finished to match lockers. Provide slip joint filler angle formed to receive filler panel.
 - 1. Lockers to be placed in center of available space for locker run with filler panels, of equal widths, at both ends of each locker run when required; a single filler panel at end of each locker run will not be accepted.
- E. Boxed End Panels: Manufacturer's standard; fabricated from minimum 16 gage thick steel sheet, with 1-inch-wide edge dimension, finished to match lockers, and designed for concealing exposed ends of nonrecessed lockers.

2.5 FABRICATION

- A. Knock-Down Construction: Fabricate lockers for nominal assembly at Project site.
- B. Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch. Weld frame members together to form a rigid, one-piece assembly. Form locker-body panels, doors, shelves and accessories from one-piece steel sheet, unless otherwise indicated.

2.6 ADA COMPLIANT LOCKERS

- A. Provide one handicapped accessible locker for every 50 lockers installed, complying with the following:
 - 1. Forward Reach Requirement: Provide single tier lockers with a hat/hook shelf and coat hooks located not more than 48 inches above finished floor. Provide one additional shelf near the bottom of the locker so that it is not lower than 15 inches above finished floor.

- 2. Place ADA compliant lockers at least 24 inches away from any wall or other obstacle and provide a minimum clear floor space of 30 by 48 inches with 10-inch minimum for door swing. Provide an area in front of locker within 60-inch-diameter turning circle to allow unobstructed access.
 - a. Coordinate location with Owner.
- 3. Signage: Provide metal or plastic signage to Owner with the international symbol of accessibility to the face of ADA compliant locker doors. Owner will install.

2.7 FINISHES, GENERAL

- A. Finish all steel surfaces and accessories, except prefinished stainless-steel and chrome-plated surfaces.
- B. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond. Use manufacturer's standard methods.
- B. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-enamel finish consisting of a thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 1.4 mils on doors and frames, and 1.1 mils elsewhere.
- C. Locker Colors: As selected from manufacturer's standard color range. A maximum of 5 colors will be selected.

2.9 LOCKER BENCHES

- A. Standard Bench Tops: Clear hardwood tops 9-1/2 inches wide by 1-1/4 inches thick.
- B. ADA Bench Top: Clear hardwood tops 20 inches by 42 inches by 1-1/4 inch thick, provide with four supports (two each end).
- C. Supports: Steel pipe standards spaced not more than 6 feet on center.
- D. Overall Height: 17-3/4 inches.
- E. Finish:
 - 1. Wood: Three coats of polyurethane.
 - 2. Steel: Primer and two coats of enamel; color to match lockers.
- F. Attach each standard to top by screws and anchor to floor by two suitable anchors.

PART - EXECUTION

3.1 INSTALLATION

- A. Install metal lockers and accessories level, plumb, rigid, and flush according to manufacturer's written instructions. Anchor framing consist of 3 horizontal rows of continuous 2 x 4 wood framing behind lockers. Secure to wall with construction adhesive and cut nails.
- B. Anchor lockers to built up bases and walls at intervals recommended by manufacturer, but not more than 36 inches o.c. Install anchors through backup reinforcing plates where necessary to avoid metal distortion, using concealed fasteners. Install lockers in accordance with details indicated on Drawings.
- C. Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates. Attach recess trim to recessed lockers with concealed clips.
- D. Attach boxed end panels with concealed fasteners to conceal exposed ends of nonrecessed lockers.
- 3.2 ADJUSTING, CLEANING, AND PROTECTION
 - A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.
 - B. Clean interior and exposed exterior surfaces and polish stainless-steel and nonferrous-metal surfaces.
 - C. Protect lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit locker use during construction.
 - D. Touch up marred finishes to factory-finished appearance, or replace locker units that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

SECTION 10 56 13 - METAL STORAGE SHELVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal storage shelving.
- B. Shelving accessories.
- 1.2 REFERENCE STANDARDS
 - A. ANSI MH28.1 American National Standard for the Design, Testing, Utilization and Application of Industrial Grade Steel Shelving Specifications; 1997.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Rated uniform shelf loads.
 - 2. Details of shelving assemblies, including reinforcement.
 - 3. Accessories.
- C. Test Reports: Provide independent agency test reports documenting compliance with specified structural requirements.
 - 1. In lieu of test reports, detailed drawings stamped and sealed by a Professional Engineer licensed in the State of Maryland will be acceptable.
- D. Shop Drawings: Indicate location, type, and layout of shelving, including lengths, heights, and aisle layout, and relationship to adjacent construction.
 - 1. Indicate methods of achieving specified anchoring requirements.
- E. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and finishes.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Inspect for dents, scratches, or other damage. Replace damaged units.
- B. Store in manufacturer's unopened packaging until ready for installation.
- C. Store under cover and elevated above grade.
- 1.5 WARRANTY
 - A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
 - B. Provide one year manufacturer warranty covering defects of manufacturing and workmanship and rust and corrosion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Four Post Shelving:
 - 1. Hallowell, Div. of List Industries, Inc : www.hallowell-list.com.
 - 2. Penco Products, Inc : www.pencoproducts.com.
 - 3. SpaceSaver Corporation: www.spacesaver.com.

4. Lyon Metal Products, Inc.

2.2 SHELVING - GENERAL

- A. See drawings for layout and sizes.
- B. Fabricate all units as initial shelving units with a post at each corner so that units may be moved or relocated by Owner as desired
- C. Shelving: Provide products tested to comply with ANSI MH28.1 for design criteria, lateral stability, shelf connections, and shelf capacity.
- D. Anchors: Provide anchoring hardware to secure each shelving unit to wall.
 - 1. Provide hardware of type recommended by manufacturer for substrate.

2.3 FOUR POST SHELVING

- A. Four Post Shelving: Steel post-and-beam type with sway bracing, shelving brackets, shelving surfaces, and accessories as specified.
 - 1. Unit Width: 36 inches, center to center of posts.
 - 2. Capacity: Minimum 1,200 pound capacity for dead weight evenly distributed over a 36 inches wide x 18 inch deep shelf, including minimum 1.65 safety factor.
 - 3. Shelf Deflection: 1/4 inch in 36 inches, maximum, under rated uniform load.
 - 4. Adjustability of Shelving: At intervals of 1-1/2 inches on center maximum.
 - 5. Shelves per Unit: As indicated on drawings.
 - 6. Finish: Baked enamel, medium gloss.
 - 7. Color: As selected by Architect from manufacturer's standard range.
 - 8. Number of Units: As indicated on drawings.
- B. Posts and Beams: Formed sheet members; perforations may be exposed on face of members.
 - 1. Metal Thickness: 16 gage.
 - 2. Post Face Width: 2 inches, maximum.
 - 3. Connecting Hardware: Manufacturer's standard.
 - 4. Post Bases: Flat steel foot plate, with manufacturer's recommended adjustable leveling device.
- C. Bracing: Formed sheet members.
 - 1. Back Sway Bracing: Either strap or panel; at back of each unit.
 - 2. Side Sway Bracing: Either strap or panel; at each side of each unit.
 - 3. Strap Sway Bracing: One strap installed diagonally, 16 gage; welded, riveted, or bolted to uprights.
 - 4. Panel Sway Bracing: Formed sheet metal panels, 20 gage; welded, riveted, or bolted to uprights.
- D. Shelves: Formed sheet, finished on all surfaces .
 - 1. Metal Thickness: 16 gage.
 - 2. Shelf Edge Profile: Extending 3/4 inch, maximum, below top surface of shelf.
 - 3. Shelf Connection to Posts: Manufacturer's standard.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify that substrate is level and that clearances are as specified.
 - B. Verify that walls are suitable for shelving attachment.
 - C. Do not begin installation until substrates have been properly prepared.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Anchor and reinforce as specified, as indicated on drawings, and as recommended by manufacturer.
- C. Install shelving with shelf surfaces level and vertical supports plumb; adjust feet and bases as required.
- D. Out-Of-Square Tolerance Four Post Shelving: Maximum of 1/8 inch difference in distance between bottom shelf and canopy top, measured along any post in any direction.

3.3 PROTECTION

- A. Clean area after installation.
- B. Protect installed products until completion of project.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 10 73 10 - PROTECTIVE COVERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Engineering design, fabrication and installation of complete welded, extruded aluminum canopies.
- 1.2 RELATED REQUIREMENTS
 - A. Section 07 90 05 Joint Sealants.

1.3 REFERENCE STANDARDS

- A. ASCE 7-95 Minimum Design Loads for Buildings and Other Structures.
- B. AWS D1.1/D1.1M Structural Welding Code Steel.
- C. AWS D1.2 Structural Welding Code Aluminum.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's product information, specifications and installation instructions for building components and accessories.
- C. Shop Drawings: Submit detailed drawings, all mechanical joint locations with complete details, connections, jointing and accessories.
- D. Certification: Submit design calculations signed by a Registered Professional Engineer, licensed in the State of Maryland. Design calculations shall state that the protective cover system design complies with the wind requirements of ASCE 7-95, the stability criteria of applicable building code, and all other governing criteria.
- E. Samples for Initial Selection: For each colored or finished component of each type of protective cover indicated.
 - 1. Include similar Samples of accessories involving color selection.
- F. Welding certificates.
- G. LEED Submittals:
 - 1. Credit MR 4.1 and 4.2: Product Data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
 - a. Contributions to this Credit include recycled content of aluminum.
- H. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Protective cover shall be wholly produced by a recognized manufacturer with at least five years experience in the design and fabrication of extruded aluminum protective cover systems. Components shall be assembled in shop to greatest extent possible to minimize field assembly. Protective cover shall be installed by manufacturer. Third party installation is not acceptable.
- B. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code Steel."
 - 2. AWS D1.2, "Structural Welding Code Aluminum."

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of awnings in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Where awning installation is indicated to fit to other work, verify dimensions of other work by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for fenestration operation throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer and fabricator agree to repair or replace components that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: 5 years from date of Substantial Completion.
- B. 20-year warranty on finish including checking, crazing, peeling, chalking, fading and/or adhesion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Mapes Industries, Inc.; Super Lumideck Hanger Rod Canopy.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering covers that may be incorporated into the Work include, but are not limited to, the following:
 - 1. American Walkway Covers.
 - 2. Dittmer Architectural Aluminum.
 - 3. E. L. Burns Company, Inc.
 - 4. Peachtree Protective Covers.
 - 5. Perfection Architectural Covers, Inc.

2.2 MATERIALS

- A. Aluminum Members: All sections shall be extruded aluminum 6063 alloy, heat treated to T-6 temper.
- B. Fasteners: Fasteners shall be aluminum, 18-8 stainless steel or 300 series stainless steel.
- C. Gaskets: Gaskets shall be dry seal santoprene pressure type.
- D. Sealants: Single component silicone, in color to match sheets and extrusions; refer to Section 07 90 05 Joint Sealants.

2.3 COMPONENTS

A. Beams: Beams shall be open-top tubular extrusion of size and shape shown on drawings, top edges thickened for strength and designed to receive deck members in self-flashing manner. Structural ties shall be installed in tops of all beams.

- B. Deck: Deck shall be extruded self-flashing sections interlocking into a composite unit. Closures at deck ends shall be welded plates.
- C. Hanger Rods: Galvanized/zinc plated; minimum 3/4 inch diameter pipe with attachment hardware.
- D. Fascia:
 - 1. Fascia shall be extruded aluminum; manufacturer's custom 12 inch shape.
 - 2. Provide on all sides of protective cover, including side against exterior wall construction.
- E. Flashing: Flashing shall be 0.040 aluminum (min.). All thru-wall flashing by others.
- F. Accessories: Flashings, brackets and other items necessary for a complete installation.
 - 1. Connect to adjacent downspouts draining into storm drain system, as available to location; perforated drainage at other locations.

2.4 FABRICATION

- A. Bent Construction: Beams shall be factory welded with neatly mitered corners into one-piece rigid bents. All welds shall be smooth and uniform using an inert gas shielded arc. Suitable edge preparation shall be performed to assure 100% penetration. Grind welds only where interfering with adjoining structure to allow for flush connection. Field welding is not permitted. Rigid mechanical joints shall be used when shipping limitations prohibit the shipment of fully welded bents.
- B. Deck Construction: Deck shall be manufactured of extruded modules that interlock in a self-flashing manner. Interlocking joints shall be positively fastened at 8" O.C. creating a monolithic structural unit capable of developing the full strength of the sections. The fastenings must have minimum shear strength of 350 pounds each. Deck shall be assembled with sufficient camber to offset dead load deflection.
- C. Concealed Drainage: Water shall drain from covered surfaces into integral fascia gutter and directed to indicated discharge.
- D. Form exposed field connections with hairline joints, flush and smooth, using concealed fasteners where possible.

2.5 FINISHES

- A. Flouropolymer Finish: AAMA 605.2, two coat; color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight.
 - 1. Match Architect's sample.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for supporting members, inserts, installation tolerances, and other conditions affecting performance.
 - B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Erection:
 - 1. Installation to be in strict accordance with manufacturer's shop drawings.
 - 2. Protect the finish of components during handling and erection.
 - 3. Protective cover shall be erected true to line, level and plumb.

- B. Protective cover components shall be cleaned promptly after installation.
- C. Extreme care shall be taken to protect materials during and after installation.

SECTION 10 75 00 - FLAGPOLES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes a ground-set flagpole made from aluminum.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles" unless governing jurisdiction provides other requirements.
 - 1. Base flagpole design on nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.
 - 2. Basic Wind Speed: 100 mph; 3-second gust speed at 33 feet aboveground.

1.3 SUBMITTALS

- A. Product Data: For type of flagpole required.
- B. Shop Drawings: Include elevations and details showing general arrangement, jointing, fittings and accessories, grounding, and anchoring and supporting systems.
 - 1. Include details of foundation system for ground-set flagpole.
- C. Structural Calculations: Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Qualification Data: For professional engineer.

1.4 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. Obtain flagpole as a complete unit, including fittings, accessories, bases, and anchorage devices, from a single manufacturer.
 - 2. Obtain flagpole through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. General: Spiral wrap flagpole with heavy paper and enclose in a hard fiber tube or other protective container.

1.6 COORDINATION

A. Provide anchoring devices to precast concrete manufacturer for casting.

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. American Flagpole; a Kearney-National Inc. Company.
 - 2. Baartol Company Inc. (The)
 - 3. Concord Industries, Inc.
 - 4. Ewing International.
 - 5. Lingo Inc.; Acme Flagpole Division.
 - 6. Michigan Flagpole Inc.

- 7. Morgan-Francis Div.; Original Tractor Cab Co., Inc.
- 8. Pole-Tech Company Inc.

2.2 FLAGPOLE

- A. Flagpole Construction, General: Construct flagpole in one piece if possible. If more than one piece is necessary, comply with the following:
 - 1. Fabricate shop and field joints without using fasteners, screw collars, or lead calking.
 - 2. For tapered flagpoles, provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.
- B. Exposed Height: 30 feet.
- C. Aluminum Flagpole:
 - 1. Provide cone-tapered flagpole fabricated from seamless extruded tubing complying with ASTM B 241, Alloy 6063, with a minimum wall thickness of 3/16 inch.
 - 2. Heat treat after fabrication to comply with ASTM B 597, Temper T6.
- D. Foundation Tube: Galvanized corrugated-steel foundation tube, 0.064-inch minimum nominal wall thickness. Provide with 3/16-inch steel bottom plate and support plate; 3/4-inch diameter, steel ground spike; and steel centering wedges all welded together. Galvanize steel parts, including foundation tube, after assembly. Provide loose hardwood wedges at top of foundation tube for plumbing pole.
 - 1. Provide flashing collar of same material and finish as flagpole.
 - 2. Provide steel ground protectors extending 12 inches aboveground and 6 inches belowground for steel flagpoles where flashing collars are not provided.

2.3 FITTINGS

- A. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.
 - 1. 0.063-inch spun aluminum, finished to match flagpole.
- B. Internal Halyard, Cam Cleat System: 5/16-inch- diameter, braided polypropylene halyard; cam cleat; and concealed revolving truck assembly with plastic-coated counterweight and sling. Provide flush access door secured with cylinder lock. Finish truck assembly to match flagpole.
 - 1. Halyard Flag Snaps: Provide two chromium-plated bronze swivel snap hooks per halyard.
 - 2. Provide with neoprene or vinyl covers.

2.4 MISCELLANEOUS MATERIALS

- A. Concrete: Comply with requirements in Division 3 Section "Building Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi.
- B. Sand: ASTM C 33, fine aggregate.
- C. Elastomeric Joint Sealant: Multicomponent urethane joint sealant complying with requirements in Division 7 Section "Joint Sealers" for Use NT (nontraffic) and for Use M, G, A, and, as applicable to joint substrates indicated, O joint substrates.

2.5 FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
1. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 EXECUTION

- 3.1 PREPARATION
 - A. Prepare uncoated metal flagpole that is set in a foundation tube by painting below-grade portions with a heavy coat of bituminous paint.
 - B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.
 - C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms and foundation tube, sleeve, or anchor bolts in position, to prevent displacement during concreting.
 - D. Place concrete immediately after mixing. Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use nonstaining curing compound.
 - E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.
- 3.2 FLAGPOLE INSTALLATION
 - A. General: Install flagpole where shown and according to Shop Drawings and manufacturer's written instructions.
 - B. Foundation-Tube Installation: Install flagpole in foundation tube, seated on bottom plate between steel centering wedges. Plumb flagpole and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.

END OF SECTION

SECTION 11 31 00 - APPLIANCES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Appliances.
- 1.2 REFERENCE STANDARDS
 - A. UL (EAUED) Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

A. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.

1.5 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
- C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.
- D. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

PART 2 PRODUCTS

- 2.1 APPLIANCES
 - A. The design for each appliance is based on products indicated on the Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify utility rough-ins are present and correctly located.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Anchor built-in equipment in place.

3.3 ADJUSTING

- A. Adjust operating equipment to efficient operation.
- 3.4 CLEANING
 - A. Remove packing materials from equipment.
 - B. Wash and clean equipment.

END OF SECTION

SECTION 11 40 00 – FOODSERVICE EQUIPMENT

PART 1 GENERAL

1.1 DESCRIPTION

- A. Scope: Furnish all labor, materials, services, equipment and appliances required to provide and deliver all foodservice equipment hereinafter specified into the building, uncrate, assemble, hang, set-in-place, level, and completely install, exclusive of final utility connections.
- B. Related Work Specified Elsewhere:
 - 1. All plumbing, electrical and ventilating work required in conjunction with commercial foodservice equipment including rough-in to points indicated on mechanical drawings, and final connections from rough-in points, electrical service to points of connection and final connections shall be by Divisions 22, 23 and 26.
 - 2. Refrigeration work will be done by the Kitchen Equipment Contractor except for electrical and plumbing connections to and between compressors, blower coils, controls, etc. These final connections shall be by Divisions 22 and 26.
 - 3. All traps, steam traps, grease traps, line strainers, tail pieces, valves, stops, shut-offs, and fittings necessary for equipment specified will be furnished and installed under mechanical contract by Division 22 unless specifically called for otherwise under each item.
 - 4. All line and disconnect switches, safety cut-offs and fittings, convenience boxes or other electrical controls, fittings and connections will be furnished and installed under electrical contract by Division 26, unless specifically indicated otherwise in the item specifications. Starting switches for certain specified pieces of foodservice equipment are to be provided by Kitchen Equipment Contractor. Those starting switches, if furnished loose as standard by Foodservice Manufacturers (other than fabricated items), shall be mounted and wired complete under Division 26.
 - 5. Any sleeves or conduit required for refrigeration, syrup tubing, or carbonation tubing will be furnished and installed under Division 22.
 - 6. Unless specifically called for in the Item Specifications, ventilating fans and all duct work between same and ceiling rough-in openings, and from same to discharge opening in building will be furnished and installed by Division 22.

1.2 DEFINITIONS

- A. All references to the terms "Contractor", "Kitchen Equipment Contractor", or "K.E.C." in the specifications and/or on the drawings shall be defined to mean the Kitchen Equipment Contractor.
- B. All references to the term "Owner" in the specifications and/or on the drawings shall be defined to mean the Owner or Owner's designated representative and the Foodservice Equipment Consultant.
- C. All references to the term "Consultant" or "Foodservice Equipment Consultant" in the specifications and/or on the drawings shall be defined to mean **NYIKOS ASSOCIATES, INC.** its employees, and authorized representatives and is referred to throughout the contract documents as if singular in number and masculine in gender.
- D. The phrase "The K.E.C. shall" or "by the K.E.C.", as applicable, is understood to be included as a part of each sentence, paragraph or article of these specifications unless otherwise indicated or specified.
- 1.3 QUALITY ASSURANCE
 - A. Qualification of Suppliers:

- 1. Commercial foodservice equipment suppliers shall submit satisfactory evidence of compliance with the following qualifications and conditions to be approved.
 - a. Successful completion of jobs of comparable scope.
 - b. Have manufacturer's authorization to distribute and install specified factory items of equipment.
 - c. Maintain a permanent staff experienced in the installation of foodservice equipment and preparation of professional style rough-in drawings and brochures.
 - d. Maintain or have access to fabrication shop meeting N.S.F. requirements. If other than foodservice equipment suppliers own fabrication shop, obtain Consultant approval of fabrication shop desired to be used.
 - e. Maintain or have access to a readily available stock of repair and replacement parts, together with authorized service personnel.
- B. Qualification of Fabricators:
 - 1. Fabricators shall be an N.S.F. approved organization with trained personnel and facilities to properly design, detail and fabricate equipment in accordance with the specifications and standard details contained herein.
 - 2. Custom fabricated equipment shall bear the National Sanitation Foundation seal of approval and listed as such under N.S.F. Standards No. 2 and No. 33.
 - 3. Only one (1) fabricator shall be used for this project, and all equipment will be fabricated at the same shop. Where units cannot be fully shop-fabricated, complete fabrication at project site.
 - 4. Acceptable fabricators are:
 - a. Pro Stainless, Inc., Keyser, WV
 - b. Commercial Stainless, Inc., Bloomsburg, PA
 - c. Keystone Custom Fabricators, Inc.; Elizabeth, PA.
 - d. Southern Equipment Fabricators, Inc.; Columbia, SC
 - e. Stainless Unlimited, Inc.; Waldorf, MD
 - f. Other fabricators, as approved by Consultant.
- C. Qualification of Manufacturers:
 - 1. Manufacturers shall be regularly engaged in the production of items furnished and shall have demonstrated the capability to furnish similar equipment that performs the functions specified or indicated herein.
- D. Standard Products:
 - 1. Materials, products, and equipment furnished under this contract shall be the standard items of manufacturers regularly engaged in the production of such materials, products, and equipment and shall be of the manufacturer's latest design that complies with the specifications which have been produced and used successfully on other projects and in similar applications.
 - 2. Discrepancies within contract documents should immediately be brought to the attention of the Consultant in writing for clarification prior to fabrication or ordering of standard items.

1.4 PLANS & SPECIFICATIONS

A. Specifications and drawings have been prepared to form the basis for procurement, erection, start-up and adjustment of all equipment in this contract. Plans and specifications shall be considered as mutually explanatory and work required by one, but not the other, shall be performed as though required by both. Items required by one, but not by the other shall be provided as though required by both. Work shall be accomplished as called for in specifications and shown on drawings, so that all items of equipment shall be completely functional for purpose for which they were designed. When there is any discrepancy between drawings and

specifications, drawings shall govern. Bidders should seek clarification of any discrepancies from the Consultant prior to bidding.

1.5 SUBMITTALS

- A. General Requirements:
 - 1. Within six (6) weeks or earlier, as required, assemble and submit all shop drawings, roughin drawings, brochures, color samples, etc. as a complete package. There will be no review of partial submittals.
 - 2. Any and all costs, to all trades and parties involved, arising from delay of project due to non-submittal of the complete package by the K.E.C. within a reasonable time period shall be borne solely by the K.E.C.
 - 3. Identify each submittal by project name, date, contractor, submittal name, and any other necessary information to distinguish it from other submittals.
- B. Shop Drawings:
 - 1. Submit shop drawings electronically in PDF format, drawn on sheets equal in size to Contract Documents of equipment specified for custom fabrication including all accessories attached to each item.
 - 2. Drawings shall be detailed and fully dimensioned to a minimum scale of 3/4"=1'-0" for plan and elevation views, and 1-1/2"=1'-0" for sections, based on the floor plan(s) and following item specifications. Drawings will be checked for thoroughness, accuracy, completeness, neatness, and returned for corrections, if necessary.
- C. Rough-in Drawings:
 - 1. Submit rough-in drawings electronically in PDF format, drawn on sheets equal in size to Contract Documents of detailed arrangement plans professionally prepared from architects dimensioned plans (not traced from Contract Documents) at a minimum scale of 1/4"=1'-0".
 - 2. Equipment Layout Plan showing arrangement of all items specified and identified on schedule of equipment listing item number, description, quantity, manufacturer, model number, and remarks.
 - 3. Ventilation Plan showing dimensioned locations of all duct openings for ventilators and dishmachines identifying size, c.f.m. required (exhaust and supply), static pressures, and connection heights.
 - 4. Plumbing/Electrical Plans showing dimensioned locations, sizes, elevations and capacities of all utility services required for each item of equipment in relation to finished walls, columns, and heights above finished floor.
 - 5. Special Conditions Plan showing exact dimensions and details of all masonry bases, floor depressions, critical partition locations/heights, wall openings, reinforcing for wall and/or ceiling mounted equipment, and conduit locations for soda and compressed gas lines.
- D. Equipment Brochures:
 - 1. Submit electronic files in PDF format of manufacturer's illustrations and technical data for approval prior to procurement. All items of Standard Manufacture shall be submitted, including items purchased to be built into fabricated equipment. Each illustration shall be marked to accurately describe the item to be furnished as specified. Include all deviations from standard information (i.e., voltage, phase, load, etc.).
 - 2. Include a separate information sheet ahead of each illustration sheet showing all service connection sizes, electrical requirements, loads, consumptions, and all accessories specified.
 - 3. Manufacturer's suggested schematic drawings for connection of mechanical and electrical services for such items as booster heaters, disposers, or any other item of equipment that

may require the same.

- E. Miscellaneous Shop Drawings:
 - 1. Submit electronic files in PDF format of manufactured equipment specified requiring clarification and approval such as, walk-in cooler/freezer drawings, ventilator drawings, utility raceway drawings, and refrigeration system drawings.
- F. Operation and Maintenance Manuals:
 - 1. Submit electronic files in PDF format for all mechanically operated equipment of standard manufacture. Include operating and cleaning/maintenance instructions, parts listing, recommended parts inventory listing and purchase source, copy of warranties, and similar applicable information.
 - 2. Brochure covers shall bear the job name, date, and name of contractor.
- G. Manufacturer's List:
 - 1. The K.E.C. shall submit electronic files in PDF format a list of all manufacturer's representatives of the food service equipment such as convection ovens, ranges, etc., and their authorized service agencies' addresses and telephone numbers; to be presented after submission of manufacture data.
- H. Samples:
 - 1. Samples of materials, products, and fabrication methods, shall be submitted for approval upon request at no additional cost, before proceeding with work.
- I. Re-submission Requirements:
 - 1. Shop Drawings:
 - a. Revise initial drawings as required and resubmit in accordance with submittal procedures.
 - b. Indicate on drawings all changes which have been made in addition to those requested by Consultant.
 - 2. Product Data and Samples:
 - a. Submit new data and samples as required for initial submittal.
 - b. Make all re-submittals within fourteen (14) working days from date of Consultants previous action.
- J. Approvals:
 - 1. After approval of the submittals listed above, furnish as many prints and copies as are required for the various trades, the Owner, the Architect, and the Consultant.
 - 2. The approval of the shop drawings will be general and shall not relieve the K.E.C. of responsibility for proper fitting, finishing, quantities, and erection of work in strict accordance with the contract requirements, nor does it relieve him of the responsibility of furnishing material and workmanship not indicated on approved shop drawings but required for the completion of his work.
 - 3. Approval by the Consultant and/or Owner of the manufacturer's data submitted by the K.E.C. does not waive the responsibility of K.E.C. to furnish each item of equipment in complete compliance with the specifications and drawings. Discrepancies between Contract Documents and furnished equipment shall be corrected even after approval and installation of this equipment at no additional cost to the Owner.
- K. LEED Submittals:
 - 1. Provide documentation of VOC content in g/L for installation adhesives and sealants; comply with VOC limits of Section 01 61 16.
 - 2. For hand washing sink faucets and spray rinse valves, documentation indicating flow rate in gallons per minute (gpm).

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery:
 - 1. Equipment shall be delivered to the job site only after the building is weather-safe and vandal-safe.
- B. Storage:
 - 1. Store equipment in an area convenient to the point of installation in such a way that it is protected from the weather and job hazards.
- C. Protection:
 - 1. Wrapping and protective coatings shall remain on all items until ready for use and in the case of stainless steel items, until installation is complete and the job is ready for cleaning.
- D. Damage:
 - 1. All responsibility shall rest with the K.E.C. for any damage or loss incurred prior to final acceptance. Such items as may be lost or damaged shall immediately be replaced or repaired to a new condition to the complete satisfaction of and at no additional cost to the Owner.

1.7 JURISDICTION TRADE AGREEMENTS AND RESTRICTIONS

A. Include the work specified, shown or reasonably infer able as part of foodservice equipment. Portions of this work may be subcontracted to those qualified to do such work, as may be necessary because of jurisdictional trade agreements and restrictions.

1.8 REGULATIONS AND CODES

- A. Except as otherwise indicated, each item of equipment shall comply with the latest current edition of the following standards as applicable to the manufacture, fabrication, and installation of the work in this section.
 - 1. <u>N.S.F. Standards</u>: Comply with National Sanitation Foundation Standards and criteria, and provide N.S.F. "Seal of Approval" on each manufactured item and major items of custom-fabricated work.
 - 2. <u>U.L. Standards</u>: For electrical components and assemblies, provide either U.L. labeled products or, where no labeling service is available, provide a complete index of the components used as selected from the U.L. "Recognized Component Index".
 - 3. <u>A.N.S.I. Standards</u>: For gas-burning equipment, comply with A.N.S.I. Z21-Series standards. Comply with A.N.S.I. B57.1 for compressed gas cylinder connections and with applicable standards of the Compressed Gas Association for water connection air gaps and vacuum breakers.
 - 4. <u>A.G.A.</u>: All gas-fired equipment shall be A.G.A. Approved, equipped to operate on the type gas available at the job site and shall contain 100% automatic safety shut-off devices.
 - 5. <u>N.F.P.A. Standards</u>: Comply with N.F.P.A. Bulletin 96 for exhaust systems and with N.F.P.A. Bulletins 17 & 96, and U.L. 300 for fire extinguishing systems.
 - 6. <u>A.S.M.E. Code</u>: Comply with A.S.M.E. boiler code requirements for steam generating and steam heated equipment. Provide A.S.M.E. inspection, stamps, and certification of registration with National Board.
 - 7. <u>National Electric Code</u>: Comply with N.E.C. Volume 5 for electrical wiring and devices included with foodservice equipment.
 - 8. All authorities having jurisdiction over this type of equipment and/or installation.
 - 9. Where specifications and/or drawings require mechanical, electrical or refrigeration work to be performed, such work shall be done in strict conformance to other portions of the Base Building Specification which sets forth standards for this type of work.
 - 10. Where there exists two standards or codes for one type of work, the stricter method shall

govern.

1.9 WARRANTIES

- A. Warrantee in writing all equipment and fabrication against defects and workmanship for a period of two (2) years from date of acceptance.
 - 1. Each piece of mechanical equipment shall be listed, together with the authorized service and repair agency whom the Owner will call should malfunctions occur within the two-year (2) guarantee period.
- B. Refrigeration system compressors shall be warranted for five (5) years by the manufacturer. Free refrigeration service, including parts and labor, shall be furnished for two (2) years from date of acceptance, unless otherwise specified.

1.10 JOB CONDITIONS

- A. Visit the job site to field check actual wall dimensions and roughing-in and shall be responsible for fabricating and installing the equipment in accordance with the available space and utility services as they exist on the job site.
- B. Check all door openings, passageways, elevators, etc., to be sure that the equipment can be conveyed to its proper location within the building and if necessary, check the possibility of holding wall erection, placement of doorjambs, windows, etc. for the purpose of moving the equipment to its proper location with the General Contractor. Any removal and rebuilding of walls, partitions, doorjambs, etc. necessary to place the equipment, or if caused by incorrect information on the Contractor's drawings, shall be done at the expense of the K.E.C., at no additional cost to the Owner.
- C. Notify the Consultant and Owner before fabrication of equipment of any discrepancies between plans and specifications and actual conditions on the job.
- D. Before finished floors, walls, and/or ceilings are in place, physically check the location of all "rough-ins" at the job site. Report discrepancies in writing.
- E. Any changes required after fabrication has been started to ensure equipment accurately fitting the space as it exists and conforming to actual field dimensions on the job shall be made at no additional cost to the Owner.
- F. If special hoisting equipment and operators are required, include such cost as part of the bid for this work.

1.11 CHANGES IN THE WORK

A. The Owner reserves the right to require reasonable modification to be made in the routing of work and relocation of equipment. This specifically refers to conditions where interference occurs or where more desirable accessibility can be obtained or whose materials cannot be installed because of structural or mechanical conditions encountered. Such changes shall be made at no additional cost to the Owner.

1.12 PATENTS

- A. Hold harmless and save the Owner and its officers, consultants, servants and employees from liability of any nature or kind, including costs and expenses for or on account of any copyrighted, patented, or un-patented invention, process, trademark, design, device, material, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.
- B. If the Contractor has information that the process or article specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the

Owner in writing. The contract price shall include all royalties or costs arising from the use of any or all of the above which are, in any way, involved in the contract.

1.13 CONTRACTOR'S WARRANTY

- A. The Contractor represents and warrants:
 - 1. That he is financially solvent and that he is experienced in and competent to perform the types of work or to furnish the plans, materials, supplies or equipment, to be so performed or furnished by him.
 - 2. That he is familiar with all Federal, State, municipal, and department laws, ordinances, orders, and regulations, which may, in any way, affect the work of those employed therein, including, but not limited to, any special acts relating to the work or to the project of which it is a part.
 - 3. That such temporary and permanent work required by the contract as is to be done by him can be satisfactorily constructed and used for the purpose for which it is intended and that such construction will not injure any person or damage any property.
 - 4. That he has carefully examined the plans, specifications, addenda, if any, and the site of the work and that, from his own investigations, he has satisfied himself as to the nature and location of the work, the character, quality, and quantity of materials likely to be encountered, the character of equipment and other facilities needed for the performance of the work, the general and local conditions, and all other materials which may, in any way, affect the work or its performance.
 - 5. That he has satisfied himself as to the existing openings and accesses to the foodservice area through which his equipment shall be required to pass and that he is responsible for his equipment being delivered in as many sections as necessary to conform to the available space dictated by these existing limitations.

1.14 SUBSTITUTIONS

- A. Bids submitted shall be for the specific manufacturer and model, size, capacity, and accessories, as specified or shown on the drawings.
- B. The K.E.C. may quote upon brands and models of equipment other than those specified as a substitute, but he must also bid the primary item. In the event that it is desired to request approval of substitute material, product, article, process, or item of equipment in lieu of that which is specified, submit a written request at the time of submitting bid on a separate sheet attached to, but not part of, the base bid, setting forth the proposed substitution in detail, including an itemized analysis of the addition or deduction in the amount of the contract, if any, which will result if the substitution is approved. Each such request shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation.
- C. The Contractor shall be held responsible for additional costs to himself or any other prime contractor for changes required to install materials, devices, equipment, etc., which the Contractor has substituted for that specified.
- D. The Owner reserves the right to award a contract or contracts based upon the inclusion or exclusion of one or more of the alternate estimates. The description of all workmanship and materials under the various headings of the specifications shall have the same meaning and force when applied to similar workmanship and materials in the alternate. If the descriptions are not specific, the workmanship shall be the best quality and the materials the best commercial grade.

- E. Whenever any product is specified in the Contract Documents by reference to the name, trade name, make, or catalog number of any manufacturer or supplier, the intent is not to limit competition but to establish a standard of quality which is necessary for the project. Products of other manufacturers meeting the established criteria will be considered. However, please take note that the plumbing, electrical, steam, heating, ventilating, and air-conditioning drawings prepared by the consulting engineers, have been engineered based on the first product named under each item number designation. Therefore, any other product which is submitted for approval in lieu of the primary item specified, shall conform to the rough-in requirements established for the first product named, as well as physical size and building construction requirements.
- F. Any equipment listed, which is not in accordance with the provisions of these specifications, will be rejected. If the Contractor fails to submit for approval within the specified time the list of equipment as required herein, the Consultant shall then have the right to make the final equipment selection. The selection made by the Consultant shall strictly conform to these specifications and will be final and binding, and the items shall be furnished and installed by the Contractor without change in the contract price at the time of completion.
- G. It shall be the responsibility of the K.E.C. to prove that substitutions are equal to specified items. **NYIKOS ASSOCIATES, INC.** as the Owner's representative, shall be the determining authority as to the acceptability or equality of the substitutions. <u>No substitutions shall be approved after bids are received.</u>

1.15 DESIGN/MODEL CHANGE, DISCONTINUED ITEMS

- A. All equipment specified shall be of latest design. Any improvements made in design and construction of prefabricated items before equipment is actually delivered to the project site, shall be incorporated in equipment, at no additional cost, provided such incorporation does not delay delivery date of equipment.
- B. In the event of an item being discontinued after specified and prior to delivery to project site, the K.E.C. shall be responsible for notifying the Consultant in writing of the discontinued item and request an alternate of equal performance, including all accessories, at no additional cost to the Owner.

PART 2 PRODUCTS

- 2.1 GENERAL
 - A. The equipment and its component parts shall be new and unused. All items of standard manufactured equipment shall be current models at the time of delivery. All parts subject to wear, breakage, or distortion shall be accessible for adjustment, replacement, and repair.
 - B. Means shall be provided to ensure adequate lubrication for all moving parts. All oil holes, grease fittings, and filler caps shall be accessible without the use of tools.
 - C. The design of the equipment shall be such as to provide for safe and convenient operation. Covers or other safety devices shall be provided for all items of equipment presenting safety hazards. Such guards or safety devices shall not present substantial interference to the operation of the equipment. All guards shall provide easy access to the guarded parts.
 - D. Trim shall not be an acceptable substitute for accuracy and neatness. When trim is required and accepted by the Consultant and the Owner in lieu of rejection of items of equipment, it shall be the K.E.C.'s responsibility to provide same at no additional cost.
 - E. Unless otherwise specified herein, no material lighter than #20 gauge shall be incorporated into the work. All gauges for sheet iron and sheet steel shall be U.S. Standard Gauges, and finished

equipment gauge thickness shall not vary more than 5% plus or minus from the thickness indicated below.

maicated by			
<u>GAUGE</u>	THICKNESS	GAUGE	THICKNESS
#10	0.1406	#16	0.0625
#12	0.1094	#18	0.0500
#14	0.0781	#20	0.0375

F. Materials or work described in words which have a well known and acceptable trade meaning shall be held to refer to such accepted meanings.

2.2 MATERIALS

- A. Refrigeration Systems:
 - 1. Self-contained:
 - a. Whether the units be top-mounted or cabinet-mounted, they shall be started by the K.E.C. and shall be tested for maintenance of temperature.
 - b. All units shall be furnished with condensate evaporators.
 - 2. Remote: Provide and install complete refrigeration system(s), charged, started, and operating properly, according to the Item Specifications and the following.
 - a. Single stage compressors with air-cooled condensers operating within the recommended range of suction discharge pressure of economical operation and within the required capacity.
 - b. All units shall be new and factory assembled, to operate with the refrigerant specified. Refrigerant R-404A shall be used for all medium and low temperature applications. Due to the unsettled nature of refrigerants, no refrigerant shall be used with a phaseout date of less than ten (10) years from the date of installation.
 - c. Compressors shall be accessible hermetic type, Copeland or approved equal, and shall be equipped with high-low pressure control, liquid line drier, sight glass, suction and discharge vibration eliminator, and head pressure control.
 - d. The system shall have a factory mounted and pre-wired control panel complete with main fused disconnect, compressor circuit breakers, contactors, and time clocks wired for single point power connection.
 - e. The supporting frame shall be constructed of structural steel, fully welded, and protected against rust and corrosion with one (1) coat primer, and two (2) coats paint, unless otherwise specified.
 - f. Systems specified for outdoor installation shall be fully protected in a weather-proofed housing with louvered front panel and hinged top, constructed to resist rust and corrosion, and furnished with low ambient controls. Crankcase heater shall be provided with every compressor.
 - 3. Where specifications call for pre-piped lines (i.e., from a fixture to a valve compartment, etc.), provide such work in strict conformance with other sections of the specifications which set forth standards for this type of work or in conformity with the requirements of the Board of Fire Underwriters or ASHRAE Standards, whichever is greater.
 - 4. Each refrigeration item specification is written to provide minimum specifications and scope of work. All refrigeration equipment shall be designed and installed to maintain the following general temperatures unless otherwise specified.

ΤY	PE	REFRIGERATORS	FREEZERS
a.	Walk-In	+35° F./1.7° C.	-10° F./-23.3° C
b.	Reach-In	+35° F./1.7° C.	-10° F./-23.3° C
c.	Undercounter	+35° F./1.7° C.	-10° F./-23.3° C
d.	Fabricated	+35° F./1.7° C.	-10° F./-23.3° C
e.	Cold Pans	+0° F./-17.8° C.	
f.	Work Rooms	+50° F./10° C.	

- 5. Provide (including payment if subcontracted) all electrical and refrigeration components needed by the completed system and complete (or have completed by the respective trades) all connections of and to said components.
- 6. An evaporator coil defrost system shall be provided and installed by the K.E.C. on all refrigeration systems designed to operate at an evaporator coil temperature of less than +35° F. Evaporator coil units provided without electric defrost feature shall be installed with a solenoid valve in the liquid line, controlled by the time clock so as to shut off the flow of refrigerant and allow the compressor to pump down and shut off by activation of the pressure control switch.
- 7. Verify the requirements of and provide any or all additional refrigeration specialty(s) or component(s) required or recommended by the manufacturer for proper operation under the specific operating conditions and location of each system specified.
- 8. Verify and provide manufacturer's certification that the equipment selection hereinafter specified for each refrigeration system is properly sized and shall meet the operating requirements set forth for each system regarding maintaining specified operating temperature, hours of compressor running time, and system pressures and velocities as recommended by the equipment manufacturer(s).
- 9. All refrigeration systems shall be installed and wired in strict conformance with the manufacturer's instructions and recommendations.
- B. Motors and Heating Elements:
 - 1. Motors up to and including 1/2 HP shall be wired for 120 volt, single phase service. Motors larger than 1/2 HP shall be wired for 208 volt, single or three phase service as indicated. Motors shall be of the drip-proof, splash-proof, or totally enclosed type, having a continuous duty cycle and ball bearings, except small timing motors which may have sleeve bearings. All motors shall have windings impregnated to resist moisture. Motors located where subject to deposits of dust, lint, or other similar matter shall be of the totally enclosed type. Motors shall have ample power to operate the machines for which designated under full load operating conditions without exceeding their nameplate ratings. Insulation shall be N.E.M.A. Class B or better.
 - 2. Heating elements having a connected load up to and including 1,000 watts shall be wired for 120 or 208 volt, single phase service, or as indicated on the drawings.
 - a. Any heating element larger than 1,000 watts or any combination of elements in one fixture totaling more than 1,000 watts shall be wired for 208 volt single or three phase service, as indicated on the drawings.
 - b. Fixtures having multiple heating elements may be wired for three phase service with the load balanced as equally as possible within the fixture.
- C. Switches and Controls:
 - 1. Provide recognized commercial grade signals, "on-off" pushbuttons or switches, and other speed and temperature controls as required for operation of each item, complete with pilot lights and permanent graphics, conspicuously labeled, to assist the user of each item.
 - 2. Mount switches and controls directly adjacent the piece of equipment for which it involves, on operator's side of counter body apron, out of view to the public.
 - 3. Provide on or for each motor-driven appliance or electrical heating or control unit, a

suitable control switch or starter of the proper type and rating and in accordance with Underwriter's Code wherever such equipment is not built in. All other line switches, safety cut-outs, control panels, fuse boxes, other control fittings and connections, when not an integral part of the unit or furnished loose by the manufacturer will be furnished and installed by the Electrical Contractor, unless otherwise specified. All electrical controls, switches, or devices provided loose for field installation as a part of the item specified shall be installed in the field by the Contractor unless otherwise specified.

- 4. Appliances shall be furnished complete with motors, driving mechanisms, starters, and controllers, including master switches, timers, cut-outs, reversing mechanisms, and other electrical equipment if and as applicable.
- D. Cover Plates:
 - 1. All controls mounted on vertical surfaces of fixtures shall be set into recessed die stamped stainless steel cups, or mounted onto removable cover plates in such a fashion as to not protrude or interfere with the operation of each item.
 - 2. Cover plates shall be furnished and installed for all electrical outlets, receptacles, switches and controls furnished by the K.E.C., and shall match the material and finish of the equipment to which they will be fastened.
- E. Wiring and Conduit:
 - 1. Wiring shall be properly protected in N.E.M.A. and U.L. approved metal enclosures. Only rigid steel conduit shall be used, zinc coated where unexposed and <u>chrome plated where exposed</u>. All wiring shall be run concealed wherever possible.
 - 2. All equipment furnished under this contract shall be so wired, wound, or constructed so as to conform with the electrical characteristics at the job site.
 - 3. Wiring and connection diagrams shall be furnished with electrically operated machines and for all electrically wired fabricated equipment.
 - 4. Furnish all foodservice equipment completely wired internally using wire and conduit suitable for a wet location. Where an Electrician's services are required, the work shall be done in the K.E.C.'s factory or at his expense at the job site at no additional cost to the Owner. Provide all electrical outlets and receptacles required to be mounted on or in fabricated equipment and interconnect to a master circuit breaker panel with all wires neatly tagged showing item number, voltage characteristics, and load information. Final connection shall be made by the Electrical Contractor.
- F. Cords, Plugs, and Receptacles:
 - 1. The Electrical Contractor shall provide three- or four-wire, grounding-type receptacles for all wall and floor mounted outlets to be used for plug-in equipment with characteristics as noted on the drawings. Provide "Hubbell" three-wire or four-wire grounding-type connectors and neoprene cords installed on each item of plug-in equipment, as indicated on drawings and item specifications.
 - 2. K.E.C. shall coordinate with the Electrical Contractor so that the receptacles provided will match the specific plugs provided as part of the plug-in equipment. Any changes in cords and plugs required in the field due to lack of coordination between the Electrical Contractor and the K.E.C. shall be the latter's responsibility.
 - 3. Reduce the length of all cords furnished with the specified equipment to a suitable or appropriate length so they do not interfere with other equipment or operations.
 - 4. Pedestal receptacles that are part of fabricated equipment exposed to view, shall be similar to T&S Model No. B-1508DD single face, single gang or Model No. B-1528DD single face, double gang.
- G. Water Inlets:
 - 1. Water inlets shall be located above the positive water level wherever possible to prevent

siphoning of liquids into the water supply system. Wherever conditions shall require a submerged inlet, a suitable type of check valve (except in jurisdictions where check valves are prohibited) and vacuum breaker shall be placed on the fixture to form a part of same to prevent siphoning. Where exposed to view, piping and fittings shall be <u>chrome-plated</u>.

- H. Drain Lines:
 - 1. Plumbing Contractor shall provide and install indirect waste lines from equipment which will discharge into floor drains or safe wastes in accordance with Plumbing Rough-In Plans, <u>chrome-plated where exposed</u>. Extend to a point at least 1" (or as required by local codes) above the rim of the floor drain, cut bottom on 45° angle and secure in position.
 - 2. All horizontal piping lines shall be run at the highest possible elevation and not less than 6" above finished floor, through equipment where possible.
 - 3. No exposed piping in or around fixtures or in other conspicuous places shall show tool marks of more than one thread at the fitting.
 - 4. All steam operating valves on or in fabricated and purchased foodservice equipment shall be provided with composition hand wheels, which shall remain reasonably cool in service.
 - 5. Provide suitable pressure regulating valves for all equipment with such components that might reasonably be expected to be affected over a period of time by adverse pressure conditions.
- I. Faucets, Valves and Fittings:
 - 1. All sinks shall be fitted with chromium plated, swing spout faucets of same manufacturer throughout as follows, or otherwise specified in Item Specifications.
 - a. Prep and Utility Sinks:
 - 1.) Splash-Mounted:
 - a.) T&S Brass and Bronze Works, Inc., Model B-231.
 - b.) Fisher Manufacturing Company, Model 3253.
 - 2.) Deck-Mounted:
 - a.) T&S Brass and Bronze Works, Inc., Model B-221.
 - b.) Fisher Manufacturing Company, Model 3313.
 - b. Pot Sinks:
 - 1.) Splash-Mounted:
 - a.) T&S Brass and Bronze Works, Inc., Model B-290.
 - b.) Fisher Manufacturing Company, Model 5214.
 - 2. Pre-Rinse Assemblies:
 - a. Splash-Mounted:
 - 1.) T&S Brass and Bronze Works, Inc., Model B-133 with B-109 wall bracket.
 - 2.) Fisher Manufacturing Company, Model 2210 with 2902-12 wall bracket.
 - b. Deck-Mounted:
 - 1.) T&S Brass and Bronze Works, Inc., Model B-143 with B-510 mixing valve and B-109 wall bracket.
 - 2.) Fisher Manufacturing Company, Model 2810 with 2805-CV mixing valve and 2902-12 wall bracket.
 - 3. Vacuum Breakers:
 - a. General Use:
 - 1.) Fisher Manufacturing Company, Model 3990-8000.
 - b. Disposers:
 - 1.) Splash-Mounted:
 - a.) T&S Brass and Bronze Works, Inc., Model B-455.
 - b.) Fisher Manufacturing Company, Model 3990.
 - 2.) Deck-Mounted:
 - a.) T&S Brass and Bronze Works, Inc., Model B-456.

- b.) Fisher Manufacturing Company, Model 3991.
- 4. Trough Inlets:
 - a. Fisher Manufacturing Company, Model No. 2905.
- 5. Other specialty faucets, pre-rinse assemblies, vacuum breakers, and trough inlets, as specified under Item Specifications.
- 6. All sink compartments shall be fitted with 2" NPT male, chrome-plated, brass rotary waste valves complete with overflow assemblies and stainless steel strainers.
 - a. Prep and General Utility Sinks:
 - 1.) Fisher Manufacturing Company, Model No. 6100.
 - b. Pot Sinks:
 - 1.) Fisher Manufacturing Company, Model No. 6102.
- 7. Refer to Division 22 for all other fittings.
- J. Metals and Alloys:
 - 1. Stainless steel sheets shall conform to ASTM 240, Type 302, Condition A, 18-8, of U.S. Standard Gauges as previously indicated under paragraph 2.1.E.
 - a. All exposed surfaces shall have a No. 4 finish. A No. 2B finish shall be acceptable on surfaces of equipment not exposed to view.
 - b. All sheets shall be uniform throughout in color, finish, and appearance.
 - c. Rolled shapes shall be of cold rolled type conforming to ASTM A36.
 - 2. Stainless steel tubing and pipe shall be Type 304, 18-8, having a No. 4 finish, and shall conform to either ASTM A213 if seamless or ASTM A249 if welded.
 - 3. Where galvanized metal is specified, it shall be copper-bearing galvanized iron, cold-rolled, stretcher leveled, bonderized, re-rolled to insure a smooth surface, and used in the largest possible sizes with as few joints as necessary.
 - 4. Galvanizing shall be applied to rolled shapes in conformance with ASTM A123, and to sheets in conformance with ASTM A526, coating designation G-90.
- K. Castings:
 - 1. Castings shall consist of corrosion resisting metal (white metal) containing not less than 30% nickel. All castings shall be rough ground, polished, and buffed to bright lustre and free from pit marks, runs, checks, burrs, and other imperfections. In lieu of corrosion resisting metal castings, die-stamped or cast 18-8 stainless steel will be acceptable.
- L. Hardware and Casters:
 - 1. All hardware shall be of heavy-duty type, satin finished chromium plated brass, cast or forged or highlighted stainless steel of uniform design. All hardware shall be a well-known brand, and shall be identified by the manufacturer's name and model number for easy replacement of broken or worn parts.
 - 2. Casters on custom-built equipment shall be heavy-duty type, ball bearing, solid or disc wheel, with grease-proof rubber, neoprene, or polyurethane tire. Wheel shall be 5" diameter, minimum width of tread 1-3/16", minimum capacity per caster 250 pounds, unless otherwise noted.
 - a. Solid material wheels are to be provided with stainless steel rotating wheel guard.
 - b. All casters shall have sealed wheel and swivel bearings, polished plated finish and be N.S.F. approved.
 - c. All equipment specified with casters shall have a minimum of two (2) with brakes installed on opposite corners, unless otherwise noted.
- M. Locks:
 - 1. When specified, doors and drawers of all custom fabricated or manufactured equipment shall be provided with cylinder locks, disc tumbler type with stainless steel faceplate as manufactured by Standard-Keil Mfg. Co., or approved equal.

- a. Provide two (2) sets of keys for each lock.
- b. All locks shall be keyed alike, except at cashiers stations or unless otherwise specified.
- N. Thermometers:
 - 1. All fabricated refrigerated compartments shall be fitted with exterior mounted, adjustable, dial or digital thermometers with flush bezels, and shall be calibrated after installation.
- O. Sealants:
 - 1. Sealant, wherever required, shall conform to ASTM C 920; Type S Grade NS, Class 25, Use Nt, with characteristics that when fully cured and washed meets requirements of Food and Drug Administration Regulation 21 CFR 177.2600 and N.S.F. RTV-732 for use in areas where it comes in contact with food.
 - 2. Dow-Corning #780 or General Electric "Silastic", or approved equal, in either clear or approved color to match surrounding surfaces and applied in accordance with sealant manufacturers recommendations for a smooth, sealed finish.
 - 3. VOC content not to exceed 250 g/L.

2.3 FABRICATION AND MANUFACTURE

- A. Materials and Workmanship:
 - 1. Unless otherwise specified or shown on drawings, all materials shall be new, of best quality, perfect, and without flaws. Material shall be delivered and maintained on the job in an undamaged condition.
 - 2. Fabrication shall be equal to the standards of manufacture used by all first class equipment manufacturers, performed by qualified, efficient, and skilled mechanics of the trades involved.
 - 3. All items of standard equipment shall be the latest model at time of delivery.
 - 4. All fabricated work shall be the product of one manufacturer of uniform design and finish.
 - 5. Each fabricated item of equipment shall include all necessary reinforcing, bracing, and welding with the proper number and spacing of uprights and cross members for strength.
 - 6. Wherever standard sheet sizes will permit, the tops of all tables, shelves, exterior panels of cabinet type fixtures, and all doors and drainboards shall be constructed of a single sheet of metal.
 - 7. Except where required to be removable, all flat surfaces shall be secured to vertical and horizontal bracing members by welding or other approved means to eliminate all buckle, warp, rattle, and wobble. All equipment not braced in a rigid manner and which is subject to rattle and wobble shall be unacceptable, and the K.E.C. shall add additional bracing in an approved manner to achieve acceptance.
- B. Sanitary Construction:
 - 1. All fabricated equipment shall be constructed in strict compliance with the standards of the National Sanitation Foundation as outlined in their Bulletin on Food Service Equipment entitled "Standard No. 2" dated October 1952, and in compliance with the local and State Public Health Regulations in which the installation will occur.
 - 2. All fabricated equipment shall bear the N.S.F. "Seal of Approval".
- C. Construction Methods:
 - 1. Welding:
 - a. All welding shall be the heliarc method with welding rod of the same composition as the sheets or parts welded. Welds shall be complete, strong, and ductile with excess metal ground off and joints finished smooth to match adjoining surfaces; free of mechanical imperfections such as gas holes, pits, cracks, etc., and shall be continuously welded so that the fixtures shall appear as one-piece construction. Butt

welds made by spot solder and finished by grinding shall not be acceptable.

- b. Spot welds shall have a maximum spacing of 3". Tack welds shall be of at least 1/4" length, and spaced no greater than 4" from center to center. Weld spacing at the ends of the channel battens shall not exceed 2" centers.
- c. In no case shall soldering be considered as a replacement for welding, nor shall any soldering operation be done where dependence is placed on stability and strength of the joint.
- d. Fixtures shall be shop fabricated of one piece and shipped to the job completely assembled wherever possible. Equipment too large to transport or enter the building in one piece shall be constructed so that the field joints can be welded at the job site.
- e. All exposed joints shall be ground flush with adjoining material and finished to harmonize therewith. Whenever material has been sunk or depressed by welding operation, depression shall be suitably hammered and peened flush with the adjoining surface and ground to eliminate low spots. In all cases the grain of rough grinding shall be removed by successive fine polishing operations.
- f. All unexposed welded joints on undershelves of tables or counters of stainless steel shall be suitably coated at the factory with an approved metallic-based paint.
- g. After galvanized steel members have been welded, all welds and areas where galvanizing has been damaged shall have a zinc dust coating applied in conformance with Military Specification Number MIL-P-26915.
- 2. Joints:
 - a. Butt joints and contact joints, wherever they occur, shall be close fitting and shall not require a filler. Wherever break bends occur, they shall be free of undue extrudence and shall not be flaky, scaly, or cracked in appearance; where such breaks do mar the uniform surface appearance of the material, all such marks shall be removed by suitable grinding, polishing, and finishing. Wherever sheared edges occur, they shall be free of burrs, fins, and irregular projections and shall be finished to obviate all danger of laceration when the hand is drawn over them. In no case shall overlapping materials be acceptable where miters or bullnosed edges occur.
 - b. Field welded joints shall be ground smooth without dips and irregularities and finished to match original finish.
- 3. Bolt, Screw and Rivet Construction:
 - a. All exposed surfaces shall be free from bolt and screw heads. When bolts are required, they shall be of the concealed type and be of similar composition as the metal to which they are applied.
 - b. Where bolt or screw threads on the interior of fixtures are visible or may come into contact with hands or wiping cloths, they shall be capped with a stainless steel or chrome acorn nut and stainless steel lock washer.
 - c. If rivets are used to fasten rear paneling to the body of the fixture, such rivets shall be stainless steel. In no case shall iron rivets be used.
- 4. Sound Deadening:
 - a. Schnee Butyl-Sealant 1/2" wide rope continuously between all frame members and underside of stainless steel table tops, overshelves and undershelves.
 - b. Tighten stud bolts for maximum compression of sealant.
- 5. Hi-Liting:
 - a. All horizontal edges of stainless steel tops, splashes, tops of raised rolled rims, and edges of all exposed doors, handles and shelf edges shall be hi-lited, in uniform design by grinding with abrasive not coarser than #240 grit, then polishing with compound to a uniform mirror finish.
- 6. Polishing:
 - a. The grain of polishing shall run in the same direction on all horizontal and on all

vertical surfaces of each item of fabricated equipment except in the case where the finish of the horizontal sections of each shall terminate in a mitered edge.

- b. Where sinks and adjacent drainboards are equipped with backsplash, the grain of the polishing shall be consistent in direction throughout the length of the backsplash and sink compartment
- 7. Finishes:
 - a. Paint and coatings shall be of an N.S.F. approved type suitable for use in conjunction with foodservice equipment. Such paint or coating shall be durable, non-toxic, non-dusting, non-flaking and mildew resistant, shall comply with all governing regulations, and shall be applied in accordance with the manufacturers recommendations.
 - b. All exterior, galvanized parts, exposed members of framework, and wrought steel pipe where specified to be painted shall be cleaned, primed with rust inhibiting primer, degreased, and finished with two (2) coats of glossy enamel grey hammertone paint, unless otherwise noted.
 - c. Where baked enamel finishes are specified, they shall be oven baked on the fixtures for a minimum of 1-1/2 hours at a minimum temperature of 300° Fahrenheit.
 - d. Fabricated equipment shall be spray coated with plastic suitable for protecting the equipment during transport and installation. The coating shall be easily removable after the equipment installation is complete at the job site, and final clean-up has begun.
- D. Construction:
 - 1. Legs:
 - a. All tubular stands for open base tables, sinks, or dishtables shall have legs constructed of 1-5/8" O.D. stainless steel tubing, with 1-1/4" O.D., #16 gauge stainless steel crossbracing running between legs at a point 10" above finished floor.
 - b. All joints between legs and crossbracing shall be welded and ground smooth, full 360°F.
 - c. The top end of legs shall be closely fitted into fully-enclosed stainless steel conical gussets no less than 3" high, similar to Klein #481-58 or #483-58, or approved equal.
 - d. Gussets shall be fully welded to framing reinforcing members, so that, set screw is not visible from front.
 - e. Legs without crossrails will not be accepted.
 - f. Legs shall be spaced at not more than $5^{-}6^{-}$ on centers, unless otherwise specified.
 - 2. Feet:
 - a. All tubular legs will be swedged for appearance and close fit to United Show Case #BF-158, or approved equal, fully enclosed, stainless steel bullet-shaped foot.
 - 1.) The foot shall be threaded into a collar and completely welded inside the tubular leg to permit a maximum adjustment of 2" without any thread exposure.
 - 2.) Threads shall be National Course Series Class 2 fit or better, machined to prevent end play when foot is at maximum adjustment.
 - 3.) The bullet-shaped foot shall have slightly rounded bottom to protect the floor, and a minimum bearing surface of 3/4" diameter of stainless steel-to-floor contact.
 - 4.) Bottom of tubular leg shall be finished off smoothly to provide a sanitary fitting and prevent the accumulation of grease or other debris.
 - b. Cabinet type fixtures shall be mounted on 8" high die-stamped, sanitary, two-piece stainless steel legs no less than 2-3/4" in diameter at the top, Component Hardware #A72-0811, or approved equal.
 - 1.) The bottom fully enclosed, stainless steel, bullet-shaped foot threads up into the

inside of the upper member, with a male threaded 5/8" bushing to permit maximum adjustment of 2" without thread exposure.

- 2.) The upper section shall be stamped in a neat design with a flared inverted shoulder and fully welded to a base plate designed for anchoring to the channel underbracing.
- 3. Table Tops:
 - a. Tables shall be constructed of stainless steel, and of a thickness not less than #14 gauge with 1-3/4" by 120° rolled edges, or as otherwise specified and detailed.
 - b. All corners shall be bull-nosed and of the same radius as rolled edges.
 - c. Joints where required shall be butt-welded and ground smooth to present a uniform one-piece appearance.
 - d. All tops shall be reinforced on the underside with a fully welded framework of 1-1/2"x1-1/2"x1/8" galvanized steel angles with the framing extending around the top perimeter and crossbraced on 24" maximum centers.
 - e. 1"x4"x1" galvanized or stainless steel, fully welded, cross channel, closed end members placed at each pair of legs with one (1) channel running lengthwise will also be acceptable.
 - f. All tops shall be reinforced so that there will be no noticeable deflection.
 - g. Metal tops where adjacent to walls or other items of equipment, shall be constructed with integral, coved, back and/or endsplashes as required and specified in accordance with the standard details contained herein. Close all ends of splashes.
- 4. Enclosed Bases:
 - a. All enclosed bases or cabinet bodies shall be of seamless #18 gauge stainless steel construction, enclosed on the ends and sides as required and called for under each item.
 - b. Ends of body shall terminate at front or operator's side in a 2" wide mullion, vertical, and completely enclosed. All intermediate mullions shall be completely enclosed.
 - c. The bases shall be reinforced at the top with a framework of 1-1/2"x1-1/2"x1/2"x1/8" galvanized angles, with all corners mitered and welded solid.
 - d. Underside of top shall be reinforced with channels and gussets where necessary. Additional angles and cross members shall be provided to reinforce shelves and support tops under heavy tabletop equipment.
 - e. Where sinks or other drop-in equipment occur, provide additional reinforcing extending crosswise, both sides of opening.
 - f. In the case of fixtures fitting against or between walls, the bodies shall be set in 1" or 2" from the wall line, with the tops continuing to the wall line with integral, coved splashes as specified. Extend vertical face of body to the wall line only. This will permit adjustment to wall irregularities. Vertical trim strips will not be accepted.
 - g. Bodies shall be fitted with counter style stainless steel legs as hereinbefore specified.
- 5. Drawers:
 - a. Drawers, where specified, shall have removable pan inserts of #18 gauge stainless steel, and shall be approximately 20"x20"x5" deep unless otherwise specified.
 - 1.) Perimeter top edge shall be flanged out 1/2".
 - 2.) All interior horizontal corners shall be rounded on a 1" radius, and all interior vertical corners shall be rounded on a 2" radius.
 - b. Fronts shall be double pan #16 gauge stainless steel construction, 1" thick, insulated with a semi-rigid, fiberglass board, unfaced, having a three-pound density.
 - 1.) The top of the drawer face shall be formed as an integral pull by breaking the front pan back on a 45° angle 1", then straight up 1", back to front 1", and then down at the front 3/4".
 - 2.) Drawer front shall have all edges and corners ground smooth with a radius edge

pull.

- 3.) Provide hard rubber button bumpers attached to rear of drawer face at each corner.
- c. The drawer shall have an all welded frame of 1"x1", #16 gauge stainless steel angles sized to fit the removable pan insert.
- d. Drawers shall operate on #14 gauge full-extension slides with stainless steel roller bearings with hardened and ground raceways, Component Hardware, S52 Series, or approved equal. Slides shall be pitched approximately 3/8" per foot to permit self closing action.
- e. Drawers shall be adequately and neatly fitted to the guides to permit easy operation without rattle or binding.
- f. Slides and frame shall be reinforced to support a dead weight of 150 pounds when drawer is fully extended.
- g. Adjustable stops shall be provided for each drawer at the fully-opened position, and be readily liftable by hand for easy removal of drawer.
- h. All drawers not mounted inside a cabinet body shall be completely enclosed in an #18 gauge stainless steel box-type enclosure and suspended from angle framing under the fixture top. The housing bottom shall be flanged and welded to an #18 gauge stainless steel reinforcing channel extending across the open end.
- 6. Sliding Doors:
 - a. Sliding doors shall be of the double pan type, with the exterior pan constructed of #18 gauge stainless steel with all four sides channeled and corners welded. The interior pan shall be similarly constructed of #20 gauge stainless steel, set into the exterior pan, and welded in place.
 - b. All doors shall be insulated with semi-rigid fiberglass board, un-faced, having a threepound density. Styrofoam shall not be acceptable.
 - c. Doors 18" wide or greater, shall have internally welded 4" wide reinforcing channels to prevent warpage.
 - d. Each door shall be fitted with a positive flush-type stainless steel pull, Standard-Kiel #1262-1014-1283 recessed handle, or approved equal.
 - e. In the back of each door install a 1"x1", #16 gauge stainless steel angle stop welded in a suitable location to prevent the doors from overpassing the flush pulls.
 - f. Doors in the closed position shall overlap each other by no more than 2".
 - g. Each door shall be fitted with two (2), 1-3/8" ball bearing sheaves fastened to 1"x1/8" stainless steel bar stock welded to the top corners of each door for suspending on an overhead #16 gauge stainless steel channel track. The hangers shall be tapped for 1/4"-20 thumb screw vertical locks which prevent the doors from jumping the track in operation while permitting easy removal for cleaning without tools.
 - h. Insure that the bottom of the doors are positively and continuously guided to assure proper alignment and passing regardless of the position of each door.
 - i. Provide hard rubber bumpers for doors to close against to insure quiet operation.
- 7. Hinged Doors:
 - a. Hinged doors shall be of the same materials and construction as sliding doors previously specified.
 - b. Hinges shall be heavy duty, stainless steel, removable type, and fastened by tapping into 1/4"x3/4" stainless steel bar stock inside the door pan and behind the door jamb.
 - c. The door face shall be flush with the cabinet body when fully closed.
 - d. Size widths of doors equally when installed in pairs, or in series with other pairs, with no door being greater than 36" in width.
 - e. Doors shall be held closed by permanent magnetic closure devices of an approved type and of sufficient strength to hold the doors shut. Install two (2) per door

(minimum), mounted to the door jamb, top and bottom, with opposing chrome-plated steel plates securely fastened to the inner panel of the doors.

- 8. Undershelves:
 - a. All open base tables shall be provided with full-length undershelves of #16 gauge stainless steel fully welded to legs with all joints ground smooth and polished.
 - b. Front edge shall turn down 1-1/2" and under 1/2".
 - c. Turn up rear and ends 2", with integral coved radius, when specified.
 - d. If required by width, provide 1-1/2"x1-1/2"x1/8" galvanized angle bracing mounted to underside, full length.
- 9. Interior Shelves:
 - a. All interior shelves within cabinet bodies, enclosed bases and overhead cabinets, shall be of #16 gauge stainless steel.
 - b. Removable shelves shall be constructed in equal sections, and rest in 1-1/2"x1-1/2"x1/8" stainless steel angle frame. Cove all horizontal corners in accordance with N.S.F. requirements.
 - c. Stationary shelves shall have 2" turn-up on back and ends, and continuously welded to cabinet body, polished and ground smooth to form a one-piece interior free of any crevices.
 - d. Front edge shall turn down 1-1/2" and under 1/2", and finished with "z" bar forming completely enclosed edge for maximum strength and sanitation.
 - e. Provide 1-1/2"x1-1/2"x1/8" angle bracing mounted to underside, full length.
- 10. Elevated Shelves:
 - a. Shelves over equipment not adjacent to a wall shall be mounted on 1" diameter #16 gauge stainless steel tubular standards neatly fitted with stainless steel base flanges, unless otherwise specified.
 - b. The top of the tubular standards shall be completely welded to #14 gauge stainless steel support channels, full width of overshelf.
 - c. Inside the tubular standard, and welded to same, provide 1/2" diameter steel tension rod extended through countertop and securely anchored to lower framework reinforcing with nuts and lock washers in such a manner as to assure a stable, sway-free structure.
 - d. If required by width, provide 1-1/2"x1-1/2"x1/8" stainless steel angle bracing mounted to underside, full length.
 - e. Cantilevered shelves, when called for, shall be #16 gauge stainless steel supported on #14 gauge stainless steel brackets welded to 1-5/8" O.D. stainless steel tubular standards extending through the backsplash, and fully welded to the table framework. Provide Klein #481-SH welded sleeves where standards penetrate backsplash.
- 11. Wall Shelves:
 - a. Open wall shelves shall be constructed of #16 gauge stainless steel with back and ends turned up 2", positioned 2" out from face of wall, with all corners welded, and supported on #14 gauge stainless steel brackets.
 - b. Brackets shall be flanged inward beneath the shelf and at the wall 1-1/2" with intersecting flanges completely welded, and attached to shelf with studs welded to the underside and bolted with stainless steel lock washers and chrome-plated cap nuts.
 - c. Each bracket shall be fastened to the wall with a minimum of two (2) 1/4"-20 stainless steel bolts anchored securely by means of toggles or expansion shields.
- 12. Sinks:
 - a. All sinks shall be the size and shape as shown on drawings, and constructed of #14 gauge stainless steel with backs, bottoms and fronts formed of one continuous sheet and the ends welded in place.
 - b. Sinks shall have all corners, both vertical and horizontal, coved on a 3/4" radius

electrically welded, ground smooth and polished. Solder in filleted corners will not be acceptable.

- c. Multiple compartment sinks shall be divided with double wall, #14 gauge stainless steel partitions with a 1/2" radius on top and all corners rounded as other corners, continuously welded, ground smooth and polished.
- d. The bottom of each compartment shall be creased to a die stamped recess, tapered and shaped to receive a lever type waste without the use of solder, rivets, or welding.
- e. Provide #14 gauge stainless steel waste lever angle bracket mounted to underside of compartment at front.
- f. The front and exposed ends of sinks shall be fabricated with a 1-1/2", 180 degree rolled edge. The back and ends adjacent to walls or other fixtures shall be turned up with integral coved edge 12" high and returned 2-1/2" at the top on a 45° angle. Cap ends of all exposed splashes.
- g. Unless otherwise specified, two (2) faucet holes on 8" centers shall be provided, located over the centerline of partitions between compartments, 2-1/2" down from splash break.
- h. Gussets for legs shall be fully welded all around to #12 gauge stainless steel triangular plates fully welded to underside of sink.
- i. Sinks fabricated into working surfaces shall be constructed of the same material and in like manner to sinks specified above, except rolled edge and backsplash shall be omitted and the bowl shall be completely welded integral and flush with the working surface. Where basket type wastes are called for, they shall be fitted with removable seats.
- j. Where sink bowls are exposed, the exterior shall also be polished to a #4 finish.
- 13. Sink Drainboards:
 - a. Drainboards shall be constructed of the same material as the sinks and shall be welded integral to same.
 - b. The front portion of drainboards shall continue the 1-1/2", 180° rolled edge of sink bowls on a continuous and level horizontal plane.
 - c. The surface of the drainboard shall pitch from 2-1/2" at the end furthest from the sink, to 3" at the bowl; or 1/8" per foot. In addition, the bottom surface shall be dished toward the center for complete drainage.
 - d. The backsplash of the drainboard shall match the rear of the sink contour and shall be welded integral thereto, running parallel to the floor.
 - e. Drainboards shall be reinforced on the underside with a framework of 1"x4"x1" stainless steel channel underbracing placed at each pair of legs, with exposed ends capped, and one (1) channel running lengthwise.
 - f. Where disposer cones are fabricated into drainboards, additional 1"x4"x1" stainless steel channels shall be welded into the top framing, spanning the drainboard from front-to-back on both sides of the cone and located not more than 3" to either side.
 - g. Disposer control panels or switches shall be supported beneath drainboards, when specified, by means of a #12 gauge stainless steel mounting bracket.
- 14. Dishtable Tops:
 - a. Dishtables shall be constructed of #14 gauge stainless steel with all corners, both vertical and horizontal, coved on a 3/4" radius electrically welded, ground smooth and polished. Solder in filleted corners will not be acceptable.
 - b. Fronts and exposed ends shall be fabricated with a 3" high, 1-1/2", 180° rolled edge with rounded corners. The back and ends adjacent to walls or other fixtures shall be turned up with integral coved edge 12" high and returned 2-1/2" at the top on a 45° angle. Cap ends of all exposed splashes.
 - c. All tops shall slope 1/8" per foot (minimum).

- d. Dishtables shall be reinforced on the underside with a framework of 1"x4"x1" stainless steel channel underbracing placed at each pair of legs, with exposed ends capped, and one (1) channel running lengthwise fully welded between front-to-back channels.
- e. Where tops fit into dishmachines, they shall turn down and into, forming a sealed watertight fit, and attached according to dishmachine manufacturers instructions.
- f. On each side of dishmachine, tables shall be provided with integral splash shields as part of the backsplash.
- g. Silicon filling of gaps caused by poor fit will not be acceptable.
- h. On corner-type door machines, provide #14 gauge stainless steel wall-mounted, splash panel to protect adjacent wall, full width of door opening.
- 15. Cafeteria Style Counters:
 - a. All counters shall be constructed as previously specified under Enclosed Bases.
 - b. Provide top and bottom framing for each counter food pan, cold pan, coffee urn, ice cream unit, ice bin, dish dispenser, etc., whether a drop-in unit or a cutout for a portable unit.
 - c. Where plate shelves occur, frame horizontally 8-1/2" back from counter edge or as design dictates, and at bottom of shelf at counteredge.
 - d. The countertop shall be constructed of #14 gauge stainless steel, as previously specified, with all joints welded, ground and polished.
 - e. Fronts and exposed ends shall be stainless steel, plastic laminate or other material as noted in the Item Specifications.
 - f. All display glass shelving shall be 1/4" polished plate glass and fully trimmed with #18 gauge stainless steel formed channels. Top shelves shall be the same width as the shelf below. Shelves shall be supported on 5/8" square, #16 gauge stainless steel perimeter tubing fully welded to 1-1/4" square, #16 gauge stainless steel tubing uprights.
 - g. Provide appropriate adjustable glass sneeze or breath guards trimmed in stainless steel along front, entire length, mounted in Klein 4465-A brackets.
 - h. Protector shelf over hot food wells shall be #16 gauge stainless steel supported on 1-1/4" square, #16 gauge stainless steel tubing uprights, with 1/4" polished plate glass front and end panels trimmed in #18 gauge stainless steel channels. When specified for self-service, mount bottom edge of front panel 8" above countertop.
 - i. All display and protector shelves shall be furnished with full-length fluorescent lights wired to on/off switch in counter apron, with lamps and protective shields. Conceal all wiring in tubular uprights.
 - j. Refer to Item Specification for changes, as required.
 - k. Counter shall be internally wired complete by the K.E.C., and in such a way as to meet the requirements of the Electrical Code of the job location.

2.4 EQUIPMENT

- A. All items listed on the Contract Documents under the heading "Equipment Schedule" shall be furnished in strict accordance with the foregoing specifications and with the following detailed Itemized Specifications.
- B. Manufacturer's names and model numbers are shown establishing quality, size, and finish required, representing the Owner's and Consultant's requirements and basis for bid. Equipment is listed hereinafter with same item numbers as shown on Contract Documents.

PART 3 EXECUTION

3.1 INSPECTION

- A. Before beginning the installation of foodservice equipment, the spaces and existing conditions shall be examined by the K.E.C. and any deficiencies, discrepancies, or unsatisfactory conditions for proper installation of foodservice equipment shall be reported to the Architect in writing.
 - 1. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner satisfactory to the installer.
 - 2. Beginning installation shall constitute acceptance of the area.

3.2 PREPARATION

- A. Foodservice equipment drawings are diagrammatic and intended to show layout, arrangement, mechanical and electrical requirements.
- B. Field verify all measurements at the building prior to fabrication of custom equipment. Coordinate measurements and dimensions with rough-in and space requirements.

3.3 INSTALLATION

- A. The K.E.C. shall coordinate his delivery schedule with the General Contractor to ensure adequate openings in the building to receive the equipment.
- B. Equipment shall be un-crated, fully assembled and set level in position for final connections. Parts shipped loose but required for connection shall be properly tagged and shall be accompanied by the necessary installation instructions.
- C. Provide a competent, experienced foreman to supervise installation and final connections with other trades.
- D. Remote Refrigeration Systems:
 - 1. All refrigeration work where applicable to this contract shall be accomplished in an approved manner, using finest quality fittings, controls, valves, etc.
 - 2. Refrigeration items shall be started up, tested, adjusted, and turned over to the Owner in first class condition and left running in accordance with the manufacturer's instructions.
 - 3. Refrigeration lines and hook-ups shall be completed by the K.E.C. with the exception of electric, water, and drain line final connections unless otherwise specified.
 - 4. All copper tubing shall be refrigerant grade A.C.R. or type "L".
 - 5. Silver solder and/or Sil-Fos shall be used for all refrigerant piping. Soft solder is not acceptable.
 - 6. All refrigerant lines in pipe sleeves or conduit shall be effectively caulked at ends to prevent entrance of water or vermin and at penetrations through walls or floors.
 - 7. All tubing shall be securely anchored with clamps, and suspended lines shall be supported with adjustable hangers at 6'-0" o.c. maximum.
 - 8. Wrap drain line in freezer compartment(s) with approved heat-tape for final connection by Electrical Contractor.
- E. Sealing and Caulking:
 - 1. Prior to the application of sealant, all surfaces shall be thoroughly cleaned and de-greased.
 - 2. Apply around each unit of permanent installation at all intersections with walls, floors, curbs or other permanent items of equipment.
 - 3. Joints shall be air-tight, water-tight, vermin-proof, and sanitary for cleaning purposes.
 - 4. In general, joints shall be not less than 1/8" wide, with backer rod to shape sealant bead properly at 1/4" depth. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint.

- 5. At internal corner joints, apply sealant or gaskets to form a sanitary cove, of not less than 3/8" radius.
- 6. Provide sealant-filled joints up to 3/4" in joint width. Trim strips for wider joints shall be set in a bed of sealant and attached with stainless steel fasteners, 48" o.c., or less, to insure suitable fastening and prevent buckling of the metals fastened.
- F. Cutting:
 - 1. All cutting, fitting, or patching required during installation shall be accomplished by the K.E.C., at his own expense, so as to make the work conform to the plans and specifications.
 - 2. The K.E.C. shall not cut or otherwise alter, except with the consent of the Owner, the work of any other Contractor.
 - 3. Provide cut-outs in foodservice equipment where required to run plumbing, electric, or steam lines through equipment items for final connections.

3.4 FIELD QUALITY CONTROL

- A. Inspection:
 - 1. Provide access to shop fabrication areas during normal working hours to facilitate inspection of the equipment, during construction, by the Architect or his authorized representative.
 - 2. Errors found during these inspections shall be corrected to the extent required within the scope of the plans, specifications, and approved drawings.
- B. Start-Up and Testing:
 - 1. Delay start-up of foodservice equipment until service lines have been tested, balanced, and adjusted for pressure, voltage, and similar considerations; and until water and steam lines have been cleaned and treated for sanitation.
 - 2. Before testing, lubricate each equipment item in accordance with manufacturer's recommendations.
 - 3. Supply a trained person or persons who shall start up all equipment, test and make adjustments as necessary, resulting in each item of equipment, including controls and safety devices, performing in accordance with the manufacturer's specifications.
 - 4. All gas-fired equipment shall be checked by the local gas company as to calibration, air adjustments, etc., and adjustments made as required.
 - 5. Repair or replace any equipment found to be defective in its operation, including items which are below capacity or operating with excessive noise or vibration.
- C. Demonstration:
 - 1. Provide an operating demonstration of all equipment at a time of Owner's convenience, to be held in the presence of authorized representatives of the Architect and Owner.
 - 2. Demonstration shall be performed by manufacturer's representative knowledgeable in all aspects of his equipment.
 - 3. During the demonstration, instruct the Owner's operating personnel in the proper operation and maintenance of the equipment.
 - 4. Furnish complete, bound, operation/maintenance manuals and certificates of warranty for all items of equipment provided, in accordance with Article 1.5 Submittals, Paragraph F, at this demonstration time.

3.5 ADJUST AND CLEAN

A. Upon completion of installation and tests, clean and sanitize foodservice equipment, and leave in condition ready for use in food service.

- B. Remove all protective coverings, and thoroughly clean equipment both internally and externally with stainless steel cleaner.
- C. Make and check final adjustments required for proper operation of the equipment.
- D. Restore finishes marred during installation to remove abrasions, dents, and other damages. Polish stainless steel surfaces, and touch-up painted surfaces with original paint.
- E. Clean up all refuse, rubbish, scrap materials, and debris caused by the work of this Section, and put the site in a neat, orderly, and broom-clean condition.

3.6 ITEMIZED EQUIPMENT

ITEM #1: FLY FAN

QUANTITY:	One (1)
MANUFACTURER:	Mars Air Doors
MODEL NO .:	N242-1UA-SS (N058)
PERTINENT DATA:	42" Long, Wall-Mounted, Stainless Steel
UTILITIES REQ'D:	1/2HP, 120V, 1PH
ALTERNATE MFRS.:	Berner

Furnish and install per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Accessories:
 - -- Plunger-type micro-switch.
- 2. Attach to wall with expansion bolts centered over door opening.

ITEM #2: SHELVING

QUANTITY:	Two (2)
MANUFACTURER:	InterMetro Industries Corporation
MODEL NO .:	MetroMaxQ (N058)
PERTINENT DATA:	Free-Standing, Open-Grid Polymer Shelf Mat, Adjustable Epoxy-Coated Wire
	Shelves
UTILITIES REQ'D:	
ALTERNATE MFRS.:	None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

Soap Storage:

- 1. Two (2) #MQ1848G sections; 18" W x 48" L x 5-tier high.
- 2. Eight (8) #MQ74PE polymer posts; 74" high.
- 3. Plastic wedge lock connectors, quantity as required.
- 4. Locate bottom shelf @ 12" A.F.F.; space remaining shelves equally.

ITEM #3: MOP SINK & RACK

QUANTITY:	One (1)
MANUFACTURER:	IMC/Teddy
MODEL NO .:	FS (N058)
PERTINENT DATA:	Floor Mounted, Stainless Steel
UTILITIES REQ'D:	1/2" HW, 1/2" CW, 4" W
ALTERNATE MFR:	None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Accessories:
 - -- One (1) #SSF service sink wall faucet.
 - -- Two (2) #MH3 mop holders, total six (6) mops.
 - -- One (1) #HA hose and bracket assembly.
- 2. K.E.C. to furnish #16 gauge stainless steel wall flashing along two (2) walls adjacent sink, 36" high. Attach to wall with non-exposed fasteners and seal to wall and sink.

ITEM #4: WALK-IN COOLER/FREEZER

QUANTITY:One (1)MANUFACTURER:BallyMODEL NO.:Indoor Installation (N058)PERTINENT DATA:4" Thick Urethane Panel - Class I, NSF ConstructionUTILITIES REQ'D:1,300W, 120V, 1PH; (2) 3/4" IWALTERNATE MFRS.:ThermalRite; American Panel; Thermo-Kool

Furnish and install per Equipment Plan, Sheet K101; Building Conditions Plan, Sheet K102; Manufacturer's Shop Drawing and the following:

- 1. Two-Section Unit, 16'-4¹/₂" L x 9'-8" D x 8'-6" H. Interior width: Cooler 7'-2¹/₂", Freezer 8'-2".
- 2. Exterior Finish:
 - -- 26 GA stucco embossed galvanized steel where unexposed.
 - -- 22 GA stucco embossed stainless steel where exposed.
- 3. Interior Finish:
 - -- White .040 stucco embossed aluminum walls.
 - -- White acrylic enamel baked on 26 GA smooth galvanized steel ceiling.
- 4. Interior Floor:
 - -- 4" prefabricated floor panels installed in 6" deep floor recess over hot asphalt paper or 6 MIL polyethylene sheets on building floor slab.
 - -- 2" setting bed with two (2) layers of wire reinforcing mesh fabric and quarry tile floor material with 6" high integral coved base, both interior and exterior of box, installed over prefabricated floor panel by Flooring Contractor.

ITEM #4: (Continued)

- 5. Entrance Door:
 - -- Two (2) flush-mounted, self-closing left-hand hinged doors with 34" x 76" net opening.
 - -- Polished chrome camlift hinges with lift off capability. Provide one (1) extra hinge per door, three (3) total.
 - -- Kason #1236 polished chrome lever-action handle with knob turn release and cylinder lock.
 - -- Kason #09440004 polished chrome dead-bolt lock, factory mounted.
 - -- Hydraulic door closer.
 - -- Mount Kason #1806 LED light fixture centered over door opening to avoid conflict with shelving, each compartment. Extend conduit up in door frame header to junction box mounted on top.
 - -- Standard 2" diameter dial indicating thermometer factory mounted, each compartment.
 - -- Pilot light and switch assembly factory mounted in door frame with stainless steel coverplate.
 - -- 36" high aluminum diamond tread kickplates, interior and exterior of door, frame and jamb.
 - -- 14" x 24" heated observation windows, <u>both</u> entrance doors.
 - -- Undercut doors for quarry tile floor.
 - -- Kason #907 interior door handle, factory mounted, with concealed metal backing plate.
 - -- Round vinyl door bumper mounted to front exterior face to protect handle from puncturing wall when door in full open position.
 - -- Stainless steel heated threshold, both compartments.
 - -- Engraved phenolic plastic compartment signs 12" long x 2" high; white in color with 1" high blue CAPITAL letters mounted on each door above observation window; (1) COOLER, (1) FREEZER.
- 6. One (1) heated pressure relief port in freezer.
- 7. Four (4) Kason #1810L21248LB 48" long twin-tube LED light fixtures with shatter-proof high impact plastic covers centrally-mounted to walk-in ceiling per Detail, Sheet K104, two (2) for the cooler, two (2) for the freezer. Provide low-temperature ballast (-20°F) in freezer lights. Fixtures shipped loose and mounted by K.E.C.; final connection by Electrical Contractor.
- 8. Modularm Corporation Model 75LC recessed digital thermometer with audio-visual temperature alarm factory mounted in door panel and inter-wired with building monitoring system, as required by Electrical Contractor.
- 9. Provide and install trim strips of matching exterior finish between ends of walk-in panels and building walls from finish floor to 6" above finish ceiling; K.E.C. to verify ceiling height.
- 10. Provide and install closure panels of matching exterior finish between top of walk-in and finish ceiling. K.E.C. to verify finished ceiling height.
- 11. All electrical conduit shall be run concealed <u>above</u> walk-in ceiling, per Detail Sheet K104.
- 12. Evaporator coil drain lines shall be run to floor drain with "P"-trap on exterior of box by K.E.C.
- 13. Black flexible "Armaflex" insulation applied to exposed drain lines and fittings within interior of box by K.E.C.
- 14. Spiral heat tape applied to drain line within interior of freezer compartment prior to application of insulation by K.E.C. Drain line heating cable shall be installed for continuous 24-hour operation.

ITEM #4: (Continued)

- 15. Coordinate location of sprinkler system drops and provide penetrations, where necessary.
- 16. Seal and insulate all openings to prevent infiltration of warm air into cooler/freezer compartments.
- 17. Accessories:
 - -- Two (2) Mars Air LoPro #LPN36-IUA air door curtain with optional on/off microswitch. Electrical Contractor to provide power receptacle and final connection. Center fan over each entrance door opening and attach to wall panel with thru-bolts.
- 18. Quality Inspection Requirement:
 - -- Walk-In shall be completely erected at the manufacturer's facility prior to shipment and a quality control inspection performed on the assembled structure. A digital photograph of the assembled walk-in shall be provided for the K.E.C. permanent records and included in the operation and maintenance manuals.

ITEM #5: COOLER REFRIGERATION SYSTEM

QUANTITY:	One (1)
MANUFACTURER:	Bally Refrigerated Boxes, Inc.
MODEL NO .:	BEHA008E6-HS2B (N058)
PERTINENT DATA:	BEH-Line Series, Air Cooled, Outdoor Installation, Remote, With KE2 Therm
	Demand Defrost Controller
UTILITIES REQ'D:	7.3A, 208V, 1PH
ALTERNATE MFRS.:	RDT; Omni-Temp; ColdZone

Furnish and install per Equipment Plan, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. Condensing Unit: Factory Pre-Assembled, Hermetic, Medium Temperature, R-404A.
- 2. System located outdoors on roof. Curb with pitch-pocket furnished and installed by General Contractor. See Roof Plan M1.3 for exact location.
- 3. Complete winterization package and condensing unit weatherproof cover.
- 4. Overall size: 24⁷/₈" L x 30³/₈" W x 16⁷/₈" H.
- 5. Weight: 149 lbs.
- 6. Evaporator Coil with High-Efficiency EC Motors: Low-Profile, End-Mount Type, Model BLP209MA-S1B_ECM; 2.3A, 120V, 1PH
 - -- System to operate at $+35^{\circ}$ F.
 - -- Furnished complete with thermostat, solenoid and expansion valves factory mounted ready for final connection by Refrigeration Contractor.
 - -- KE2 Therm Demand Defrost Electronic Controller with remote monitoring and diagnostics consisting of a microprocessor driven controller, sensors and an optional Electronic Expansion Valve (EEV) factory-installed.
 - -- Furnish Cat5 cable and interwire to building monitoring system by Electrical Contractor.

ITEM #5: (Continued)

- 7. Complete refrigeration system warrantee: five (5) years for the compressor, Two (2) years for the condensing unit, and Two (2) years for all parts of the evaporator coil.
- 8. Factory installed main-fused disconnect switch.

ITEM #6: FREEZER REFRIGERATION SYSTEM

QUANTITY:	One (1)
MANUFACTURER:	Bally Refrigerated Boxes, Inc.
MODEL NO .:	BEHA025L6-HT3B (N058)
PERTINENT DATA:	BEH-Line Series, Air Cooled, Outdoor Installation, Remote, With KE2 Therm
	Demand Defrost Controller
UTILITIES REQ'D:	12.6A, 208V, 3PH
ALTERNATE MFRS.:	RDT; Omni-Temp; ColdZone

Furnish and install per Equipment Plan, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. Condensing Unit: Factory Pre-Assembled, Hermetic, Low Temperature, R-404A.
- 2. System located outdoors on roof. Curb with pitch-pocket furnished and installed by General Contractor.
- 3. Complete winterization package and condensing unit weatherproof cover.
- 4. Overall size: 30³/₈" L x 36³/₈" W x 19⁷/₈" H.
- 5. Weight: 281 lbs.
- 6. Evaporator Coil with High-Efficiency EC Motors: Low-Profile, End-Mount Type, Model BLP209LE-S2B_ECM, 1.2A, 208V, 1PH (Fan); 10.3A, 208V, 1PH (Defrost Heater)
 - -- System to operate at -10° F.
 - -- Furnished complete with thermostat, solenoid and expansion valves factory mounted ready for final connection by Refrigeration Contractor.
 - -- KE2 Therm Demand Defrost Electronic Controller with remote monitoring and diagnostics consisting of a microprocessor driven controller, sensors and an optional Electronic Expansion Valve (EEV) factory-installed.
 - -- Furnish Cat5 cable and interwire to building monitoring system by Electrical Contractor.
- 7. Complete refrigeration system warrantee: five (5) years for the compressor, Two (2) years for the condensing unit, and Two (2) years for all parts of the evaporator coil.
- 8. Factory installed main-fused disconnect switch.

ITEM #7: DUNNAGE RACK, MOBILE

QUANTITY:Four (4)MANUFACTURER:InterMetro Industries CorporationMODEL NO.:Super Erecta (N058)PERTINENT DATA:Open-Grid Shelf Mat, Heavy-Duty, Wire, Metroseal 3TM Epoxy-Coated FinishUTILITIES REQ'D:----ALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

Cooler:

1. Two (2) #MHP33K3 units; 18" W x 36" L.

Freezer:

1. Two (2) #MHP33K3 units; 18" W x 36" L.

ITEM #8: SHELVING, MOBILE

QUANTITY:Eight (8)MANUFACTURER:InterMetro Industries CorporationMODEL NO.:MetroMax i (N058)PERTINENT DATA:Open-Grid Shelf Mat, PolymerUTILITIES REQ'D:----ALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

Cooler:

- 1. Two (2) #MX1836G sections; 18" W x 36" L x 4-tier high.
- 2. Two (2) #MX1842G sections; 18" W x 42" L x 4-tier high.
- 3. Sixteen (16) #MX63UP polymer posts for stem casters, 63" high.
- 4. Eight (8) #5MPX polyurethane swivel casters with bumpers.
- 5. Eight (8) #5MPBX polyurethane swivel casters with brakes and bumpers.
- 6. Plastic wedge lock connectors, quantity as required.
- 7. Locate bottom shelf @ 10" A.F.F.; space remaining shelves equally.

Freezer:

1. Four (4) #MX1842G sections; 18" W x 42" L x 4-tier high.

ITEM #8: (Continued)

- 2. Sixteen (16) #MX63UP polymer posts for stem casters, 63" high.
- 3. Eight (8) #5MPX polyurethane swivel casters with bumpers.
- 4. Eight (8) #5MPBX polyurethane swivel casters with brakes and bumpers.
- 5. Plastic wedge lock connectors, quantity as required.
- 6. Locate bottom shelf @ 10" A.F.F.; space remaining shelves equally.

ITEM #9: SHELVING

QUANTITY:	Eleven (11)
MANUFACTURER:	InterMetro Industries Corporation
MODEL NO.:	MetroMax i (N058)
PERTINENT DATA:	Open-Grid Mat, Free-Standing, Polymer
UTILITIES REQ'D:	
ALTERNATE MFRS.:	None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

Dry Storage:

- 1. Six (6) #MX1848G sections; 18" W x 48" L x 5-tier high.
- 2. Two (2) #MX1860G sections; 18" W x 60" L x 5-tier high.
- 3. Thirty-two (32) #MX74P polymer posts, 74" high.
- 4. Plastic wedge lock connectors, quantity as required.
- 5. Locate bottom shelf @ 10" A.F.F.; space remaining shelves equally.

Non-Food Storage:

- 1. One (1) #MX1842G section; 18" W x 42" L x 5-tier high.
- 2. Two (2) #MX1860G sections; 18" W x 60" L x 5-tier high.
- 3. Twelve (12) #MX74P polymer posts, 74" high.
- 4. Plastic wedge lock connectors, quantity as required.
- 5. Locate bottom shelf @ 10" A.F.F.; space remaining shelves equally.

ITEM #10: SIGNAGE -- (N.I.C. – FURNISHED BY OWNER)

QUANTITY: Two (2)

Furnished by Owner and set-in-place by Contractor per Equipment Plan, Sheet K101 and Manufacturer's Instructions.

ITEM #11: DUNNAGE RACK

QUANTITY:Two (2)MANUFACTURER:InterMetro Industries CorporationMODEL NO.:Super Erecta (N058)PERTINENT DATA:Stationary, With Open-Grid Shelf, Wire, Metroseal 3TM Epoxy-Coated FinishUTILITIES REQ'D:----ALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

Dry Storage:

1. Two (2) #HP35K3 shelf units; 18" W x 48" L.

ITEM #12: PREP SINK

QUANTITY:	One (1)
MANUFACTURER:	Custom Fabricated
MODEL NO:	#14 GA Stainless Steel
PERTINENT DATA:	8'-6" Long x 2'-6" Wide x 2'-10" High
UTILITIES REQ'D:	1/2" HW, 1/2" CW, (2) 2" IW
ALTERNATE MFRS	None

Fabricate and set-in-place per Equipment Plan and Fabrication Detail, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. Front and end edge rolls per Detail 1.02B.
- 2. 13" high backsplash per Detail 1.04A.
- 3. Framework per Detail 1.05.
- 4. Legs per Detail 1.07.
- 5. Crossbracing per Detail 1.10.
- 6. Stainless steel undershelf on both ends per Detail 1.11.
- 7. Sound-deaden underside of sinks and drainboards with NSF-approved sound dampening material.

ITEM #12: (Continued)

- 8 Accessories:
 - -- One (1) T&S #B-0231 backsplash-mounted swing spout faucet with #B-199-1 aerator.
 - -- Two (2) T&S #B-3950-01 twist waste valves with overflow assemblies and #010387-45 basket strainers .
- 9. Item will remain shrink-wrapped until ready for final connection by Plumbing Contractor. Immediately following completion of final connections, K.E.C. shall re-shrink-wrap tubs or provide removable panel to avoid use by construction trades. Post sign on wall above sink tubs in English and Spanish stating: <u>WARNING!</u> NOT TO BE USED BY CONSTRUCTION TRADES. FAILURE TO COMPLY WILL RESULT IN \$500.00 FINE AND ALL COSTS TO REPLACE ITEM WITH NEW.

ITEM #13: HAND SINK

MANUFACTURER:Eagle Foodservice Equipment, Inc.MODEL NO.:HSA-10-FAW-LRS (N058)PERTINENT DATA:Wall Mounted Assembly, With Wrist HandlesUTILITIES REQ'D:1/2" CW, 1/2" HW, 1-1/2" WALTERNATE MFRS.:Advance/Tabco	QUANTITY:	Three (3)
MODEL NO.:HSA-10-FAW-LRS (N058)PERTINENT DATA:Wall Mounted Assembly, With Wrist HandlesUTILITIES REQ'D:1/2" CW, 1/2" HW, 1-1/2" WALTERNATE MFRS.:Advance/Tabco	MANUFACTURER:	Eagle Foodservice Equipment, Inc.
PERTINENT DATA: Wall Mounted Assembly, With Wrist Handles UTILITIES REQ'D: 1/2" CW, 1/2" HW, 1-1/2" W ALTERNATE MFRS.: Advance/Tabco	MODEL NO.:	HSA-10-FAW-LRS (N058)
UTILITIES REQ'D: 1/2" CW, 1/2" HW, 1-1/2" W ALTERNATE MFRS.: Advance/Tabco	PERTINENT DATA:	Wall Mounted Assembly, With Wrist Handles
ALTERNATE MFRS.: Advance/Tabco	UTILITIES REQ'D:	1/2" CW, 1/2" HW, 1-1/2" W
	ALTERNATE MFRS.:	Advance/Tabco

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Complete sink assembly consisting of gooseneck faucet with 0.5 gpm low-flow aerator, p-trap, wrist handles, tailpiece and basket drain.
- 2. Accessories:
 - -- #606215 skirt assembly.
 - -- Left and right end splashes.

ITEM #14: SOAP & TOWEL DISPENSER -- (N.I.K.E.C. – SPECIFIED BY ARCHITECT)

QUANTITY: Three (3)

ITEM #15: EYE WASH STATION

QUANTITY:One (1)MANUFACTURER:Speakman CompanyMODEL NO.:SE-582-ADA (N058)PERTINENT DATA:Wall-Mounted, Dual Aerated Spray Heads with Automatic Flow Control,
Stainless Steel BowlUTILITIES REQ'D:1/2"HW, 1/2" CW, 1-1/2" WALTERNATE MFRS.:T&S Brass

Furnish and install per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

ITEM #15: (Continued)

- 1. Accessories:
 - -- P-trap.
 - -- Flow switch.
 - -- Eye wash station emergency signage.
 - -- Thermostatic mixing valve.
 - -- Scald protection valve.

ITEM #16: PAN RACK CART, MOBILE

QUANTITY:	Two (2)
MANUFACTURER:	CresCor
MODEL NO .:	207-UA-13A (N058)
PERTINENT DATA:	Universal Angles, Channel Posts, (18) 22x20 Pan Capacity
UTILITIES REQ'D:	
ALTERNATE MFR:	InterMetro; Lakeside

Furnish and set-in-place per Equipment Plan, Sheet K101, Manufacturer's Instructions and the following:

- 1. Accessories:
 - -- Full perimeter non-marking wrap-around vinyl bumper.

ITEM #17: WORKTABLE

QUANTITY:	One (1)
MANUFACTURER:	Custom Fabricated
MODEL NO.:	#14 GA Stainless Steel
PERTINENT DATA:	8'-0" Long x 2'-6" Wide x 3'-0" High
UTILITIES REQ'D:	
ALTERNATE MFRS.:	None

Fabricate and set-in-place per Equipment Plan and Fabrication Detail, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. Perimeter edge rolls per Detail 1.02M.
- 2. Framework per Detail 1.05.
- 3. Legs per Detail 1.07.
- 4. Stainless steel undershelf per Detail 1.11.
- 5. Two (2) stainless steel drawer assemblies per Detail 1.14, Type I with locks.
- 6. Worktable per Detail 2.01.
- 7. Sound-deaden underside of tabletop with NSF-approved sound dampening material.
ITEM #17: (Continued)

- 8. Accessories:
 - -- One (1) Edlund #S-11C manual can opener mounted on table.

ITEM #18: POT & PAN SHELVING, MOBILE

QUANTITY:One (1)MANUFACTURER:InterMetro Industries CorporationMODEL NO.:MetroMax i (N058)PERTINENT DATA:Open-Grid Shelf Mat, PolymerUTILITIES REQ'D:----ALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101, Manufacturer's Instructions and the following:

- 1. One (1) #MX2448G shelf section; 24" W x 48" L x 4-tier high.
- 2. Four (4) #MX63UP polymer posts for stem casters, 63" high.
- 3. Two (2) #5MPX polyurethane swivel casters with donut bumpers.
- 4. Two (2) #5MPBX polyurethane swivel casters with brakes and donut bumpers.
- 5. Plastic wedge lock connectors, quantity as required.
- 6. Locate bottom shelf @ 12" A.F.F., space remaining shelves equally.
- 7. Accessories:
 - -- Two (2) #MTR2448XE tray drying racks.
 - -- Ten (10) #MXD24-8 shelf dividers.

ITEM #19: POT WASHING SINK

QUANTITY:	One (1)
MANUFACTURER:	Custom Fabricated
MODEL NO.:	#14 GA Stainless Steel
PERTINENT DATA:	9'-9" Long x 2'-6" Wide x 3'-0" High
UTILITIES REQ'D:	(2) 3/4" HW, (2) 3/4" CW, (3) 2" IW
ALTERNATE MFR.:	None

Fabricate and set-in-place per Equipment Plan and Fabrication Detail, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. Front and end edge roll per Detail 1.02B.
- 2. 13" high back and partial right end splash per Detail 1.04A.

ITEM #19: (Continued)

- 3. Framework per Detail 1.05
- 4. Legs per Detail 1.07.
- 5. Crossbracing per Detail 1.10.
- 6. Stainless steel undershelf on both ends per Detail 1.11.
- 7. Pot sink and drainboards per Detail 3.01.
- 8. Sound-deaden underside of sinks and drainboards with NSF-approved sound dampening material.
- 9. Accessories:
 - -- Two (2) T&S #B-0290 backsplash mounted swing spout faucets.
 - -- Three (3) T&S #B-3950-01 twist waste valves with overflow assemblies and #010387-45 basket strainers .
- 10. Item will remain shrink-wrapped until ready for final connection by Plumbing Contractor. Immediately following completion of final connections, K.E.C. shall re-shrink-wrap tubs or provide removable panel to avoid use by construction trades. Post sign on wall above sink tubs in English and Spanish stating: <u>WARNING!</u> NOT TO BE USED BY CONSTRUCTION TRADES. FAILURE TO COMPLY WILL RESULT IN \$500.00 FINE AND ALL COSTS TO REPLACE ITEM WITH NEW.

ITEM #20: SPARE NUMBER

ITEM #21: BULK MILK COOLER, MOBILE

QUANTITY:One (1)MANUFACTURER:Norlake, Inc.MODEL NO.:GR422WVW/0 (N058)PERTINENT DATA:Self-Contained, 28-Crate CapacityUTILITIES REQ'D:6.4A, 120V, 1PHALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Cylinder door locks.
- 2. Cord and plug set.
- 3. Accessories:
 - -- Warrantee: five (5) year compressor, one (1) year service.
 - -- Four (4) heavy duty 4" diameter swivel casters, front two (2) with brakes.
 - -- Four (4) standard wire shelves with clips.
 - -- Condensate vaporizer with drain line kit.

ITEM #22: WORKTABLE

QUANTITY:One (1)MANUFACTURER:Custom FabricatedMODEL NO.:#14 GA Stainless SteelPERTINENT DATA:6'-0" Long x 2'-6" Wide x 3'-0" HighUTILITIES REQ'D:----ALTERNATE MFRS.:None

Fabricate and set-in-place per Equipment Plan, Sheet K101; Fabrication Detail, Sheet K501; Manufacturer's Shop Drawing and the following:

- 1. Front and end edge roll per Detail 1.02M.
- 2. 6" high backsplash per Detail 1.04A.
- 3. Framework per Detail 1.05.
- 4. Legs per Detail 1.07.
- 5. Stainless steel undershelf per Detail 1.11.
- 6. Two (2) stainless steel drawer assemblies per Detail 1.14, Type I with locks.
- 7. Worktable per Detail 2.01.
- 8. Sound-deaden underside of tabletop with NSF-approved sound dampening material.

ITEM #23: CONVECTION OVEN

One (1)
Blodgett Oven Company, Inc.
MARK V DOUBLE (N058)
Double Section, Standard Depth
(2)11.0KW, 208V, 3PH
None

Furnish and set-in-place per Equipment Plan, Sheet K101, Manufacturer's Instructions and the following:

- 1. Stainless steel front, sides, top and back panels.
- 2. Standard compliment of wire racks, five (5) per section.
- 3. Doors with dual pane thermal windows and interior light package.
- 4. 6" high stainless steel legs with adjustable bullet feet.
- 5. Accessories:
 - -- Blower fan guard.

ITEM #24: EXHAUST CANOPY

QUANTITY:	One (1)
MANUFACTURER:	Captive-Aire Systems, Inc.
MODEL NO:	6630VHB (N058)
PERTINENT DATA:	Stainless Steel, Exhaust Only Canopy
UTILITIES REQ'D:	750 CFM Exhaust; 350W, 120V, 1PH (Lights)
ALTERNATE MFRS.:	Avtec; Gaylord

Furnish and install per Equipment Plan, Sheet K101; Exhaust Canopy Details, Sheet K501; Manufacturer's Shop Drawing and the following:

- 1. 5'-0" long x 5'-6" wide x 2'-6" high, with bottom edge mounted at 6'-8" A.F.F.
- 2. Length comprised of one (1) 5'-0" long section.
- 3. Entire unit constructed of 18 GA stainless steel type 304 with #4 finish on all exposed surfaces with liquid tight all welded external continuous seams and joints.
- 4. One (1) U.L. Listed, NSF-Approved, 36" long twin-tube, recessed LED light fixture, centrally mounted, pre-wired to common junction box. Bulbs furnished and installed by K.E.C.
- 5. On/Off light and fan wall switches furnished and installed by Electrical Contractor.
- 6. Matching stainless steel perimeter closure panels to finished ceiling; K.E.C. to verify ceiling height.
- 7. Hanger rods and support system from structure above by K.E.C.
- 8. Integral stainless steel hanger brackets.
- 9. Accessories:
 - -- #18 gauge stainless steel wall flashing full length of hood to extend from top of finish floor coved base up to bottom edge of hood body. Attach to wall with non-exposed fasteners and seal with clear silicone sealant.

ITEM #25: HEATED TRANSPORT CABINET, MOBILE

Two (2)
InterMetro
C5T-BCPS-12JS (N058)
Insulated, Half-Size, Adjustable Bottom Load Slides, Digital Solid State Controls
With Mobile Power Option, For Baltimore County Public Schools
12.0A, 120V, 1PH
None

Furnish and set-in-place per Equipment Plan, Sheet K101, Manufacturer's Instructions and the following:

- 1. Accessories:
 - #C5T-TRVL travel latch/hasp.

ITEM #26: PASS-THRU REFRIGERATOR, MOBILE

QUANTITY:Two (2)MANUFACTURER:VictoryMODEL NO.:RS-1D-S1-PT-HD (N058)PERTINENT DATA:One-Section, Self-Contained, Stainless Steel Interior/ExteriorUTILITIES REQ'D:9.8A, 120V, 1PHALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Half-height doors hinged per Equipment Plan, both sides.
- 2. Cylinder door locks, keyed-alike.
- 3. Type A/C #16 gauge stainless steel universal angle-type, bottom support pan slides in lieu of wire shelves installed on 3" centers in top compartment, eight (8) pair total; standard wire shelves in bottom compartment, four (4) total, each unit.
- 4. Exterior mounted digital thermometer installed on kitchen side.
- 5. Plastic laminate finish factory applied to door fronts on serving side only, color as selected by Architect; K.E.C. to verify
- 6. 5" diameter heavy-duty swivel casters, two (2) with brakes.
- 7. Cord and plug set.

ITEM #27: PASS-THRU HEATED CABINET, MOBILE

QUANTITY:Two (2)MANUFACTURER:VictoryMODEL NO.:HS-1D-1-PT-HD (N058)PERTINENT DATA:One-Section, Self-Contained, Stainless Steel Interior/ExteriorUTILITIES REQ'D:6.3A, 208V, 1PHALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Half-height doors hinged per Equipment Plan, both sides.
- 2. Cylinder door locks, keyed-alike.
- 3. Type A/C #16 gauge stainless steel universal angle-type, bottom support pan slides in lieu of wire shelves installed on 3" centers, eight (8) pair total; sixteen (16) total, each unit.
- 4. Exterior mounted digital thermometer installed on kitchen side.
- 5. Plastic laminate finish factory applied to door fronts on serving side only, color as selected by Architect; K.E.C. to verify

ITEM #27: (Continued)

- 6. 5" diameter heavy-duty swivel casters, two (2) with brakes.
- 7. Cord and plug with matching receptacle furnished and installed by Electrical Contractor.

ITEM #28: ICE CREAM CABINET, MOBILE

QUANTITY:One (1)MANUFACTURER:Global RefrigerationMODEL NO.:6DF (N058)PERTINENT DATA:14.1 Cu. Ft. Capacity, Stainless Steel Top, White Painted Cabinet, Hinged LidsUTILITIES REQ'D:4.5A, 120V, 1PHALTERNATE MFRS.:Master-Bilt

Furnish and set-in-place per Equipment Plan, Sheet K101, Manufacturer's Instructions and the following:

- 1. Accessories:
 - -- Lid locking device.
 - -- One (1) set of four (4) 3" diameter casters with heavy duty bracket.
- 2. Cord and plug set.

ITEM #29: MILK COOLER, MOBILE

QUANTITY:Two (2)MANUFACTURER:Beverage AirMODEL NO.:SMF34Y-1-S (N058)PERTINENT DATA:34" Wide, Single Access, 8-Case Capacity, Forced-Air TypeUTILITIES REQ'D:4.2A, 120V, 1PHALTERNATE MFRS.:None

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Stainless steel exterior and interior finish.
- 2. Cord and plug set.
- 3. Cylinder lid lock.
- 4. Swivel casters.
- 5. Accessories:
 - -- #00C01-012A-01 corner bumper kit, each unit.
 - -- Custom laminate finish to match serving counter.

ITEM #30: SPARE NUMBER

ITEM #31: SERVING COUNTER

QUANTITY:	One (1)
MANUFACTURER:	The Delfield Company
MODEL NO .:	Shelleyglas Modular Sections, BCPS Prototype Specifications (N058)
PERTINENT DATA:	Straight Line Configuration, #14 GA Stainless Steel Tops, One Piece Continuous
	Tray Slide
UTILITIES REQ'D:	80.0A (Service) 120/208V, 1PH (Single-Point- Connection)
ALTERNATE MFR.:	ColorPoint by Low-Temp Industries

Refer to individual counter components listed under alpha headings for specification.

ITEM #31A: HOT FOOD COUNTER

QUANTITY:	Two (2)
MANUFACTURER:	Shelleyglas by The Delfield Company
MODEL NO .:	KH-5-NU (N058)
PERTINENT DATA:	Open Base, Five (5) Wells, With Drains
UTILITIES REQ'D:	40.0A, 120/208V, 1PH, 1/2" HW, (5)3/4" IW
ALTERNATE MFRS.:	ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. (A) 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front and mitered corner mounted on rigid brackets @ 29" A.F.F.
- 2. (E) 6" wide full-length fold-down stainless steel plate shelf on server's side.
- 3. (G) Sloped front food protector with tempered glass front and fixed end panels.
- 4. (M) Radiant heat lamp with incandescent lights and on/off switch.
- 5. (F) Line-up interlock for counter body.
- 6. (QQ) Food wells with individual drains and quarter-turn ball valves piped independently to isolated compartment within counter base on end opposite Item #31B with stainless steel hinged access door per Detail, Sheet K103.
- 7. (P) Open understorage with bottom stainless steel shelf.
- 8. (V) 6" high stainless steel legs with adjustable bullet feet.
- 9. U.L. Listed straight blade cord and plug set.
- 10. Standard counter height of 36" A.F.F. turn end down to align and interlock with adjacent frost top counter.
- 11. All components pre-wired to load center located in Item #31B: Frost Top Counter.

ITEM #31A: (Continued)

- 12. Exterior body color as selected by Architect; K.E.C. to verify.
- 13. Accessories:
 - -- T&S #B-0101-A96 pre-rinse spray with aerator and pull-out 96" long flexible hose mounted on end opposite Item #31B: Frost Top Counter. Furnish counter top with stainless steel escutcheon plate to hold pre-rinse spray.

ITEM #31B: FROST TOP COUNTER

QUANTITY:	Two (2)
MANUFACTURER:	Shelleyglas by The Delfield Company
MODEL NO.:	KCFT-60-NU-MOD (N058)
PERTINENT DATA:	Mechanically Refrigerated, Open Base
UTILITIES REQ'D:	8.0A, 120V, 1PH; 3/4" IW
ALTERNATE MFRS.:	ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. (A) 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front mounted on rigid brackets @ 29" A.F.F.
- 2. (G) Sloped front food protector with tempered glass front and fixed end panels. Provide reducedheight front adjustable panel for self-service.
- 3. (L) Fluorescent light fixtures.
- 4. (F) Line-up interlock for counter body.
- 5. (P) Open understorage with bottom stainless steel shelf.
- 6. (V) 6" high stainless steel legs with adjustable bullet feet.
- 7. Cord and plug set.
- 8. Modified counter height of 30" A.F.F.
- 9. Modify length of frost top and food protector to provide an opening adjacent to Item #31A: Hot Food Counter for clear passage of 10"x12" tray.
- 10. Modified frost top recessed 1" and sized to accept 18"x26" sheet pan.
- 11. Provide drain line <u>less</u> shut-off valve. Plumber to extend copper drain line to nearest floor sink.
- 12. Exterior body color as selected by Architect; K.E.C. to verify.
- 13. All components pre-wired to load center with hinged access door.

ITEM #31C: SOLID TOP COUNTER

QUANTITY:Two (2)MANUFACTURER:Shelleyglas by The Delfield CompanyMODEL NO.:KC-28-NU (N058)PERTINENT DATA:28" Long, Open BaseUTILITIES REQ'D:----ALTERNATE MFRS.:ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. (A) 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front mounted on rigid brackets @ 29" A.F.F.
- 2. (F) Line-up interlock for counter body.
- 3. (P) Open understorage with bottom stainless steel shelf.
- 4. (V) 6" high stainless steel legs with adjustable bullet feet.
- 5. Modified counter height set @ 30" A.F.F.
- 6. Provide cut-out in top for Item #32: Ice Cream Display Merchandiser. Counter base shall have isolated compressor housing with louvered stainless steel removable access panel and remote on/off compressor switch, operator's side.
- 7. Exterior body color as selected by Architect; K.E.C. to verify.
- 8. All components pre-wired to load center located in Item #31B: Frost Top Counter.

ITEM #31D: CASHIER STAND

QUANTITY:One (1)MANUFACTURER:Shelleyglas by The Delfield CompanyMODEL NO.:KCS-50-MOD (N058)PERTINENT DATA:50" LongUTILITIES REQ'D:15.0A (Dedicated Circuit), 120V, 1PHALTERNATE MFRS.:ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. (A) 10" wide full-length flat surface one-piece solid stainless steel tray slide with marine edge front mounted on rigid brackets @ 29" A.F.F.
- 2. (F) Line-up interlock for counter body.
- 3. (Q) Two (2) 15A convenience outlets mounted below top in counter body. Provide die-raised opening in top for power cord access.

ITEM #31D: (Continued)

- 4. Two (2) cashier's utility drawer assemblies with locking provision mounted side by side.
- 5. (P) Open understorage with bottom stainless steel shelf open to server's side. Provide stainless steel overshelf below cashier's drawer in lieu of footrest.
- 6. (V) 6" high stainless steel legs with adjustable bullet feet.
- 7. Cord and plug set.
- 8. Modified counter height of 30" A.F.F.
- 9. Exterior body color as selected by Architect; K.E.C. to verify.
- 10. All components pre-wired to load center located in Item #31B: Frost Top Counter.

ITEM #32: ICE CREAM DISPLAY MERCHANDISER

QUANTITY:Two (2)MANUFACTURER:Silver KingMODEL NO.:SKCTMDI (N058)PERTINENT DATA:Drop-In, Hinged LidUTILITIES REQ'D:2.7A, 120V, 1PHALTERNATE MFRS.:ColorPoint by Low-Temp Industries

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Instructions and the following:

- 1. Accessories: -- #10315-08 lock bar kit, each unit.
- 2. Cord and plug set.

ITEM #33: CASH REGISTER -- (N.I.C. – FURNISHED BY OWNER)

QUANTITY: Two (2)

ITEM #34: CONDIMENT COUNTER, MOBILE

QUANTITY:	Two (2)
MANUFACTURER:	Shelleyglas by The Delfield Company
MODEL NO .:	KC-36-NU (N058)
PERTINENT DATA:	Storage Base, 36" Long, #14 Gauge Stainless Steel Top
UTILITIES REQ'D:	
ALTERNATE MFR.:	ColorPoint by Low-Temp Industries

ITEM #34: (Continued)

Furnish and set-in-place per Equipment Plan, Sheet K101; Manufacturer's Shop Drawing and the following:

- 1. (A) 10" wide full-length fold-down solid stainless steel tray slide mounted @ 29" A.F.F..
- 2. Enclosed understorage base with bottom stainless steel shelf and stainless steel hinged doors with cylinder lock.
- 3. Modified counter height of 30" A.F.F.
- 4. Four (4) 5" diameter heavy-duty swivel casters, all four (4) with brakes.
- 5. Exterior body color as selected by Architect; K.E.C. to verify.

ITEM #35: UTILITY CART, MOBILE

QUANTITY:Two (2)MANUFACTURER:InterMetro Industries CorporationMODEL NO.:MXUC2436G-25 (N058)PERTINENT DATA:Metromax, Polymer, 24" x 36" Shelf Size, Two-ShelfUTILITIES REQ'D:----ALTERNATE MFRSNone

Furnish and set-in-place per Equipment Plan, Sheet K101 and Manufacturer's Instructions.

(END OF FOODSERVICE ITEMIZED SPECIFICATIONS)

STANDARD DETAILS

STANDARD DETAILS



NOTE! JOINED SECTIONS SHALL BE DRAWN TOGETHER LEAVING ONLY A HAIRLINE SEAM.

A. BOLT DRAWN JOINT



NOTE! ON FIXTURES SPECIFIED WITH WELDED FIELD JOINTS, WELDS SHALL BE CONTINUOUS, GROUND & POLISHED LEAVING NO VISIBLE EVIDENCE OF WELD.

B. WELDED BUTT JOINT



NOTE! JOINED SECTIONS SHALL BE DRAWN TOGETHER LEAVING ONLY A HAIRLINE SEAM.

C. RAISED CAP SEAM - KNUCKLE JOINT









ANYIKOS ASSOCIATES, INC. Food Facilities Design/Consulting

BACKSPLASHES





- a. FULLY WELDED CONSTRUCTION.
- b. ANGLE LOCATION ENDS; SIDES OF TOP INSETS; INTERMEDIATES 24" ON CENTER.
- c. CHANNEL LOCATION ENDS AND INTERMEDIATE MAXIMUM 6'-6" O.C.
- d. ADD CENTER CHANNEL WHEN DRAINBOARD LENGHT EXCEEDS 2'-6".
- e. SECURE TOP TO FRAMEWORK WITH WELDED STUDS, S/S LOCKWASHERS AND CAP NUTS.
- f. CLOSE CHANNEL AT FRONT ONLY.



TABLE & DRAINBOARD

FRAMEWORK





NYIKOS ASSOCIATES, INC.
Food Facilities Design/Consulting

TABLE & SINK LEGS

DESCRIPTION:

STANDARD DTL: 1.07 PAGE: 114000-52



a. FULLY WELD, GRIND SMOOTH AND POLISH.



DESCRIPTION:

	STANDA
CROSSBRACING	1.
	PAGE:
	1140





- a. FULLY WELD, GRIND SMOOTH AND POLISH.
- b. WHEN SPECIFIED, TURN REAR AND ENDS UP 2".











- e. DRAINBOARDS UP TO 24" IN LENGTH REQUIRE NO LEGS OR BRACES. DRAINBOARDS 25" TO 30" REQUIRE I" O.D. 16 GA. S/S BRACE. DRAINBOARDS OVER 30" REQUIRE LEGS AND CHANNEL FRAMEWORK.
- f. DRAINBOARDS SHALL PITCH TO SINK 1/8" PER FOOT OF LENGTH TO PROVIDE COMPLETE DRAINING WITHOUT POOLING. THE 3" HIGH RAISED ROLLED RIM AT THE SINK SHALL DECREASE IN HEIGHT TOWARD THE OUTER ENDS OF THE DRAINBOARD.
- g. PARTITIONS BETWEEN COMPARTMENTS TO BE DOUBLE WALLED CONSTRUCTION WITH ROUNDED TOP, ALL WELDED INTEGRAL WITH SINK BODY.
- h. BACK, BOTTOM, AND FRONT SHALL BE ONE CONTINUOUS PIECE WITH ENDS WELDED INTEGRAL, WITHOUT OVERLAPPING JOINTS OR OPEN SPACES, BETWEEN COMPARTMENTS.
- i. WASTES SHALL BE SEATED IN DIE STAMPED DEPRESSIONS WITHOUT USE OF SOLDER, RIVETS OR WELDING. INSTALLED COMPONENTS SHALL BE FLUSH WITH SURROUNDING SURFACE.
- j. EACH SINK COMPARTMENT TO BE PITCHED AND CREASED TO WASTE TO ASSURE COMPLETE DRAINING WITHOUT POOLING.
- k. ENTIRE UNIT SHALL BE ALL WELDED COVE CORNERED CONSTRUCTION WITH VERTICAL AND HORIZONTAL AND INTERIOR CORNERS HAVING A 3/4" RADIUS.
- 1. STD.- 1.02 b EDGE.
- m. STD. 1.04a. BACKSPLASH.
- n. UNDERSIDE OF DRAINBOARDS AND SINKS TO BE SPRAYED WITH SOUND DAMPENING IN COMPLIANCE WITH N.S.F. STD. 2 PARA 4.441 WHEN SPECIFIED.
- 0. FAUCETS T&S MODEL B-232 WITH AERATOR B-199, REMOVABLE MONEL SEATS AND 1/2" I.P.S. MALE INLETS.
- P. WASTES 2" NICKEL PLATED BRONZE ROTARY HANDLE WASTE S/S STRAINER PLATE WITH CHROME WITH CHROME PLATED BRASS CONNECTED OVERFLOW, STAN-DARD- KIEL HARDWARE MFG. CO. #1770-1015-1000.
- q, REAR CROSS BRACING ONLY.
- r. OMIT FRONT AND REAR LENGTHWISE CROSSBRACIG UNDER SINKS.

DESCRIPTION:

- s. 12 GAUGE STAINLESS STEEL 6"x 6" TRIANGULAR SUPPORT PLATE WELDED TO UNDERSIDE OF SINKS.
- t. WIDTH AS SPECIFIED.

(END OF SECTION 114000)



SINK AND DRAINBOARDS

SECTION 11 51 23 - LIBRARY STACK SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Modular wood library shelving system.

1.2 SUBMITTALS

- A. Product Data: For each type of library shelving system and accessory specified. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- B. Shop Drawings: Show plans, elevations, ends, cross-sections, and installation and anchorage details.
- C. Samples: Of each exposed product and for each color and finish required, 6 inches square.
- D. LEED Submittals:
 - 1. Product data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of pre-consumer and post-consumer recycled content. Include statement indicating cost of each product with recycled content.
 - 2. Product data for Credit MR 7: For all new wood, submit vendor invoices. For FSC certified new wood, submit FSC Chain-of-Custody certificates indicating compliance with forest certification requirements and vendor invoice indicating Chain-of- Custody.
 - 3. Product data for Credit IEQ 4.4: For composite wood and laminating adhesives, documentation indicating no added urea formaldehyde resins.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide shelving and accessories manufactured by the same manufacturer.
- B. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify library shelving system placement by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work. Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating shelving system without field measurements. Coordinate work of other contracts to ensure actual installation dimensions correspond to established dimensions.
- B. Space Enclosure and Environmental Limitations: Do not install library shelving until spaces are enclosed and weatherproof, wet-work in spaces is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are being maintained at the levels indicated for Project when occupied for its intended use.

1.5 COORDINATION

A. Coordinate layout and installation of shelving with work of other contracts.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Drawings indicate the catalog numbers of library shelving units by manufacturer indicated, which are representative products used to establish a standard of design and quality required. Subject to compliance with requirements, provide Pin-Fast Wood & Steel Shelving; by The Worden Company, or a comparable product by one of the following:
 - 1. Brodart Co.
 - 2. Library Bureau.
 - 3. Russwood Library Furniture.

2.2 WOOD LIBRARY SHELVING

- A. Wood Shelving: Modular type, with starter and adder units, 36 inches on center of uprights, complying with the following:
 - 1. End Panels: 1-inch thick, 5-ply lumber core, exposed vertical edges banded with matching solid hardwood with square eased edges. Provide vertical rows of holes drilled near the front and rear of each panel for shelf adjustment on 1-inch centers. Attach tops and bases to end panels with 5/16-inch 18 x 3-inch hex-head bolts and washers. Do not use lag bolts or wood screws.
 - 2. Intermediate Uprights: 3/4-inch thick, solid maple hardwood glued up in flush panel design with square edges. Provide random width boards, no more than 4 inches or less than 1-inch. Stagger pin holes on both sides of panel to avoid coinciding with holes on opposite side. Drill panels through front and rear, top and bottom, for attachment of tops and bases with 5/16-inch 18 x 3-inch hex-head bolts, nuts and washers.
 - 3. Cornice Tops: 2-1/4-inch fascia, 3/4 inches thick of solid maple banded to 3/4-inch plywood panel. Provide 1/8-inch radius to top front corner of fascia. Butt a solid hardwood bolting cleat 2-1/4 by 1-1/4 inches glued and stapled to inside surface of top at each end.
 - 4. Base: ¹/₂-inch solid maple, 4 inches high. Provide a 2 by 3/4 inch rail tenoned full-length to the inside front. Provide bolting cleats 2-1/4 by 1-1/4 inches glued and stapled at ends of rail and drilled to allow assembly bolts to pass through. Provide second full-length rail at rear of bolting cleats for support and proper alignment.
 - 5. Shelves: 3/4-inch thick, solid hardwood wit 2-inch nosing of solid maple. Provide random widths no more than 4 inches or less than 1-inch. Groove shelves 11/32 inches in diameter half round on underside of shelves to set firmly on 1-inch long, 5/16-inch diameter cadmium-plated and threaded shelf pins.
 - 6. Backs and Partitions: 1/4-inch plywood to match shelving. Provide backs finished on one side for single-faced shelving. Provide partitions finished on both sides for double-faced shelving.
- B. Wood Species and Cut for Exposed Surfaces: Clear maple, plain sliced.
- C. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body. All non-FSC wood in assemblies with FSC-certified wood shall meet the FSC Controlled Wood (CW) criteria.
- D. Composite Wood and Laminating Adhesives (shop and field applied): Contain no added urea formaldehyde resins.

2.3 ACCESSORIES

A. Shelf Label Holders: Plastic, for card size 5/8 by 5 inches.

B. Special Shelves: Provide special shelving units for the following as required:1. Storybook Shelving.

2.4 FINISHES, GENERAL

- A. 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 unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- 2.5 WOOD FINISHES
 - A. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards," Section 1500 requirements for factory finishing.
 - B. Shop Finishing: Finish wood components at the fabrication shop. Defer final touchup, cleaning, and polishing until after installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for conditions affecting performance of library shelving system.
- B. Examine areas for suitable conditions where library shelving is to be anchored.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install library shelving system level, plumb, square, and true with integral adjustable leveling devices. Using shims shall not be permitted. Install to a tolerance of 1/8 inch in 96 inches for level and plumb shelves.
- B. Anchor single-faced ranges to wall construction by method recommended by manufacturer.

END OF SECTION

SECTION 11 52 13 - PROJECTION SCREENS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Rear projection screen assemblies.
- 1.2 RELATED REQUIREMENTS
 - A. Section 06 10 00 Rough Carpentry: Wood blocking in walls and ceilings.
 - B. Division 26 Sections for electrical service and connections including metal device boxes for switches and conduit, where required, for low-voltage wiring.

1.3 DEFINITIONS

A. Gain of Front-Projection Screens: Ratio of light reflected from screen material to that reflected perpendicularly from a magnesium carbonate surface as determined per SMPTE RP 94.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog cuts and descriptive information 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: Show layouts and types of projection screens. Include the following:
 - 1. Location of screen centerline relative to ends of screen case.
 - 2. Location of wiring connections.
 - 3. Location of seams in viewing surfaces.
 - 4. Drop length.
 - 5. Connections to supporting structure for pendant- and recess-mounted screens.
 - 6. Anchorage details.
 - 7. Details of juncture of exposed surfaces with adjacent finishes.
 - 8. Accessories.
 - 9. Wiring Diagrams: For electrically operated units.
- D. Samples: For case and frame finishes, submit two 2 by in size, illustrating color and texture of finish.
- E. Operation and Maintenance Data: Provide manufacturer's operation and maintenance instructions.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of projection screen through one source from a single manufacturer. Obtain each screen as a complete unit, including necessary mounting hardware and accessories.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver projection screens to project site in manufacturer's original unopened packaging. Inspect for damage and size before accepting delivery.
- B. Do not deliver projection screens until building is enclosed and other construction within spaces where screens will be installed is substantially complete and ready for screen installation.
- 1.7 COORDINATION
 - A. Coordinate layout and installation of projection screens with adjacent construction, including ceiling framing, light fixtures, HVAC equipment, and partitions.

PART 2 PRODUCTS

2.1 REAR PROJECTION SCREENS

- A. Manufacturers:
 - 1. Basis-of-Design: Da-Lite Screen Company; Tensioned Large Advantage Electrol Screen, Model 70248-L: www.da-lite.com.
 - 2. Draper, Inc: www.draperinc.com.
- B. Exposed Screen Cases: Steel or Aluminum; integral roller brackets.
 - 1. Tensioned System.
 - a. Screen Operation: Electrically operated, UL and ULC listed, retractable, heavy duty, with rigid metal roller and motor housed within the roller. Tab guide cable tensioning system to maintain even, lateral tension and hold viewing surface flat. Bottom end of fabric to be inserted into a custom aluminum slat bar with added weight to provide vertical tension on the screen surface.
 - 1) Motor: Single motor, UL and ULC certified, 3-wire permanently lubricated reversal-type, attached to header, with preset adjustable limit switches to automatically stop viewing surface in UP or DOWN position. Includes automatic thermal overload protection, integral gears, capacitor and electric brake to prevent coasting.
 - (a) Voltage, Frequency: 115 V, 60 Hz.
 - (b) Amperage: 2.4 amps.
 - (c) Limit Switches: Preset and adjustable to automatically stop viewing surface in UP or DOWN position.
 - (d) Provide wireless control in addition to wall mounted switch.
 - (e) Housing: Inside metal roller.
 - b. Screen Mounting: Suspended from Pipe Grid.
 - c. Screen Case: Designed to receive mounting hardware and sized to suit projection screen.
 - 1) Material: Single piece extruded aluminum.
 - 2) Case Finish:
 - (a) Powder coated black.
 - (b) Hinged, automatically operated black screen closure door on case bottom.
- C. Rear Projection Screen Fabric: Translucent; washable; flame retardant and mildew resistant.
 - 1. Basis-of-Design Fabric Material: Vinyl fabric without backing, with nominal gain of 0.9 on axis, Half Angle of 65 degrees, Product Da-Lite Dual Vision.

- 2. Screen Drop: Length as required to place viewing area in location indicated on the drawings.
- 3. Color: White.
- 4. Size: As indicated on the drawings.
- 5. Screen Viewing Area: 110 inch high x 176 inch wide.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate is finished and ready to accept screen installation.
- B. Do not install projection screens until climate control systems are in place and interior painting and other finishes are completed.

3.2 PREPARATION

- A. Coordinate screen installation with installation of projection systems.
- B. Coordinate installation with adjacent construction and fixtures, including ceilings, walls, lighting, fire suppression, and registers and grilles.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.
- B. Do not field cut screens.
- C. Install screens in mountings as specified and as indicated on drawings.
- D. Install plumb and level when screen is lowered.
- E. Adjust projection screens and related hardware in accordance with manufacturer's instructions for proper placement and operation.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 11 61 42 - PLATFORM CURTAINS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes curtains, track, carriers, pipe grid and accessories.
- B. Section includes the following types of Stage curtains.
 - 1. Front curtain.
 - 2. Video production curtain.
 - 3. Teaser and Border.
 - 4. Cyclorama.
 - 5. Pipe Grid.

1.2 DESIGN REQUIREMENTS

- A. Mill seconds and imperfect runs of mill seconds will be rejected.
- B. Fire Performance Characteristics:
 - 1. Supply fabric manufacturer's flameproof certificates at the time of invoice for all fabrics specified and selected; fabrics must be flameproof in accordance with requirements of state and local bureaus having jurisdiction.
 - 2. If fabrics are not inherently flame retardant then an applied flame spread treatment must be added; the drapery fabricator is responsible for this procedure at no additional cost to the Owner.
 - 3. Provide curtains that are certified to be flame resistant according to requirements of NFPA 701; permanently attach label to each curtain indicating whether curtain is permanently and inherently flame resistant or whether it will require re-treatment after dry cleaning.
- C. Support Platform curtain items that are to be installed in a fixed position from a system of parallel pipe battens, and a single pipe batten shall correspond to each item, whether the item is a drapery that is tied directly to its corresponding pipe batten, or whether the item is a track that is located between the pipe batten and the drapery, or whether the item supported is some other piece of equipment; fasten hardware to the pipe battens by means of pipe clamps or trim chains.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate end track location, width of opening, location of blocking for anchors, appurtenances and interferences, adjacent construction, operating hardware, and support bracket details.
- B. Product Data: Submit track profiles, shapes, acceptable load data and finishes.
- C. Samples:
 - 1. Submit samples for initial selection purposes in form of fabric manufacturer's standard color card.
 - 2. Curtain and Lining Material: Minimum 36 x 36 inches of each color or pattern selected.
 - 3. Drapery Track: Minimum 18 inches long.
 - 4. Bottom and side hem intersection (include weights).
- D. Maintenance Data: Dry-cleaning or laundering instructions; include precautions in use of cleaning materials which may be detrimental to the surface if improperly applied.
- E. Surface Burning Characteristics: NFPA 701 small-scale vertical burn test.

- F. Certificates:
 - 1. Submit certification from a corporate officer of the manufacturer with the sample submissions.
 - 2. The certificate is required to include data and test ratings for physical properties specified.
 - 3. Architect reserves the right to perform similar tests.

1.4 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Firm experienced in producing Platform curtains similar to those indicated for this Project that have a record of successful in-service performance with minimum five years experience.

1.5 PROJECT CONDITIONS

- A. Review the Drawings and Project Manual and visit the site before manufacturing, in order to field check conditions and to take accurate measurements; show recorded measurements on final shop drawings.
- B. Verify field measurements are as indicated on shop drawings.
- C. Supply and properly install equipment and miscellaneous items necessary for a proper installation of the Platform curtains at no additional charge.

PART 2 PRODUCTS

2.1 AVAILABLE MANUFACTURERS

- A. Track:
 - 1. Automatic Devices Company.
 - 2. J. R. Clancy, Inc.
 - 3. The Janson Industries.
- B. Fabric:
 - 1. Dazian, Inc.
 - 2. K-M Fabrics, Inc.
 - 3. Melfabco, Inc.
 - 4. The Janson Industries.

2.2 MATERIALS

- A. House Curtains and Masking Drapery
 - 1. House Curtain
 - a. Material: 100 percent IFR Polyester Velour, 25-26 oz per linear yard based on a 54" width.
 - b. Color: As selected by Architect.
 - 2. House Curtain Lining
 - a. Material: IFR polyester lining, same fullness as house curtain in black or beige as selected by Architect.
 - 3. Masking Drapery: Legs, Borders and Travelers
 - a. Material: 100 percent IFR Polyester velour, 22 oz per linear yard based on 64" width.b. Color: Black.
- B. Webbing Cotton Drapes: 3-1/2" wide preshrunk IFR synthetic fabric reinforcement.
- C. Webbing Synthetic Drapes: 3" Polyester webbing.

- D. Steel Pipe: ASTM A53, Grade A, black, standard weight (Schedule 40), 1-1/2 inch nominal diameter, unless otherwise indicated.
- E. Supports, Clamps and Anchors: Sheet steel in manufacturer's standard gages; galvanized after fabrication.
- F. Support Chains: Grade 30 Proof Coil.
- G. Inserts, Bolts and Fasteners: Manufacturer's standard units.

2.3 FABRICATION - CURTAINS

- A. Curtain Fabric:
 - 1. Do not incorporate pierced horizontal or split width of materials in any part of the curtains.
 - 2. Provide all fabrics of one color from one and the same dye lot; odd-and-end usage of color is not permitted.
 - 3. Fabricate velour curtains with the nap down.
- B. Lining:
 - 1. Do not permit lining to hang loose from face material; attach to top of bottom hem of face material by tape 3/4 inch wide by 4 inches long.
 - 2. Tape sections are to be located at each vertical seam across entire width of curtain sections.
 - 3. Include integral shrinkage tuck of proper acceptable proportion.
 - 4. Do not permit lining to prevent curtains from assuming soft and even folds and be in same fullness as face material.
 - 5. Lining to be 2 inches shorter than face material.
- C. Top Finish:
 - 1. Fabrication to the specified dimensions with the specified fullness pleated to a 3-1/2 inch IFR synthetic fabric reinforcement.
 - 2. Double-stitch IFR synthetic fabric reinforcement to the top of the curtain with 1 inch of face fabric turned back under the webbing.
 - 3. Insert heavy-duty grommets at each pleat with a tie line for fastening to battens.
 - 4. Items so specified lined in same fullness as face material.
 - 5. Supply track-mounted curtains with plated wire S-hooks.
 - 6. Supply batten-mounted curtains with 36 inch braided #4 tie lines.
 - 7. Pleats:
 - a. Provide fullness in curtains by sewing additional material into 6-inch double-stitched box pleats spaced at 12 inches on center along top hem reinforcing.
 - b. Provide not less than No. 2 brass grommets, centered on box pleats, for tie lines or S hooks.
 - c. Arrange vertical seams so they do not fall on faces of pleats.
 - 8. Pleated-Fullness: Approximately 50 percent; curtain shall overlap 3 feet.
- D. Vertical Hems: Provide vertical hems not less than 2 inches wide, double-stitched and machine-sewn, with no selvage material visible from front of curtain; sew open ends of hems closed.
- E. Turn Backs: Provide turn backs formed by folding 24 inches of face fabric back at each end of panels and securing by sewing across top hem and grommeting through both layers of fabric; do not sew turn back vertically.
- F. Platform Front Curtain and Video Production Assembly:

- 1. The front curtain shall be 23 ounce cotton velour with a denim lining.
- 2. Weight curtain at bottom with 1/2 ounce galvanized steel weights in a segmented supported vinyl weight pocket sewed inside bottom hem (9 weights per foot).
- G. Teasers and Borders: Manufactured from same type material as main curtain; attach teaser to rear of Proscenium.
- H. Cyclorama: Seamless white muslin.
 - 1. Reinforce top of cyclorama with IFR synthetic fabric reinforcement with brass grommets 12" OC and double grommets at both ends.
- I. Colors: To be selected by Architect.

2.4 TRACK COMPONENTS

- A. Provide curtain tracks with the total number of carriers, head carriers, stop and all other items necessary to support the full weight of drapery material, and provide smooth operation and uniform appearance of curtains.
- B. Main Curtain:
 - 1. Provide the tracks from heavy duty channel type track constructed of 14 gauge steel formed to provide parallel double tracks for carrier wheels. Except for the bottom carrier slot, the track shall be totally enclosed.
 - a. ADC Type 283-R Silent Steel Track CWANA including 2807 Lap Clamp, 2808 Hanging Clamp, CPS-1 Center hanger, 2824 Splice Clamp, Automatic Devices Company.
 - Curtain Carriers: ADC No. 2849 Neoprene Ball Bearing Single Carrier No. 2850 Master Carrier, No. 2833-A Back-Pack Guide and No. 2826 and 2827 Rubber Spacer, Automatic Devices Company.
 - 3. Traveler Track Operating Line: Single length of first quality 1/2" diameter stretch-resistant fiberglass center braided cotton cord.
- C. Cyclorama Track Assemblies:
 - 1. Track: ADC Type 130 Flex-I-Trac CWANA including 1324 Splicing Clamp, 1323 Ceiling Clamp, 1409 End Stop. Automatic Devices Company.
 - 2. Carriers: ADC No. 1337-A Nylon Ball Bearing Carrier, 1352 Master Carrier. Automatic Devices Company.
- D. Provide track products for front and back curtains with a 1-1/2 inch pipe backbone for additional support.
- E. Battens:
 - 1. Fabricate battens from black iron pipe (1-1/2 inch, Schedule 40) with minimum number of joints.
 - 2. As necessary for required lengths, connect pipe by means of drive fit pipe sleeve not less than 18 inches long and secure with four flush rivets, plug welds or other equally secure method.
 - 3. Shop-paint completed pipe battens with good quality primer.

2.5 PIPE GRID

- A. Provide pipe grid at ceiling of Platform and video production.
- B. Pipe grid consists of a set of pipe battens installed (in plan) perpendicular to the joists.
- C. Individual pipe battens in each set to be located on 4-foot centers.

- D. Rest end of pipe battens on a shelf angle (3 inches x 2 inches) on sides of studio that have masonry wall and secure in place by means of "U" bolts at ends of all pipes.
- E. Rigidly support pipe grid by means of 1/2 inch threaded rods located on centers that shall not exceed 8 feet.
- F. Assemble entire grid into a unit structure.
- G. Pipe battens that compose the grid consists of 1.9 inch, Schedule 40, black pipe with battens spanning from wall to wall.
- H. Connect hangers to the overhead structure; hangers provided at each joist where joist crosses the line of the pipe batten.

PART 3 EXECUTION

3.1 PREPARATION

A. Furnish layouts for inserts, clips or other supports required to be installed by other trades to support tracks and battens.

3.2 INSTALLATION

- A. Install materials according to manufacturer's printed instructions and recommendations.
- B. The Contractor is fully responsible for referring Platform equipment loads in this Section to the roof steel.
- C. Supply and install auxiliary angles for pipe as required between roof steel joists or beams.
- D. Where roof steel is exposed, track may be installed directly to the steel by means of clip angles to assure a level installation.
- E. Execute work using high standard of workmanship in fabrication and erection; the finished installation must be complete and functional in every respect with drapery trimmed, leveled and left ready for use.

3.3 INSTALLATION - BATTEN

- A. Install battens by suspending at proper heights with steel chains spaced at not more than 10 feet on center.
- B. Secure chains either directly to structures or to inserts, eye-screws or other devices that are secure and appropriate to substrate and that will not deteriorate or fail with age or elevated temperatures.

3.4 INSTALLATION - TRACK

- A. Stem-mounted Tracks: Drill track at intervals not greater than manufacturer's recommended spacing, and fasten directly to structural ceiling.
- B. Batten-hung Tracks: Install track by suspending from pipe batten with manufacturer's special pipe clamps at recommended spacing.
 - 1. Heavy-duty Track: Do not exceed 6 feet between supports.
 - 2. Curved Walk-along Track: Do not exceed 4 feet between supports, and provide additional supports at curves and splices.
- C. Install track for center-parting curtains with not less than a 3 foot overlap of track sections at center, supported by special lap clamps.
3.5 INSTALLATION - CURTAINS

- A. Furnish curtain sections for full length of all tracks and pipe battens unless noted otherwise.
- B. Install draperies after the floor has been finished and the building has been cleaned.
- C. Track-hung: Secure curtains to track carriers with track manufacturer's special heavy-duty S hooks or snap hooks.
- D. Batten-hung: Secure curtains to pipe battens with minimum 5/8 inch wide by 36 inch long braided soft cotton tie lines.

3.6 ADJUSTING

- A. Adjust hardware for smooth operation.
- B. Remove temporary bracing, scaffolding, etc., to permit full operation of and access to equipment.

3.7 DEMONSTRATION

- A. Completion Testing:
 - 1. Upon completing the Work of this Section, notify the Architect to schedule an inspection.
 - 2. Furnish sufficient workers to operate equipment and to perform such adjustments and tests as may be required.
- B. Instruct Owner-designated personnel on maintenance and operation of the systems.
- C. Special Testing: If laws, ordinances, or any public authority require the Work to be specially tested or approved, give the Architect timely notice of its readiness for inspection, and of dates of inspection to be made by other authorities.

SECTION 11 66 23 - GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following gymnasium equipment:
 - 1. Basketball equipment.
 - 2. Physical Education equipment.
 - 3. Safety pads.
 - 4. Floor sleeves for pipe standards.
- B. Related Sections include the following:
 - 1. Division 26 Electrical.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, attachments to other work, and the following:
- C. Structural analysis data signed and sealed by the qualified professional engineer registered in the State of Maryland responsible for their preparation including loads, point reactions, and locations for attachment of gymnasium equipment to structure.
- D. Samples for Initial Selection: For each type of gymnasium equipment indicated.
- E. Samples for Verification: For the following products:
 - 1. Pad Fabric: Not less than 3 inches square, with specified treatments applied. Mark face of material.
- F. Qualification Data: For Installer and professional engineer.
- G. Operation and Maintenance Data: For gymnasium equipment to include in emergency, operation, and maintenance manuals.
- H. Warranty: Special warranty specified in this Section.
- I. LEED Submittal: Document no added urea formaldehyde for plywood.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, 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.
- B. Field Measurements: Verify position and elevation of floor inserts and layout for gymnasium equipment.

1.5 COORDINATION

A. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension system components with other construction including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Basketball backboard failures including glass breakage.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Performance Sports Systems.
- B. Porter Equipment Company.
- C. Draper.

2.2 MATERIALS

- A. Equipment Wall-Mounting Board: Wood, neutral-color painted finish, size, and quantity as required to mount gymnasium equipment according to manufacturer's written instructions.
- B. Anchors, Fasteners, Fittings and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; concealed; tamperproof, vandal- and theft-resistant design.

2.3 BASKETBALL EQUIPMENT

- A. Ceiling Suspended Forward Fold Backstops:
 - 1. Basis-of-Design: Model No. 3107 "Single Post" ceiling suspended, forward fold, front braced backstop as manufactured by Performance Sports Systems, Noblesville, Indiana.
 - 2. "Single Post" vertical main mast assembly shall be constructed of 6-5/8" O.D. (.120" wall ASTM A-500 Grade B) structural steel tubing with diagonal side sway braces of 2 ½"X 1 ½" X14 gauge ASTM A-513 rectangular steel tube sway braces miter cut and welded in place to a top horizontal 4" x 1 ½" x 0.18" web ASTM A-36 steel channel. Sway braces shall attach to mast above backboard for maximum rigidity. Mast and sway braces shall be welded for ceiling heights up to thirty (30) feet. Mast and sway braces shall be clamped for ceiling heights over thirty (30) feet (Model 3106). Backstop shall be front braced and fold forward. Front brace assembly shall have a fully adjustable folding knee joint allowing for exact playing position and maintenance free operation.
 - 3. Goal shall be mounted directly through backboard into a heavy structural steel weldment which shall be clamped to vertical 6-5/8" O.D. center mast. (This direct attachment feature transfers the load on the goal directly to the mast pipe minimizing stress to glass backboard). Goal and backboard mounting design shall conform to NCAA, NFSHSA and FIBA regulations.
 - 4. The all-welded "Single Post" design shall be suspended from custom adjustable hangers with bronze bushings designed to be offset no less than 4" behind the center line of gravity of mast, providing for proper weighting of the assembly and insuring that unit locks securely and automatically into playing position.
 - 5. Backstop shall be supported from 3-1/2" O.D. pipe anchored to roof framing members by means of heavy formed steel support fittings. Superstructure pipes to be reinforced with special bridging or bracing when truss centers exceed spans of fourteen (14) feet. Each attachment clamp must be capable of supporting static loads of at least 10,000 lbs. with no deflection.

- 6. All metal parts shall have factory applied powder coat finish in standard black. Available colors: white, blue, red, gray, and yellow.
- 7. Folding Method: Electric Winch.
- B. Rectangular Glass Backboards (Main Court):
 - 1. Basis-of-Design: Model No. AFRG42 Aluminum Framed Rectangular Glass Backboard by Performance Sports Systems, Noblesville, IN.
 - 2. Backboards shall be 42 inches high by 72 inches wide.
 - 3. Backboard shall be manufactured from 1/2" tempered glass set in heavy extruded aluminum framing and cushioned by shock absorbing vinyl. Official border and target area permanently fired into glass.
 - 4. Goal mounting structure shall be a heavy welded formed steel assembly, and directly attached to lower horizontal frame member to minimize stress on glass.
 - 5. Backboard shall have limited lifetime warranty against defects in material and workmanship, and when used with Performance Sports System's Direct Goal Attachment feature shall be protected against shatter and breakage of glass. Board must meet NCAA, FIBA and NFSHSA specifications.
- C. Fan Fiberglass Backboards (Side Courts):
 - 1. Basis-of-Design: Model No. 1301B Fan Shaped Fiberglass Backboard by Performance Sports Systems, Noblesville, IN.
 - 2. The 1354B backboard shall be molded from fiberglass with a tensile strength of 8,900 to 11,700 PSI and shall have 23% to 27% fiberglass content by weight. All surfaces shall be high gloss white in color with orange border and target silk screened on face of bank for permanent markings.
 - 3. Board shall have goal mounting holes shall be on 5" horizontal and 5" vertical centers and holes on 3" horizontal and 3" vertical centers to accommodate a variety of goals.
- D. Backboard Padding Kit:
 - 1. Basis-of-Design: Model No. CE or NCE Adhered Backboard Padding by Performance Sports Systems, Noblesville, IN.
 - 2. Pad consists of two pieces with molded type square corners.
 - 3. Pads molded from Polyurethane Foam (minimum 9 pound density) with integral skin (self-skinning).
 - 4. Provide a glue or peel and stick tape type attachment.
 - 5. Pad meets all competition requirements of the NBA, NCAA, NFSHSA, and international requirements of FIBA.
 - 6. Color to be selected.
- E. Basketball Goal:
 - 1. Basis-of-Design: Model No. 2000+ Breakaway Goal as manufactured by Performance Sports Systems, Noblesville, IN.
 - 2. Goal shall be fabricated from 5/8" diameter cold drawn alloy steel round formed to an 18" inside diameter ring. Inside of ring shall be positioned 6" from face of backboard by heavy, formed steel hinged-type housing with removable cover to conceal mounting bolts and shock absorption mechanism of goal and to protect against finger entrapment.
 - 3. Goal shall be designed to absorb shock loads from slam dunking or hanging on rim. Shock absorption feature shall be provided by means of a special offset hinge arrangement rim and back plate mounting housing with concealed molded rubber shock absorber.

- 4. Goal shall meet NCAA, FIBA and NFSHSA specification on moveable rims, which states, "A moveable basket ring shall have rebound characteristics identical to those of a non-moveable ring." Goal shall be factory set to proper flex and rebound requirements.
- 5. Goal shall be finished in durable, electrostatic powder coated official orange finish.
- 6. Goal shall be furnished complete with heavy-duty white anti-whip nylon netting and mounting hardware.
- F. Electric Winch:
 - 1. Basis-of-Design: Model No. 1194 Electric Backstop Winch by Performance Sports Systems, Noblesville, IN.
 - 2. Electric winch shall be a definite purpose electric winch designed specifically for use of basketball backstop positioning. Winch shall be worm gear type designed to hold backstop at any position during operation. Winch will be driven by a 3/4 HP, 120-volt, 60 hertz, single-phase instant reversing electric motor with thermal overload protection (governed to stall at 14 amps to prevent overload) and manufactured to NEMA specifications. Winch shall develop over 1000 lbs. of line pull at a speed of nine (9) feet per minute.
 - 3. Winch shall have high-speed worm gearing to support both radial and thrust loads, and positive locking double reduction gear drive providing 200:1 reduction rate for strong cable hold under load, eliminating need for special brakes. Sealed gear case for lifetime maintenance free operation.
 - 4. Winch shall incorporate a large 4-1/2" diameter grooved drum to assure long cable life and proper coiling, with a tension roller for correct cable tracking even in slack conditions. Drum shall be grooved for 1/4" 7 x 19 galvanized aircraft cable to facilitate smooth take-up and proper spooling of cable. Drum shall allow 25 feet of travel on one (1) layer and 40 feet on two (2) layers.
 - 5. Operation:
 - a. Winch shall utilize a flush mounted single keyed switch to both raise and lower backstop. Key switch shall be located so that the backstop is in full view of authorized operator at all times.
 - 6. Winch shall have five (5) year warranty against material defects and workmanship. Winches with less than a five (5) year warranty shall not be considered equal.
- G. Backstop Auto Lock Safety Strap:
 - 1. Basis-of-Design: Model No. 1100 Safstop safety strap by Performance Sports Systems, Noblesville, IN.
 - 2. Provide one for each backstop.
 - 3. Safety strap shall be inertia sensitive to automatically lock basketball backstop in position at any time (in storage or during raising or lowering cycle) due to any sudden surge of speed created by possible malfunction(s) of hoisting apparatus, winch, cable, pulleys, support fittings, etc.
 - 4. Safety strap shall incorporate a two (2) inch wide nylon belt rated at 6,000 lbs. breaking strength. Entire unit to be tested to withstand 1,500 lb. free fall load and rated at 1000 lbs. Strap shall extend a maximum of 35'-0" and shall be automatically retracted and stored on a reel equipped with a special negator type constant force spring. Operation and locking action of strap shall be set by inertial force for immediate and positive setting, or centrifugal force to instantly lock basketball backstop before unit can gain momentum. Unit shall incorporate a fully automatic reset requiring no poles, ropes, levers or buttons.

- 5. Safety strap shall be furnished with universal mounting bracket to fit 3-1/2" O.D. pipe mounted either parallel or at right angles to backboard. Belt shall be supplied with an auto-lock belt clamp for ease of securing directly to basketball backstop.
- H. Manual Basketball Backstop Height Adjuster (All Backstops):
 - 1. Basis-of-Design: Model No. 1130 Manual Adjust-A-Goal by Performance Sports Systems, Noblesville, IN.
 - 2. Height adjuster shall be manufactured of steel using an Acme threaded screw rod with awning type hand crank to raise and lower backboard. Height adjuster shall be screw driven to raise and lower goal height from 8' to 10' off of finished floor. Screw drive shall be a 3/4'' Acme double-start threaded rod secured in two bronze bushings. Height adjuster shall be operated from floor by hand crank (included with height adjuster). Height adjuster to mount directly to goal attachment to transfer load of play directly through backboard to support structure.

2.4 PHYSICAL EDUCATION EQUIPMENT

- A. Climbing Ropes:
 - Basis-of-Design: Gymnasium Design Company; Superrope.
 a. Other approved manufacturers: Porter.
 - 2. Diameter: 1 3/8".
 - 3. Metal rope head.
 - 4. Back up safety strap.
 - 5. Heat shrink boot at bottom.
 - 6. Heavy duty beam clamp.
 - 7. Knotted and unknotted ropes as shown on plans.
 - 8. Rope Hoist System for each rope.
 - 9. Provide all accessories required to attach ropes to structure above.
- B. Safety Mat Hooks: Hangar fabricated with "L" shaped steel hook with hardware for attachment included.
 - 1. Basis-of-Design: Porter No. 00143-000 Mat Hook.
- C. Peg Board: 2-inch thick hardwood peg board, size 3 ft x 5 ft.
- D. Cargo Net:
 - 1. Basis-of-Design: 10 ft. x 10 ft., manufactured by Jammar Mfg. Co, Inc. Model No. HD9-1010.
 - 2. Jammar CNHH-2 Net Hanging Hardware.
 - 3. Hoist system.
- E. Adjustable Chinning Bar:
 - 1. Basis-of-Design: Model No. 109 by Performance Sports Systems, or equal by other named manufacturers.
 - 2. Bar shall be designed to provide 24 inches of adjustment in six (6) inch increments. Unit shall consist of a bar weldment and two (2) heavy, formed channels with wall mounting plates on both ends and one at the center point.
 - 3. The bar weldment shall consist of a 1" diameter solid bar 3'-6" in length, with formed braces to support the bar 1'-5" from the wall. The ends of the formed braces shall be designed to lock into holes on the wall mounted support channels to provide the adjustment capability. The lower ends of the formed brace supports shall be fitted with spring-loaded latch mechanisms to secure unit in place and provide quick and easy height

adjustments. Bar may also be completely removed from the wall for storage when required. Hardware shall be provided to attach vertical channel assemblies to the wall.

4. Finish of entire unit to be pit and peel resistant durable, grey powder coat.

2.5 SAFETY PADS

- A. Basis-of-Design; Model No. 4120 Wall Padding with Model No. 4310 Corner Pads as manufactured by Performance Sports Systems, Noblesville, IN.
 - 1. Panels 2 feet wide x 6 feet high, corner pads are 6 inches by 6 inches by 6 feet high.
 - 2. Construct panels of 6 pound density bonded urethane foam filler cemented to 7/16 inch OSB backing board and covered with 14 ounce vinyl laminated material which shall be mildew and rot-resistant, and fortified with an infection combating fungicide and shall be stapled securely to back of plywood; cover material tear strength of 100 psi.
 - a. No added urea formaldehyde for plywood and laminating adhesive.
 - 3. Concealed Z-clip mounting system at walls and velcro mounting system at bleachers.
 - 4. Cutouts in panels shall be made in field to fit job conditions.
 - 5. Color: As selected by Architect from manufactuers full range of colors.

2.6 FLOOR SLEEVES FOR PIPE STANDARDS

- A. Floor Sleeves with Chrome Covers: Senoh Floor Plate and Sleeve KA25 (for Volleyball). Provide coverplates from Senoh to coordinate with floor plates.
- B. Cover plate consists of molded plastic recessed mounting flange, cork gasket and a 5-inch diameter chrome plated cover.
- C. Cover shall be equipped with a swivel type retainer pin to prevent theft.
- D. Special key shall be provided for cover removal.
- E. Sleeve shall be 3-3/4 inch O.D. heavy wall steel tubing extending 9 inches into concrete footing.
- F. Bottom of sleeve to be capped with a 4-inch square anchor plate.

PART 3 - EXECUTION

- 3.1 EXAMINATION
 - A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances and other conditions affecting performance.
 - 1. Verify critical dimensions.
 - 2. Examine supporting structure.
 - 3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements have been clearly marked. Locate reinforcements and mark locations.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions. Complete equipment field assembly, where required.
- B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, have been completed.

- C. Permanently Placed Gymnasium Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.
 - 1. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.
- D. Wall Safety Pads: Mount with bottom edge at 4 inches above finished floor.
- E. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed gymnasium equipment to structural support and for properly transferring load to in-place construction.

3.3 ADJUSTING

A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING

- A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment. Refer to Division 1 Section "Demonstration and Training."

SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Horizontal slat louver blinds.
- B. Operating hardware.

1.2 REFERENCE STANDARDS

A. WCMA A100.1 - Safety of Corded Window Covering Products; Window Covering Manufacturers Association; 2010. (ANSI/WCMA A101.1)

1.3 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating physical and dimensional characteristics and operating features.
- C. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.
- D. Samples: Submit two samples, minimum 18 inch long illustrating slat materials and finish, color, cord type and color.

1.4 PROJECT CONDITIONS

- A. Coordinate the work with window installation and placement of concealed blocking to support blinds.
- B. Store, handle, protect and install absorptive materials, including fabrics materials, in accordance with the Construction IAQ Management Plan required by Division 1 specifications.
- C. Take field measurements to determine sizes required.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Hunter Douglas; Product H2 Model: www.hunterdouglas.com.
- B. Levolor Contract; Product Riviera Classic DustGuard 2-inch Blind: www.levolorcontract.com.
- C. Graber, division of Springs Window Fashions; Product Bali Classic Custom Mini Blind Series 3000: www.graberblinds.com.

2.2 BLINDS AND BLIND COMPONENTS

- A. Blinds: Horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by control wand; complying with WCMA A100.1.
- B. Metal Slats: Spring tempered pre-finished aluminum; radiused slat corners, with manufacturing burrs removed.
 - 1. Width: 2 inch.
 - 2. Thickness: 0.008 inch.
 - 3. Color: As selected from manufacturers full range of available colors.
- C. Slat Support: Woven polypropylene cord, ladder configuration.

- D. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats
- E. Bottom Rail: Pre-finished, formed aluminum with top side shaped to match slat curvature; with end caps. Color: Same as headrail.
- F. Lift Cord: Braided nylon; continuous loop.
 - 1. Free end weighted.
 - 2. Color: As selected.
- G. Control Wand: Extruded solid plastic; hexagonal shape.
 - 1. Non-removable type.
 - 2. Length of window opening height less 3 inches.
 - 3. Color: clear .
- H. Headrail Attachment: Wall brackets.
- I. Accessory Hardware: Type recommended by blind manufacturer.
- 2.3 FABRICATION
 - A. Fabricate blinds to fit within openings with uniform edge clearance of 3/8 inch.
 - B. At openings requiring multiple blind units, provide separate blind assemblies with space of 1/4 inch between blinds, located at window mullion centers.

PART 3 EXECUTION

- 3.1 INSTALLATION
 - A. Install blinds in accordance with manufacturer's instructions.
 - B. Secure in place with flush countersunk fasteners.
- 3.2 INSTALLATION TOLERANCES
 - A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.
 - B. Maximum Offset From Level: 1/8 inch.

3.3 ADJUSTING

- A. Adjust blinds for smooth operation.
- 3.4 CLEANING
 - A. Clean blind surfaces just prior to occupancy.

SECTION 12 24 13 - WINDOW SHADE SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes blackout manual roller shades.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
- B. Shop Drawings: Show location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.
- C. Samples for Initial Selection: For each colored component of each type of shade indicated.1. Include similar Samples of accessories involving color selection.
- D. Samples for Verification:
 - 1. Complete, full-size operating unit not less than 16 inches wide for each type of roller shade indicated.
 - 2. For the following products:
 - a. Shade Material: Not less than 3 inches square, with specified treatments applied. Mark face of material.
 - b. Fascia: Full-size unit, not less than 12 inches long.
- E. Product Certificates: For each type of roller shade, signed by product manufacturer.
- F. Qualification Data: For Installer.
- G. Product Test Reports: For each type of roller shade.
- H. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining roller shades and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
 - 3. Operating hardware.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed installation of roller shades similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Source Limitations:
 - 1. Obtain roller shades through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Resistance Ratings: Passes NFPA 701.
- D. Product Standard: Provide roller shades complying with WCMA A 100.1.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer and product name and location of installation.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Store, handle, protect and install absorptive materials, including fabrics materials, in accordance with the Construction IAQ Management Plan required by Division 1 specifications.
- C. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.6 WARRANTY

- A. Installation: Provide roller shade installer's warranty that installation shall be free of defects for a period of not less than 1 year.
- B. In the event of a warranted product failure, the roller shade installer will, at no cost to Owner, facilitate acquisition and delivery of all necessary components to the Owner. Owner will provide roller shade dealer/installer with direct access to the work, during dealer/installer's normal business hours.

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. Rollers Shades: Before installation begins, for each size, color, texture, and pattern indicated, full-size units equal to 5 percent of amount installed, or portion thereof.

PART 2 PRODUCTS

2.1 ROLLER SHADES

- A. Basis-of-Design Products:
 - 1. Vertical Shades: Subject to compliance with requirements, provide MechoShade by MechoShade Systems or equivalent products by Draper or Rollease.
- B. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
 - 1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
 - 2. Shade band and Shade Roller Attachment:
 - a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch in diameter for manual shades, and less than 2.55 inches for motorize shades are not acceptable.

- b. Provide for positive mechanical engagement with drive / brake mechanism.
- C. Access and Material Requirements:
 - 1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
 - 2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
 - 3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.
- D. Shade Brackets: Provide shade hardware constructed of minimum 1/8-inch thick plated steel, or heavier, thicker, as required to support 150 percent of the full weight of each shade.
- E. Manual Shade Bracket: Mecho/5.
- F. Fascia: Provide at all exposed locations.
 - 1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
 - 2. Fascia shall be able to be installed across two or more shade bands in one piece.
 - 3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
 - 4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
- G. Mounting: Wall extension brackets mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
- H. Blackout Trim: Provide jamb and sill channels for blackout shades at all locations.

2.2 ROLLER SHADE FABRICATION

- A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.
- B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch in either direction per 8 feet of shade height due to warp distortion or weave design. Fabricate hem as follows:
 - 1. Concealed hem tube (Translucent Shades).
- C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

2.3 MANUAL OPERATED CHAIN DRIVE HARDWARE AND BRACKETS

- A. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
- B. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.

- C. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
- D. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable
- E. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
- F. Drive Bracket / Brake Assembly:
 - 1. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
 - 2. The entire assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
- G. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.
- 2.4 SHADE CLOTH
 - A. Blackout Shadecloth: Fabricated from pvc-free, acrylic coated, fiberglass yarn.
 1. Basis-of-Design: Mechoshade Equinox Blackout 0100 Series (opaque).
 - B. Color: Selected from manufacturer's standard colors.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions. Allow clearances for window operation hardware.
- 3.3 ADJUSTING
 - A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain roller shades.

SECTION 12 35 50 - EDUCATIONAL CASEWORK

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes plastic laminate casework and related items including, but not limited to, countertops, back splashes, filler panels, and scribe pieces, as necessary for complete installation.
 - 1. Related Sections include the following:
 - a. Division 8 Section "Resilient Flooring" for resilient wall base.
 - b. Division 22 Sections for sinks and fittings in countertops.
 - c. Division 26 Sections for electrical fittings and outlets.

1.2 SUBMITTALS

- A. Product Data: For each type of educational casework unit specified.
- B. LEED Report: Submit documentation for wood products made from sustainably harvested wood and use of recycled materials, as required by Division 01 LEED sections and appropriate forms, and Section 01 30 00.
 - 1. Provide documentation of recycled content type and percentage and costs.
- C. LEED Submittal: Provide documentation of VOC content in g/L for adhesives and sealants applied within the building waterproofing envelope. Document no added urea formaldehyde for composite wood and laminating adhesives.
- D. Shop Drawings: Include plan layout, elevations, ends, cross-sections, location and type of service fittings, required clearances, methods of assembly and reassembly, design and arrangements.
- E. Samples for Selection: Manufacturer's color charts and material samples showing full range of colors, textures, and finishes. Submit a basic container unit with shelves, dividers, base and hardware. Samples must have cutaways to clearly demonstrate materials, construction, workmanship, and finish.
- F. Sample for Verification: Submit full size sample of typical cabinet which may be incorporated into the Work if in good condition and approved by Architect. Owner may take one cabinet unit off site for deconstructive testing. Cabinet will be selected at random. Replace unit at no extra cost to Owner.
- G. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.
- H. Maintenance Data: For educational casework to include in maintenance manuals.
- I. Warranty: Special warranty specified in this Section.

1.3 QUALITY ASSURANCE

- A. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body. All non-FSC wood in assemblies with FSC-certified wood shall meet the FSC Controlled Wood (CW) criteria.
- B. Installer Qualifications: Engage a firm specializing in installation of casework for a minimum of 5 years and acceptable to manufacturer.
- C. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Unless modified by notation on Drawings, or otherwise specified, catalog description for designated product constitutes

requirements for each product and establishes a standard of design and quality for materials, construction and workmanship. Other acceptable manufacturers' laboratory casework of similar sizes, similar door and drawer configurations, and complying with the Specifications will be accepted

- D. Single Source Responsibility: To assure coordinated unit design, all items in each room or space, other than appliances and special equipment specified in other Sections, shall be products of one manufacturer to the greatest extent possible.
- E. Quality Standard: Except as otherwise indicated, comply with the following standards:
 - 1. AWI Cabinet Quality Standard: AWI Section 1600.
 - 2. AWI Countertop Quality Standard: AWI Section 400C.
- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Administrative Requirements."

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating educational casework without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of educational casework that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: 3 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Case Systems, Inc.
 - 2. Cabinets by Design, Inc.
 - 3. The Mastercraft Woodworking Company.
 - 4. Stevens Cabinet Company, Inc.
 - 5. TMI Systems Design Corporation.

2.2 MATERIALS

- A. High Pressure Decorative Laminate: NEMA LD3, grades as indicated.
 - 1. Plastic Laminate: Vertical General Purpose Grade (VGS), 0.030-inch nominal thickness; for exterior cabinet surfaces, interiors of open cabinets, and underside of wall cabinets.
 - 2. Plastic Laminate Balancing Sheet: Cabinet Liner Grade (CLS), 0.020-inch nominal thickness, white high-pressure cabinet liner, for balancing exterior laminate surfaces.
 - 3. Laminating adhesives: No added urea formaldehyde resins.
- B. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Formica Corporation.
 - b. Nevamar; International Paper; Decorative Products Div.
 - c. Wilsonart International; Div. of Premark International, Inc.
- 2. Colors: As selected by Architect from manufacturer's full range of finishes and colors consisting of both patterns, metals, and solid colors. Provide a minimum of 100 patterns/colors to select from.
- 3. End panels may match face or may be a color as selected from manufacturer's standard finishes and colors.
- 4. A maximum total of 8 different casework colors will be selected for this Project. All exposed exterior elements including edges, door and cabinet sides, and exposed backs shall be available in matching color.
- C. Pressure Fused Laminate: Melamine resin impregnated, 90 gram PSM minimum, thermofused to core under pressure, complying with NEMA LD3 VGS and NEMA LD3 CLS standards.
 - 1. Provide white pressure fused laminate for cabinet interiors behind doors and drawers.
 - 2. Provide balanced construction at all concealed surfaces with thermofused melamine. Unsurfaced coreboard or simple backers will not be accepted.
- D. Plywood complying with DOC PS 1. No added urea formaldehyde resins.
- E. Hardboard:
 - 1. Hardboard shall meet or exceed Commercial Standards CS-251 and Federal Specifications LLL-B-00810.
 - 2. Tempered Hardboard 1/4 inch thick, smooth both sides.
 - 3. Hardboard exposed one side to be 1/4 inch thick, prefinished in putty color to match cabinet interior. Opposite face prefinished with neutral color balance coating.
- F. Edging Materials: Comply with the following:
 - 1. Exposed Exterior Cabinet Edges, Interior Dividers, Drawer Bodies, and Shelves: Banded with matching material, resistant to chipping, cracking, and high impact, applied with waterproof hot melt adhesive.
 - 2. Door and Drawer Front Edges: Banded with contrasting or matching PVC extrusion, 3 mm thick, resistant to chipping, cracking, and high impact, applied with waterproof hot melt adhesive, and shaped to provide radiused edges and corners.
 - 3. Color selection for PVC edging will be made at a later date; Architect reserves the right to select colors manufactured and offered by Woodtape Edge Banding (at no additional cost to the Owner), when a standard selection offered by the casework manufacturer does not provide a suitable color in the Architect's opinion.
- G. Hardware:
 - 1. Hinges: Hinges fully concealed from view when door is in closed position and shall permit 176-degree door swing. Hinge crank of heavy duty steel with a concealed integral self-closing spring mechanism. Hinge bosses of heavy duty diecast steel. Nylon expansion inserts to be provided in door for positive screw attachment. Hinge shall incorporate mounting features providing three-dimensional adjustment. Hinges to have lifetime guarantee as warranted by manufacturer. Doors less than 48 inches in height with 2 hinges per door, doors 48 to 63 inches in height with 3 hinges per door and all doors in excess of 63 inches with 4 hinges per door.
 - 2. Wire Pulls: Stainless steel, accurately positioned on door and drawer front with #8-32 screws.

- 3. Door Catch: Heavy duty, spring-loaded, large roller type. Each door with a single catch mounted at the bottom edge. All mobile cabinets and doors over 48 inches high with a catch at both top and bottom of door.
- 4. Catch Strike Plate: Injection molded nylon, almond color, with integral molded engagement ridge. Strike plate to also provide a wide face bumper insuring a positive door stop.
- 5. Hanger Rods: 1-inch diameter heavy gage plated tubing, securely affixed in cabinet with injection molded rod sockets.
- 6. Drawer and Slide-Out Shelf Slides: Nylon roller steel slides to insure quiet, smooth operation. 100-lb load rating with built-in drawer stop and self-close feature in the last 1-inch of travel.
- 7. File Drawer Slides: Full extension steel slides with ball bearing nylon rollers. 100-lb. load rating.
- 8. Locks: Cylinder type, diecast, with 5 disc tumbler mechanism. Each lock to be provided with a milled brass key with keying options of keyed alike, keyed different, and master keyed locks, as selected by Owner. Provide locks on all cabinet doors and drawers, except sink and fumehood base cabinets.
- 9. Grommets: Plastic or metal, 1.5-inch-diameter, placed at each computer station.
- H. Adjustable Shelf Support System:
 - Support Clips for Adjustable Shelves: 3/4-inch-and 1-inch-thick, injection molded nylon, incorporating integrally molded lock tabs to retain shelf from tipping or inadvertently being lifted out. Support clip to have double pin engagement into precision bored hole pattern in cabinet vertical members, with molded ridge in the clip body to provide additional pressure against edge of shelving and to maintain positive pin engagement. Clip shall be designed to provide means to permanently attach shelf to support clips. Static test load must exceed 200-lb per clip.
 - 2. Vertical and Horizontal Shelf Dividers: 1/4-inch-thick, fully adjustable and retained with injection molded nylon support clip designed to trap divider to eliminate inadvertent lift out.
 - 3. Adjustable Shelves and Dividers: Adjustable at 1.25 inches o.c. through full height of compartment.
- I. Wardrobe Clothes Pole: 1-1/16-inch chrome steel rod LH-362.
- J. Wardrobe Clothes Pole Socket: Knape & Vogt #734 Flange Chrome.
- K. Coat Hooks:
 - 1. Single coat hooks HEWI No. 520.60.1 ABS plastic, color to be selected by Architect from manufacturer's full range.
 - 2. Double coat hooks HEWI 520.50.2 ABS plastic, color to be selected by Architect from manufacturer's full range.
 - 3. Ceiling hooks HEWI 513 ABS plastic, color to be selected by Architect from manufacturer's full range.
- L. Hangers: Captive and removable wood or metal; 17-inch.
- 2.3 COUNTERTOPS
 - A. Reference Section 12 36 00 Countertops.
- 2.4 FABRICATION, GENERAL
 - A. Cabinet Construction: High-pressure plastic laminate surface finish; flush overlay type door/drawer style.

- B. Chemical Content: All materials used shall be relatively nontoxic when exposed to heat or flame.
- C. Wall Hung Units: When mounted on a wall and loaded with 25 psf on all horizontal surfaces, units shall resist a lateral force applied at the bottom of the cabinet parallel to the long dimension of the cabinet of 300 lbs without failure. Each wall hung unit shall safely support a uniform load of 600 lbs.
- D. Storage units with or without doors shall be able to have shelves and/or vertical dividers rearranged within one or more units of same size without defacing interior of unit.

2.5 FABRICATION, CABINETS

A. Drawers:

- 1. Drawers: Full box body design with a separate front; body sides and ends minimum 5/8-inch medium density fiberboard with almond color melamine laminate faces and matching almond color PVC top edges; bottoms minimum 1/4-inch thick medium density fiberboard with almond color facing.
- 2. Corner Joints: Interlocking dowel pin design, with 8mm diameter dowel pins inserted into drawer ends and fitted into matching hole patterns in drawer sides. Bottoms to be let into grooves all four sides; all joints glued and bottoms shall have additional mechanical fasteners; drawers to operate on mechanical slides as separately described.
- 3. Separate drawer front, surfaced and edges as described, attached to drawer body with no less than 4 screws through front side.
- B. Solid Hinged Doors: 3/4-inch thick plywood core, balanced construction laminate faces. Surfacing, edging and hinges as separately described.
- C. Solid Sliding Doors: 3/4-inch thick plywood core, balanced construction laminate faces. Each door with 2 nylon rollers mounted in bottom of door panel, and with door operating in aluminum top and bottom tracks. Surfacing and edging as separately described.
- D. Sliding Display Doors: Constructed of 1/4-inch thick, distortion free glazing sheets. Outer edge to have full length aluminum pull channel for strength. Doors must be accurately sized for easy movement in upper and lower extruded aluminum guide channels.
- E. Adjustable Shelves: Shelves less than 36 inches in length shall be 3/4 inches thick. Shelves 36 inches long and over, and all adjustable shelves in wall cabinets and bookcases shall be 1 inch thick. Shelves shall be constructed of plywood with almond color melamine laminate surfaces. Leading edge of shelf finished with a high impact, rigid PVC extrusion, almond in color to match shelf surface and cabinet interior. Exposed surfaces of open shelving without doors shall be finished with plastic laminate.
- F. Frame Rails Between Drawers: Full cabinet length, 3/4 inches thick by 3-1/2 inches wide, pinned, and fastened into cabinet sides. Front leading edge to be edged as separately described.
- G. Tote Trays: High impact polystyrene with smooth edges. Provide each tray with a card holder. Suspend tote trays from rails securely attached to cabinet partitions and sides.
- 2.6 FABRICATION, FIXED CASEWORK (BASE, WALL, HUTCH, AND TALL UNITS)
 - A. Corner Joints: Incorporate fluted hardwood dowel pin construction, factory glued and clamped under pressure to assure rigid loadbearing corner joints.
 - B. Cabinet Ends: 3/4-inch-thick panels of balanced construction, precision bored for fluted hardwood dowel pins installed in horizontal cabinet members. Base and tall units with one

piece end panels continuous to floor for added load capability. Unexposed ends with laminate backing sheet.

- C. Cabinet Bottoms and Tops: 3/4-inch-thick panels of balanced construction for base and tall units. Precision bore panels to receive fluted hardwood dowel pins inserted with glue. Dowel pins shall extend from the panel ends for joining into mating hole patterns in the cabinets' side panels.
- D. Wall Cabinets: Full 1-inch-thick panels of balanced construction, with the same fluted hardwood fluted dowel pin and glue joint construction as the base and tall cabinets.
- E. Kick Panels: 4-inch-high, set back from cabinets' front edge and mechanically fastened to cabinet bottom and ends, to be an integral part of cabinet structure.
- F. Back Panels: 3/8-inch-thick, set in 3/8 inch from rear panels of balanced construction surfaced as described.
- G. Finished exposed backs of fixed cabinets shall be 3/4-inch-thick panels of balanced construction surfaced as described.
- H. Hanging rails to be provided in wall cabinets in upper back corner for mounting units to walls.
- I. Cabinet Subbase:
 - 1. To be separate and continuous (no cabinet body sides-to-floor), water-resistant exterior grade plywood with concealed fastening to cabinet bottom.
 - 2. Ladder-type construction of front, back and intermediates to form a secure and level platform to which cabinets attach.

2.7 FABRICATION, MOBILE CASEWORK

- A. Corner Joints: Incorporate a rigid fluted hardwood dowel pin construction system, glued and clamped under pressure.
- B. Ends: 3/4-inch-thick panels of balanced construction precision bored for dowel pins installed in horizontal cabinet members.
- C. Mobile Cabinets: Provide with a double bottom and top frame panel design.
 - 1. Interior bottoms and tops, 3/4-inch-thick panels of balanced construction. The front leading edge of these panels built-up to 1-1/2 inch thick and edged with rigid PVC. Panels bored to receive fluted dowel pins with pins to be inserted with glue and join mating hole pattern in cabinet side panel.
 - 2. Exterior bottoms and tops, 3/4-inch thick panels of balanced construction. Panels to extend past all four sides of the unit and edged with high impact plastic extrusion to form a wrap-around bumper system to prevent damage during normal use. Bumper system shall be standard on all mobile units.
- D. Casters: Provide each mobile cabinet with four heavy duty 5-inch ball bearing swivel casters with a minimum wheel face of 1-1/4 inches, and 290-lb working load rating per caster. Provide two front casters with wheel lock. Attach each caster with four flat head bolts with lock nuts through bottom panels.
- E. Backs: 3/4-inch-thick panel of balanced construction and finished with exterior surfaces laminate. Backs tenoned into cabinet ends and grooved to accept interior top and bottom panels, and fastened with glue, screws, and corner brackets.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for, installation tolerances, and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION, GENERAL
 - A. Do not install casework units until painting and drywall work in the space has been completed and the space is dry.
 - B. Install cabinets in such a way that relocation can be accomplished without marred end panels and use of special tools.
 - C. Install cabinets under supervision of manufacturer's representative with factory-trained journeymen authorized by manufacturer.
 - D. Install cabinets indicated on Drawings in correct locations.
 - E. Erect casework straight, level and plumb and securely anchor in place; base cabinets installed on plywood ladder bases.
 - F. Mount wall-hung cabinets on concealed 1-by-3 softwood hanging strips secured to wall with expansion or toggle bolts, minimum four per cabinet.
 - G. Firmly anchor fixed cabinets and any required scribe moldings to walls and floors. Finish of scribe molding shall match cabinets.
 - H. Furnish scribes 3/4 inch thick and filler pieces to fill spaces in material matching cabinet panels or frames, between units and between units and walls where open spaces occur.
 - I. Patch surfaces damaged by installation to new condition or remove and install new material as approved.
 - J. Rims of sinks specified in Division 15 shall be set in sealant to insure waterproof seal between rim and countertop.

3.3 CLEANING AND PROTECTION

- A. Leave finished work clean, free of scratches, dents, gouges, or other damage, with doors and drawers operating freely at time of final acceptance. Leave work area clean and free of debris.
- B. Protect materials and installed casework from damage by work of other trades.

SECTION 12 35 51 - MUSICAL INSTRUMENT STORAGE CABINETS

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Musical instrument and uniform cabinet system.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Design system of storage cabinets for uniforms (ventilated) and musical instruments which are chip- and abrasion-resistant under normal usage and will protect instruments and cases from damage under normal use.
 - 2. Design shelving to withstand continuous use without surface or front edge breakdown.
 - 3. Design cabinet panels with polyester laminate on both sides to provide modularity and/or relocation of any cabinet.

1.3 PERFORMANCE REQUIREMENTS

- A. Hanger rods shall support a minimum vertical load of 200 lbs applied anywhere.
- B. Full height doors shall support a minimum vertical live load of 315 lbs applied to outer edge.
- C. Compartment door hinges must be through-bolt construction to cabinet panels; other attachment will not be accepted.

1.4 SUBMITTALS

- A. Product Data: Applicable reference standards, performance data, and application recommendations and limitations, and finishes.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of material exposed to view.
- D. Samples for Verification: For the following materials, in sets showing full range of color, texture, and pattern variations expected:
 - 1. Plastic Laminate for Casework Finish: 8 by 10 inches.
 - 2. Hardware: One unit of each type of exposed hardware.
- E. Product Schedule: For musical instrument storage cabinets. Use same designations indicated on Drawings.
- F. Product Certificates: For each type of musical instrument storage cabinet, signed by product manufacturer certifying that products furnished comply with requirements.
- G. Maintenance Data: To include in maintenance manuals.
- H. Warranty: Special warranty specified in this Section.
- I. Submit certification of application of borate treatment to woodwork in contact with slab.
- J. LEED Submittals:
 - 1. Credit EQ 4.1: Manufacturers' product data for installation adhesives, including printed statement of VOC content.
 - 2. Credit EQ 4.4:

- a. Composite wood manufacturer's product data for each composite wood product used indicating that the bonding agent contains no urea formaldehyde.
- b. Adhesive manufacturer's product data for each adhesive used indicating that the adhesive contains no urea formaldehyde.
- 3. Credit MR 7: Certificates of chain-of-custody signed by manufacturers certifying that products specified to be made from certified wood were made from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria." Include evidence that mill is certified for chain-of-custody by an FSC-accredited certification body.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative of musical instrument storage cabinet manufacturer for installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain cabinets through one source from a single manufacturer.
- C. Product Options: Drawings indicate size, profiles, dimensional requirements, and finish material of casework by referencing designated manufacturer's catalog numbers. Other manufacturers' casework of similar sizes, similar door and drawer configurations, same finish material, and complying with the Specifications may be considered. Refer to Division 1 Section "Product Requirements."
- D. Quality Standards: Unless otherwise indicated, comply with the following standards:
 - 1. ANSI/BHMA Standard A156.9, Grade 1.
 - 2. American Laminators Association Performance Standard ALA 1985.
- E. Forest Certification: Provide interior architectural woodwork produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver musical instrument storage cabinets only after painting and similar operations that could damage, soil, or deteriorate cabinets have been completed in installation areas where cabinets must be stored in other than installation areas; store only in areas where environmental conditions meet requirements specified in "Project Conditions" Article.
- B. Keep finished surfaces covered with polyethylene film or other protective covering during handling and installation.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install musical instrument storage cabinets 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 musical instrument storage cabinets are indicated to fit to other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating musical instrument storage cabinets without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

A. Coordinate layout and installation of blocking and reinforcement in partitions for support of cabinets.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of musical instrument storage cabinets that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Delamination of components or other failures of glue bond.
 - 2. Warping of components.
 - 3. Failure of operating hardware.
 - 4. Deterioration of finishes.
- B. Warranty Period: Three 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. Wenger Corporation (Basis-of-Design).
 - 2. Case Systems.
 - 3. Stevens Cabinet Company.

2.2 MATERIALS

- A. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Particleboard: ANSI A208.1, Type M-3 Exterior Glue complying with requirements in ANSI A208.1, Grade M-3.
 - a. Recycled Content: Minimum 80 percent.
 - 3. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no added urea formaldehyde.
- B. Thermoset Decorative Panels: Particleboard 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.
- C. High-Pressure Decorative Laminate: NEMA LD 3.
- D. Adhesives, General: Do not use adhesives that contain urea formaldehyde.
 - 1. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Wood Glues: 30 g/L.
 - b. Contact Adhesive: 250 g/L.
- 2.3 MATERIALS, GENERAL
 - A. Cabinet Wall Panels: 3/4-inch-thick industrial (cabinet) grade particleboard, minimum 48 pcf with thermoset polyester laminate on both sides for totally finished construction.

- B. Cabinet Shelving:
 - 1. Cabinets up to 27 Inches Wide: One-piece, high molecular, blow-molded polyethylene with radiused front edge. Mount to cabinet walls with one-piece molded rigid ST nylon clip. Shelf is replaceable.
 - 2. Cabinets over 27 Inches Wide: One-piece, high molecular-formed polyethylene with radiused front edge and 3/16-inch wall thickness. Ribbed for structural integrity. Supported by four 1-by 1-1/2 inch steel tubes with 0.060-inch-thick wall thickness and 0.075-inch-thick plates welded to ends.
- C. Wood Doors: Same construction as cabinet walls.
 - 1. Finish: Maple.
 - a. Available Product: Timber Products; Plank Maple Birch.
 - 2. Hardware:
 - a. Hinges: 5-knuckle, institutional type hinge, capable of supporting 315 lbs. dynamic vertical load. Hinge pin shall be 2-3/4 inches long. Fastened to cabinet and door with through-bolt construction. Provide two hinges on compartment doors; four hinges on full height doors.
 - 1) Finish: Powder coating.
 - b. Lock: Locking slide-bolt designed for padlocks, with strike plate; 0.105-inch-thick steel. Provide clear plastic label holder for identification card insert.
 - 1) Finish: Powder coating.
- D. Grille Doors: Welded steel grille construction with powder coat finish. Welds at tee-joints shall be 360 degrees.
 - 1. Hardware:
 - a. Hinges: 5-knuckle, institutional type hinge, capable of supporting 315 lbs. dynamic vertical load. Hinge pin shall be 2-3/4 inches long. Weld to door frame in five places. Fasten to cabinet and door with through-bolt construction. Provide two hinges on compartment doors; four hinges on full height doors.
 - b. Finish: Powder coating.
- E. Edging: Heat bonded 3 mm beveled PVC edge-banding.
- F. Finish Hardware:
 - 1. Joinery Hardware: 2-inch, 1/4-20 panel connectors with 15 mm head diameter, and steel thread inserts.
 - 2. Cabinet Levelers: Four leveling glides within minimum 3/8-inch diameter threaded rod in steel corner brackets, six glides for cabinets with divider panels.
- G. Cabinet Back Panel:
 - 1. Cabinet Back: 1/4-inch-thick prefinished hardboard. Match color of interior side of top panels.

2.4 ACCESSORIES

- A. Vertical Closure Kit: Provide visual closure between wall and cabinet. Constructed of 3/4-inch-thick thermoset polyester composite wood to match cabinet side panels for 3/4 inch to 30 inch wide openings.
- B. Horizontal Closure Kit: Provide visual closure between top of cabinet and soffit. Constructed of 3/4-inch-thick thermoset polyester composite wood to match cabinet side panels for 3/4 inch to 30 inch high openings.

- C. Top Back Filler Kit: Provide visual closure between back wall and top panel of cabinet. Constructed of 3/4-inch-thick thermoset polyester composite wood to match cabinet top panels for 10-inch and 20-inch deep openings.
- D. Finished Back Panel: Provide panel to attach to cabinet back that is exposed. Constructed of 1/2-inch-thick thermoset polyester composite wood to match cabinet.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for, installation tolerances, location of reinforcements, and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CABINET ERECTION

- A. Install cabinet system in accordance with manufacturer's instructions.
- B. Install cabinet system with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.
- C. Install cabinet system without distortion so doors and drawers fit openings and are aligned. Complete installation of hardware and accessories as indicated.
- D. Install cabinet system level and plumb to a tolerance of 1/8 inch in 8 feet.
- E. Fasten cabinets to adjacent units and to backing.
 - 1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.
 - 2. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c., with toggle bolts through metal backing behind gypsum board.

3.3 TERMITE TREATMENT

A. Field-apply borate surface treatment to lower 12 inches of woodwork in contact with slab on grade.

3.4 ADJUSTING AND CLEANING

- A. Adjust cabinets and hardware so doors are centered in openings and operate smoothly without warp or bind Lubricate operating hardware as recommended by manufacturer.
- B. Clean cabinets on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas to match original factory-finish as approved by Architect.

3.5 PROTECTION

A. Provide 6-mil plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

SECTION 12 36 00 - COUNTERTOPS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Countertops for architectural cabinetwork.
- B. Wall-hung counters and vanity tops.
- 1.2 RELATED REQUIREMENTS
 - A. Section 06 41 00 Architectural Wood Casework.

1.3 REFERENCE STANDARDS

- A. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.
- B. AWI/AWMAC (QSI) Quality Standard Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.
- C. NEMA LD 3 High-Pressure Decorative Laminates; 2005.
- D. PS 1 Structural Plywood; 2007.

1.4 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- F. LEED Report: Submit for wood products made from sustainably harvested wood, salvaged and reused wood, wood fabricated from recovered timber, and locally-sourced wood, as specified in Section 01 35 15.
- G. LEED Submittals: Provide documentation of VOC content in g/L for adhesives applied within the building waterproofing envelope; document no added urea formaldehyde for composite wood, agrifiber products and laminating adhesives.
- H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
- B. Installer Qualifications: Fabricator.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 COUNTERTOP ASSEMBLIES

- A. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
 - 1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3 Grade HGS, 0.048 inch nominal thickness.
 - a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E84.
 - b. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
 - 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 laminate manufacturer's full range in solid colors, wood grains, metals, and patterns, including stone, marble and leathers.
 - 2) Ten different colors may be selected by Architect for this Project.
 - d. Manufacturers:
 - 1) Formica Corporation : www.formica.com.
 - 2) Lamin-Art, Inc : www.laminart.com.
 - 3) Panolam Industries International, Inc\Nevamar : www.nevamar.com.
 - 4) Panolam Industries International, Inc\Pionite : www.pionitelaminates.com.
 - 5) Wilsonart International, Inc : www.wilsonart.com.
 - 2. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch thick; covered with 3mm polyvinylchloride (PVC), machine applied with hot melt adhesive, inside/outside length radiused, corner radiused and buffed.
 - a. Color selection for PVC edging will be made at a later date; Architect reserves the right to select colors manufactured and offered by Woodtape Edge Banding (at no additional cost to the Owner), when a standard selection offered by the casework manufacturer does not provide a suitable color in the Architect's opinion.
 - 3. Back and End Splashes: Same material, same construction.
 - 4. Fabricate in accordance with AWI/AWMAC Quality Standards Illustrated Premium Grade.

2.2 ACCESSORY MATERIALS

- A. Wood-Based Components:
 - 1. Wood fabricated from old growth timber is not permitted.
 - 2. Composite Wood and Agrifiber Products: No added urea formaldehyde.
- B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
- C. Backer Sheet: Provide substrate with laminate backer sheet.

D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined. No added urea formaldehyde.

2.3 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.
- 3.2 INSTALLATION
 - A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
 - B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
 - C. Seal joint between back/end splashes and vertical surfaces.

3.3 CLEANING AND PROTECTION

- A. Clean countertops surfaces thoroughly.
- B. Protect installed products until completion of project.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 12 93 00 - SITE FURNISHINGS

PART 1 - GENERAL:

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following site furnishings for the Rooftop Educational Area:
 - 1. Benches.
 - 2. Planters.
 - 3. Storage Chest.
 - 4. Bike Racks.
- B. Related Sections include the following:
 - 1. Division 31 Section "Earthwork" for excavation for installation of concrete footings.
 - 2. Division 3 Section "Cast-in-Place Concrete" for formed voids in concrete footings.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details.
 - 1. Submit location of product manufacture
- B. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Size: Not less than 6-inch- long linear components and 4-inch- square sheet components.
- C. Product Schedule: For site furnishings. Use same designations indicated on Drawings.
- D. Material Certificates: For site furnishings, signed by manufacturers.
 - 1. Recycled plastic.
- E. Maintenance Data: For site furnishings to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of site and street furnishings through one source from a single manufacturer.

1.5 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. Bench Replacement Slats: Not less than two full-size units for each size indicated.
 - 2. Trash Receptacle Inner Containers: 1 full-size unit.

PART 2 - PRODUCTS:

2.1 BENCHES

- A. Basis-of-Design: Sitecraft, Model Woodcrest BKF; www.site-craft.com/BKF.
- B. In lengths as indicated on drawings
- C. Surface mounted to concrete roof deck

D. In Greenwood (high density wood substitute) cedar color

2.2 PLANTERS

- A. Basis-of-Design: Sitecraft, Model S; www.site-craft.com/S.
- B. Custom shape as indicated on drawings
- C. In Greenwood (high density wood substitute) cedar color
- 2.3 STORAGE CHEST
 - A. Basis-of-Design: Country Casual Teak, Model Harborside Storage Chest; www.countrycasualteak.com.
 - B. Size: 57 inches by 24 1/2 inches by 19 1/2 inches.
 - C. Natural Teak with sealer.

2.4 BIKE RACKS:

- A. Basis-of-Design: Dero Bike Rack, Model 5H; www.dero.com.
- B. Materials:
 - 1. 2.375" OD Schedule 40 Pipe per ASTM A53
 - 2. In ground Rolling Racks have a 3/8" x 3" steel rod welded to the bottom to ensure the rack doesn't pull out after the concrete cures.
 - 3. Surface mount Rolling Racks have two 5.5" x 5.25" x .25" feet.
- C. Finish:
 - 1. TGIC powder-coated finish.
 - a. Color as selected by Architect from manufacturers full range.

2.5 FABRICATION

- A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.
- D. Steel and Iron Components: Galvanized, galvanized and color coated, or color coated. Bare metal steel or iron components are not permitted.
- E. Exposed Surfaces: Polished, sanded, or otherwise finished; smooth all surfaces, free from burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
- F. Factory Assembly: Assemble components in the factory to the greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 STEEL AND GALVANIZED STEEL FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester-TGIC, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION:

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION, GENERAL
 - A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of site and street furnishings, where required.
 - B. Unless otherwise indicated, install site and street furnishings after landscaping and paving have been completed.
 - C. Install site and street furnishings level, plumb, true, and securely anchored or positioned at locations indicated on Drawings.

3.3 CLEANING

A. After completing site and street furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

SECTION 14 24 00 - HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies hydraulic elevators.
- B. Work Required:
 - 1. The work required under this section consists of all labor, materials and services required for the complete installation (including operational verification) of all the equipment required for the elevator(s) as herein specified.
 - 2. All work shall be performed in a first class, safe and workmanlike manner.
 - 3. In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts as are required to make complete installation.
- C. Related work not specified herein: The following sections contain requirements that relate to this section and are performed by trades other than the elevator manufacturer/installer.
 - 1. Division 3 Cast-In-Place Concrete: elevator pit, elevator motor and pump foundation, and grouting thresholds.
 - 2. Division 4 Unit Masonry: masonry hoistway enclosure, building-in and grouting hoistway door frames, grouting thresholds.
 - 3. Division 5 Metal Fabrications: pit ladder, divider beams, support for entrances and rails, hoisting beam at top of hoistway.
 - 4. Division 26 Electrical:
 - a. Main disconnects for each elevator.
 - b. Electrical power for elevator installation and testing.
 - c. Disconnecting device to elevator equipment prior to activation of sprinkler system.
 - d. The installation of dedicated GFCI receptacles in the pit and overhead.
 - e. Lighting in controller area, machine area and pit.
 - f. Wiring for telephone service to controller.
 - 5. Division 26 Generators: emergency generator for elevator operation.
 - 6. Division 28 Fire Alarm Systems: fire and smoke detectors and interconnecting devices; fire alarm signal lines to contacts in the machine area.
 - 7. Division 27 Telephone Systems: ADAAG-required emergency communications equipment.
- D. Applicable Codes: Comply with applicable building and elevator codes at the project site, including but not limited to the following:
 - 1. ANSI A117.1, Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People.
 - 2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.
 - 3. ANSI/NFPA 70, National Electrical Code.
 - 4. ANSI/NFPA 80, Fire Doors and Windows.
 - 5. ASME/ANSI A17.7, Safety Code for Elevators and Escalators.
 - 6. ANSI/UL 10B, Fire Tests of Door Assemblies.
 - 7. CAN/CSA C22.1, Canadian Electrical Code.
 - 8. CAN/CSA-B44, Safety Code for Elevators and Escalators.
 - 9. EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 immunity"

- 10. Phone line monitoring in conformance with ASME 2009 elevator codes, including audible alarm.
- 11. Local Building Codes.
- 12. All other local applicable codes.

1.2 SYSTEM DESCRIPTION

- A. Equipment Description: Holeless Hydraulic elevator with remote machine room.
- B. Equipment Control: Elevonic® Control System.
- C. Quantity of Elevators: 1
- D. Number of Stops: 2
- E. Openings: 2 front & 0 rear openings.
- F. Travel: Refer to Drawings.
- G. Rated Capacity: 2500 lb.
- H. Rated Speed: 100 fpm.
- I. Platform Size: 6'-6 ³/₄" W x 4'-11 1/8" D
- J. Clear Inside Dimensions: 6'-5 9/16" W x 4'-3 9/16" D
- K. Cab Height: 7'-9"
- L. Clear Cab Height: 7'-4 3/8" with 5/16" floor recess and dropped 6 LED ceiling.
- M. Entrance Type and Width: Single-Slide Door 3' 6"
- N. Entrance Height: 7' 0"
- O. Main Power Supply: Refer to electrical drawings, 3-Phase, 60Hz + or 5% of normal, three-Phase, with a separate equipment grounding conductor.
- P. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.
- Q. Machine and Controller Location: Remote machine room.
- R. Signal Fixtures: Manufacturer's standard with stainless steel metal button targets.
- S. Stopping Accuracy: $\pm 1/4$ " (6.4 mm) under any loading condition or direction of travel.
- T. Protection Pads: Include 1 set of protections pads and hooks.
- U. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
- V. Operating Features
 - 1. Full Collective Operation
 - 2. Anti-nuisance.
 - 3. Fan and Light Protection.
 - 4. Load Weighing Bypass.
 - 5. Independent Service.
 - 6. Firefighters' Service Phase I and Phase II.
 - 7. Top of Car Inspection.
 - 8. Remote elevator monitoring REM ready.
- W. Door Control Features:
 - 1. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

- 2. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.
- 3. Door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.
- 4. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.
- X. Provide equipment according to seismic zone: 1.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:
 - 1. Signal and operating fixtures, operating panels and indicators.
 - 2. Cab design, dimensions and layout.
 - 3. Hoistway-door and frame details.
 - 4. Electrical characteristics and connection requirements.
 - 5. Expected heat dissipation of elevator equipment in hoistway (BTU).
 - 6. Color selection chart for Cab and Entrances.
- B. Shop Drawings: Submit approval layout drawings. Include the following:
 - 1. Car, guide rails, buffers and other components in hoistway.
 - 2. Maximum rail bracket spacing.
 - 3. Maximum loads imposed on guide rails requiring load transfer to building structure.
 - 4. Clearances and travel of car.
 - 5. Clear inside hoistway and pit dimensions.
 - 6. Location and sizes of access doors, hoistway entrances and frames.
- C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.
- D. LEED Submittals:
 - 1. Product data for Credit IEQ 4.1: For adhesives and sealants applied within the building waterproofing envelope, documentation including printed statement of VOC content in g/L.
 - 2. Product data for Credit IEQ 4.2: For paints and coatings applied within the building water proofing envelope, documentation including printed statement of VOC content in g/L.
 - 3. Product data for Credit IEQ 4.3: For resilient flooring, base, and associated accessories, documentation including printed statement of compliance with the Resilient Floor Covering Institute's (RFCI) FloorScore Program.
 - 4. Product data for Credit IEQ 4.4: For composite wood and laminating adhesives, documentation indicating no added urea formaldehyde resins.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Elevator manufacturer shall be ISO 9001 certified.
- B. Installer: Elevators shall be installed by the manufacturer.
- C. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations or such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.
1.5 DELIVERY, STORAGE AND HANDLING

A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.

1.6 WARRANTY

A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The warranty period shall not extend longer than one (2) years from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The warranty excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

1.7 MAINTENANCE and SERVICE

- A. Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of [Select the appropriate new installation maintenance period: twelve (12) months after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.
- B. The elevator control system must:
 - 1. Provide in the controller the necessary devices to run the elevator on inspection operation.
 - 2. Provide on top of the car the necessary devices to run the elevator in inspection operation.
 - 3. Provide in the controller an emergency stop switch. This emergency stop switch when opened disconnects power from the brake and prevents the motor from running.
 - 4. Provide the means from the controller to reset elevator earthquake operation.
- C. Provide system capabilities to enable a remote expert to create a live, interactive connection with the elevator system to enable the following functions:
 - 1. Remotely diagnose elevator issues with a remote team of experts
 - 2. Remotely return an elevator to service
 - 3. Provide real-time status updates via email
 - 4. Remotely make changes to selected elevator functions including:
 - a. Control building traffic: Restrict floor access, remove car from group operation, shut down elevator, select up peak / down peak mode, activate independent service
 - b. Conserve energy: Activate cab light energy save mode, activate fan energy save mode, shut down car(s)
 - c. Improve passenger experience: Extend door open times, change parking floor, activate auto car full, activate anti-nuisance, advance door opening, door nudging, extend specific floor extended opening time, release trapped passengers

PART 2 - PRODUCTS

2.1 DESIGN AND SPECIFICATIONS

- A. Basis-of-Design Otis Elevator Company, Model Hydrofit 2500, with the following components:
 - 1. Sleep mode operation for LED ceiling lights and car fan.
 - 2. LED lighting standard in ceiling lights and elevator fixtures.
 - 3. Sleep mode operation for LED ceiling lights and car fan.
- B. Other Approved Manufactuers:
 - 1. Schindler Elevator Corporation.
 - 2. Thyssen Krupp.

2.2 EQUIPMENT: MACHINE COMPONENTS

- A. The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a low-pressure switch and a shut-off valve.
 - 1. The entire hydraulic system with hydraulic-fluid storage tank, power component and valves shall be located in the hoistway pit and be easily accessible for maintenance through an access door in the hoistway wall.
- B. A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.
 - 1. The controller shall be located together with the hydraulic system in the hoistway pit and be easily accessible for maintenance through the same access door that is also used for the hydraulic system.
- C. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
- D. Pressure Switch
- E. Low-oil control.

2.3 EQUIPMENT: HOISTWAY COMPONENTS

- A. Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
- B. Car Guide Rails: Tee-section steel rails with brackets and fasteners.
- C. Polyurethane type buffers shall be used.

- D. Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.
- E. Hoistway Entrances:
 - 1. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.
 - 2. Sills shall be extruded aluminum or bronze finish, or nickel silver finish.
 - 3. Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
 - 4. Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour.
 - 5. Entrance Finish: Satin stainless steel.
 - 6. Entrance marking plates: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
 - 7. Sight Guards: sight guards will be furnished with all doors painted to match with painted doors, painted black for stainless steel and gold satin doors.

2.4 EQUIPMENT: CAR COMPONENTS

- A. Cab: Steel Shell Cab with laminated vertical removable panels
 - 1. Paints and laminate to be selected from manufacturer's catalog of choices.
 - 2. Brushed Stainless Steel finished base plate located at top and bottom
 - 3. Laminate to other laminates used in the building.
- B. Car Front Finish: Satin Stainless Steel.
- C. Car Door Finish: Satin Stainless Steel.
- D. Ceiling Type: Dropped flat steel ceiling: Real White (EWO) with 6 LED lights.
- E. Emergency Car Lighting: An emergency power unit employing a 6-volt sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car in the event of building power failure.
- F. Fan: A one-speed 120 VAC fan will be mounted to the structural ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan.
- G. Handrail: Handrails shall be provided on the side and rear walls of the car enclosure. Handrails shall be 3/8" x 2" (9.5 mm x 51 mm) flat tubular handrail with a Brushed Steel.
- H. Threshold: Extruded Aluminum.
- I. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
- J. Guides: Car roller type guides at the top and the bottom.
- K. Platform: Car platform shall be constructed of metal.
- L. Certificate frame: Provide a Certificate frame with a satin stainless steel finish.
- M. The LED ceiling lights and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.
- N. Adhesives, sealants, paints and coatings applied within the building waterproofing envelope: Comply with low-emitting requirements in Division 01 Section "Indoor Air Quality Requirements."

- O. Resilient Flooring: Comply with RFCI FloorScore Program.
- P. Composite Wood and Laminating Adhesives (shop and field applied): Contain no added urea formaldehyde resins.

2.5 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a satin stainless steel finish.
- B. A car operating panel shall be furnished. It shall contain a bank of round stainless steel, mechanical LED illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served. All buttons to have raised numerals and Braille markings with:
 - 1. Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel.
- C. The car operating panel shall be equipped with the following features:
 - 1. Raised markings and Braille to the left hand side of each push-button.
 - 2. Car Position Indicator at the top of and integral to the car operating panel.
 - 3. Door open and door close buttons.
 - 4. Inspection key-switch.
 - 5. Elevator Data Plate marked with elevator capacity and car number.
 - 6. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
 - 7. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.
 - 8. In car stop switch
 - 9. Firefighter's hat
 - 10. Firefighter's Phase II Key-switch
 - 11. Call Cancel Button
- D. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
- E. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation.
 - 1. Integral Hall fixtures shall feature round stainless steel, mechanical buttons marked to correspond to the landings. Hall fixtures to be located in the entrance frame face or the wall. Buttons shall be in vertically mounted fixture. Fixture shall be satin stainless steel.
 - 2. Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel.
- F. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.
- G. Access key-switch at top floor in entrance jamb.

PART 3 - EXECUTION

3.1 PREPARATION

A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Installation by manufacturer, except as specifically provided for elsewhere by others.
- B. Welded Construction: Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.
- C. Sound Isolation: Mount rotating and vibrating elevator equipment and components on vibration-absorption mounts, designed to effectively prevent transmission of vibrations to structure and thereby eliminate sources of structure-borne noise from elevator system.
- D. Install piping without routing underground, where possible; where not possible, cover underground piping with permanent protective wrapping before backfilling.
- E. Lubricate operating parts of systems as recommended by manufacturer.
- F. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails, for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- G. Grout sills with non-staining, non-shrink grout. Set units accurately aligned with and slightly above finished floor at landings.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: Upon nominal completion of each elevator installation and before permitting use of elevator (either temporary or permanent), perform acceptance tests as required and recommended by Code, and also perform other tests, if any, as required by governing regulations.
- B. Advise Contractor, Owner, Architect and Inspection Department of governing agencies, in advance of dates and times, tests are to be performed on elevators.

3.4 PROTECTION

A. Installer shall advise contractor of recommended protection facilities and procedures to prevent damage and deterioration of completed elevator work (regardless of whether placed in temporary service) during remainder of construction period. Provide complete inspection and maintenance service for elevators in temporary service, if any, for period of such service.

3.5 INSTRUCTION DEMONSTRATION

A. Instruct Owner's personnel in proper use, operations and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions. Confer with Owner on requirements for a complete elevator maintenance program. B. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

END OF SECTION

SECTION 14 42 00 - WHEELCHAIR LIFTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Enclosed, self-contained vertical platform wheelchair lift.

1.2 REFERENCES

- A. ASME A17.1 Safety Code for Elevators and Escalators.
- B. ASME A17.5 Elevator and Escalator Electrical Equipment.
- C. ASME A18.1 Safety Standard for Platform Lifts and Stairway Chairlifts.
- D. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities.
- E. NFPA 70 National Electric Code.

1.3 SUBMITTALS

- A. Submit under provisions of Section 013000.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Submit manufacturer's installation instructions, including preparation, storage and handling requirements.
 - 2. Include complete description of performance and operating characteristics.
 - 3. Show maximum and average power demands.
- C. Shop Drawings:
 - 1. Show typical details of assembly, erection and anchorage.
 - 2. Include wiring diagrams for power, control, and signal systems.
 - 3. Show complete layout and location of equipment, including required clearances and coordination with shaftway.
- D. Selection Samples: For each finished product specified, provide two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finished product specified, two samples, minimum size 1-3/4" x 2-1/4" inches, representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firm with minimum 10 years experience in manufacturing of vertical platform lifts, with evidence of experience with similar installations of type specified.
- B. Installer Qualifications: Licensed to install equipment of this scope, with evidence of experience with specified equipment. Installer shall maintain an adequate stock of replacement parts, have qualified people available to ensure fulfillment of maintenance and callback service without unreasonable loss of time in reaching project site.

1.5 REGULATORY REQUIREMENTS

- A. Provide platform lifts in compliance with:
 - 1. ASME A18.1 Safety Standard for Platform Lifts and Stairway Chairlifts.
 - 2. ASME A17.1 Safety Code for Elevators and Escalators.
 - 3. ASME A17.5 Elevator and Escalator Electrical Equipment.
 - 4. NFPA 70 National Electric Code.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.7 PROJECT CONDITIONS

A. Do not use wheelchair lift for hoisting materials or personnel during construction period.

1.8 WARRANTY

- A. Warranty: Manufacturer shall warrant the wheelchair lift materials and workmanship for two years from date of Substantial Completion.
- B. Extended Warranty: Provide an extended manufacturer's warranty for the entire warranty period covering the wheelchair lift materials and workmanship for the following additional extended period beyond the initial two year warranty. Preventive Maintenance agreement required.
 - 1. Five additional years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Model Genesis Opal by Garaventa Lift; www.garaventalift.com.
- B. Other Approved Manufacturer: Symmetry Elevating Solutions.

2.2 ENCLOSED VERTICAL WHEELCHAIR LIFT

- A. Capacity: 750 lbs (340 kg) rated capacity.
- B. Mast Height: As indicated on the drawings.
- C. Nominal Clear Platform Dimensions:
 - 1. 44-1/4 inches by 59-3/4 inches.
- D. Platform Configuration:
 - 1. 90 Degree Entry/Exit: Front and side openings.
- E. Landing Openings:
 - 1. Lower Landing: Door.
 - 2. Upper Landing: Gate.
- F. Doors and Gates: Doors and gates shall be self closing type.
 - 1. Door Height: Flush mount, 80 inches (2032 mm).
 - 2. Gate Height: Flush mount, 42-1/8 inches (1070 mm).
 - 3. Door Construction: Aluminum frame with:
 - a. Panels of 16 gauge (1.5 mm) painted galvanized steel.
 - b. Panels of 3/16 inch (5 mm) clear Plexiglas with 16 gauge (1.5 mm) galvanized steel kick plate.
 - c. Panels of 3/16 inch (5 mm) bronze Plexiglas with 16 gauge (1.5 mm) galvanized steel kick plate.
 - d. Panels of 1/4 inch (6 mm) laminated safety glass with 16 gauge (1.5 mm) galvanized steel kick plate.
 - e. D-Handle Pull: 12 inch (305 mm) offset D-Handle.

- 4. Power Door/Gate Operator: Automatically opens the door/gate when platform arrives at a landing. Will also open at landing by pressing call button.
 - a. ADA Compliant and obstruction sensitive.
 - b. Low voltage, 24 VDC with all wiring concealed.
 - c. Location:
 - 1) Lower Landing: Door.
 - 2) Upper landing: Gate.
- G. Lift Components:
 - 1. Machine Tower: Custom aluminum extrusion.
 - 2. Base Frame: Structural steel.
 - 3. Platform Side Wall Panels: 42-1/8 (1070 mm) inches high. 16 gauge (1.5 mm) galvanized steel sheet. Custom aluminum extrusion tubing frame.
 - 4. Enclosure Panels:
 - a. 16 gauge (1.5 mm) painted galvanized steel sheet.
- H. Enclosure Height Above Upper landing:
 - 1. Enclosure shall extend 42-1/8 inches (1070 mm) above the upper landing level
- I. Infill Panel Kit: Provide 16 gauge (1.5 mm) galvanized panels and mounting hardware to cover void between side of enclosure, drive mast and adjacent wall at the following locations:
 - 1. Lower landing.
 - 2. Upper landing.
- J. Base Mounting and Access to Lift at Lower Landing:
 - 1. Floor Mount: Base of lift shall be mounted on the floor surface of the lower landing. For access onto the platform provide a ramp of 16 gauge (1.5 mm) galvanized steel sheet with a slip resistant surface.
 - 2. Pit Mount: Lift to be mounted in pit with dimensions to meet manufacturers requirements for the platform size specified. Pit construction shall be in accordance to Section 033000.
- K. Leadscrew Drive:
 - 1. Drive Type: Self-lubricating acme screw drive.
 - 2. Emergency Operation: Manual handwheel device to raise or lower platform.
 - 3. Battery Powered Emergency Lowering: Battery powered platform lowering device that automatically activates in the event of power failure. Allows passenger to drive platform downward to lower landing. Does not operate lift in up direction.
 - 4. Safety Devices:
 - a. Integral safety nut assembly with safety switch.
 - 5. Travel Speed: 10 fpm (3.0 m/minute).
 - 6. Motor: 2.0 hp (560 W).
 - 7. Power Supply:
 - a. 120 VAC single phase; 60 Hz on a dedicated 20 amp circuit.
- L. Platform Controls: 24 VDC control circuit with the following features.
 - 1. Direction Control: Constant pressure rocker switch.
 - 2. Direction Control: Illuminated tactile and constant pressure push buttons with dual platform courtesy lights and safety light.
 - 3. Illuminated and audible emergency stop switch shuts off power to lift and activates audio alarm equipped with battery backup.
 - 4. Keyless operation.
 - 5. Keyed operation.

- 6. Emergency Telephone: Platform shall be equipped with ADA compliant autodialer telephone with a stainless steel faceplate. Telephone shall operate in the event of power failure. A telephone line shall be supplied to the lift site as specified under Division 16.
- 7. Arrival Gong and Digital Floor Display.
- M. Call Station Controls: 24 VDC control circuit with the following features.
 - 1. Direction Control: Illuminated tactile and constant pressure push buttons with illuminated "In Use" indicator.
 - 2. Keyed operation.
 - 3. Call Station Mounting:
 - a. Lower:
 - 1) Wall mounted recessed.
 - b. Upper:
 - 1) Wall mounted recessed.
- N. Safety Devices and Features:
 - 1. Grounded electrical system with upper, lower, and final limit switches.
 - 2. Tamper resistant interlock to electrically monitor that the door is in the closed position and the lock is engaged before lift can move from landing.
 - 3. Pit stop switch mounted on mast wall.
 - 4. Electrical disconnect shall shut off power to the lift.
- O. Finishes
 - 1. Aluminum Extrusions: Champagne anodized finish.
 - Ferrous Components: Electrostatically applied baked powder finish, fine textured.
 a. Color: Satin Grey, RAL 7030.
 - 3. Lift Finish: Baked powder coat finish, color as selected by the Architect from manufacturers optional RAL color chart.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Do not begin installation until substrates have been properly prepared.
 - B. Verify shaft and machine space are of correct size and within tolerances.
 - C. Verify required landings and openings are of correct size and within tolerances.
 - D. Verify electrical rough-in is at correct location.
 - E. If substrate 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 substrate under the project conditions.
- 3.3 INSTALLATION
 - A. Install platform lifts in accordance with applicable regulatory requirements including ASME A 17.1, ASME A 18.1 and the manufacturer's instructions.
 - B. Install platform lifts in accordance with applicable regulatory requirements including CSA B355, and manufacturer's instructions.

- C. Install system components and connect to building utilities.
- D. Accommodate equipment in space indicated.
- E. Startup equipment in accordance with manufacturer's instructions.
- F. Adjust for smooth operation.
- 3.4 FIELD QUALITY CONTROL
 - A. Perform tests in compliance with ASME A 17.1 or A18.1 and as required by authorities having jurisdiction.
 - B. Schedule tests with agencies.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION