

Project Manual – Volume I

For Bid Pac G

New Dover High School

Dover, Delaware

EDiS Company, Inc.



Becker Morgan Group, Inc.



ARCHITECTURE
ENGINEERING

ABHA Architects



Capital School District



November 9, 2012

**Capital School District
New Dover High School
Bid Package 'G'**

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Public notice is hereby given that sealed bids for the following prime contract will be received for the construction of New Dover High School located in Dover, Delaware. Bids will be received at the Professional Development Administration Building located at 198 Commerce Way Dover, Delaware 19904-8210 until 3:00 pm local time on December 6, 2012, at which time they will be publicly opened and read aloud. *Bidder bears the risk of late delivery. Any bids received after the stated time will be returned unopened.* The time and location of the bid opening may be extended with a minimum of two (2) calendar days' notice to the Bidders.

Contract NDHS-33: Site, Field, Stadiums and Accessories
Contract NDHS-34: General Construction

Documents may be viewed and downloaded at the following FTP site after 4:00 PM on November 8, 2012:

bids.ediscompany.com
Log in: capitalhs
Password: edis0412

It is the responsibility of each bidder to review and coordinate all project documents. This includes plans, specifications and addendums. Please email Jackie McKee at jmmckee@ediscompany.com when you obtain documents via the FTP site so we can provide future bidding information to your company. Documents may be examined at the office of the Architect, ABHA 1621 N. Lincoln Street, Wilmington, DE 19806 the Construction Manager, EDiS Company, 110 S. Poplar Street, Suite 400, Wilmington, Delaware 19801; the office of Delaware Contractors Association, 527 Christiana Stanton Road, Newark, Delaware 19713; and F. W. Dodge Corporation, Conshohocken, Pennsylvania.

A bid security in the amount of 10% of the bid, plus consent of surety must accompany each bid. Bid Security shall specify the Owner as the obligee. Owner: Capital School District.

A pre-bid meeting will be held at Professional Development Administration Building located at 198 Commerce Way Dover, Delaware 19904-8210 on November 9, 2012 at 10:00 AM local time. Attendance is highly suggested but not mandatory.

Please contact EDiS Company, Kevin Lucas at 302-421-2893 or klucas@ediscompany.com with questions.

Conformance to the Delaware Architectural Accessibility Act and the standards of the Architectural Accessibility Board is required on the Project.

END OF SECTION

SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS

1. DEFINITIONS

- 1.1 Bidding Documents include the Contract Documents, Invitation to Bid, Instructions to Bidders, the Proposal Forms, Contract, General Conditions of the Contract, Supplementary Conditions, Specifications, Plans, and any Addenda issued prior to receipt of bids.
- 1.2 All definitions set forth in the General Conditions and the other Contract Documents are applicable to the Bidding Documents.
- 1.3 "Addenda" are written or graphic instruments issued by the Architect/Engineer prior to the receipt of bids which modify or interpret the Bidding Documents, by additions, deletions, clarifications or corrections. Addenda become part of the contract documents upon execution of the agreement.
- 1.4 The term Work is defined in 1.1.3 of the General Conditions.
- 1.5 A "Unit of Work" includes all Work covered by the one or more Sections of the specifications listed under that particular Unit of Work in Section 01 11 00 - SUMMARY OF WORK. A Unit of Work is the smallest portion of the Project for which a separate Bid will be accepted by the Construction Manager. The word "Unit" means "Unit of Work" whenever the context clearly implies "Unit of Work".
- 1.6 A "Bid" is a complete and properly signed proposal to do one or more Units of Work for the sum stipulated therein.
- 1.7 A "Bidder" is one who submits a Bid to the Bidding Agency for the Unit or Units of Work indicated therein.
- 1.8 A substantial amount of specification language constitutes definitions for terms found in other Contract Documents, including drawings, which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article. Definitions and explanations to this section are not necessarily either complete or exclusive, but are general for the work to the extent not stated more explicitly in another provision of Contract Documents.
- 1.9 General Requirements (or Conditions) apply to entire work of Contract and, where so indicated, to other elements which are included in the project.
- 1.10 The term "indicated" is a cross reference to details, notes or schedules on the Drawings, to other similar means of recording requirements in the Contract Documents. Where terms such as "shown", "noted", "schedule" and "specified"

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are used in lieu of "indicate," it is for purpose of helping to locate cross reference and no limitation of location is intended, except as specifically noted.

- 1.11 Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted" and "permitted" mean "directed by Construction Manager or Architect", "requested by Construction Manager or Architect", etc.
- 1.12 Where used in conjunction with Construction Manager's or Architect's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of the term "approved" will be held to limitations of Construction Manager's and Architect's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by Construction Manager or Architect be interpreted as a release of Contractor from responsibilities to fulfill requirements of the Contract Documents.
- 1.13 The "Project Site" is the space available to Contractor for performance of the Work, either exclusively or in conjunction with others performing other work as part of the Project. The extent of project site is shown on the Drawings and may or may not be identical with description of the land upon which project is to be built. The Contractor shall visit the site to verify contract or construction limits.
- 1.14 Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- 1.15 Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations as applicable in each instance.
- 1.16 Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- 1.17 An "Installer" is the entity, person or firm, engaged by the Contractor or his subcontractor or sub-subcontractor for the performance of a particular unit of work at the project site, including installation, erection, application and similar required operation. It is a general requirement that such installers be expert in operations they are engaged to perform.
- 1.18 The duties and obligations of the Contract apply to this Contractor (as defined herein) regardless of similar or identical duties or obligations of other Prime Contractors related to the Project. Therefore, even though other Prime Contractors may have similar, identical or overlapping duties and obligations, each and every duty and obligation set forth in this Contract is enforceable against this Contractor.

2. BIDDER'S REPRESENTATION

2.1 Each Bidder in submitting its bid represents that:

1. It has read and understands the Bidding Documents and its Bid is made in accordance therewith.
2. Contractor has visited the site; familiarized himself with the local conditions under which the work is to be performed; compared the site with drawings and specifications; satisfied himself of the conditions of delivery, handling and storage of materials and all other matters that may be incidental to the Work before submitting his Bid.
3. Its Bid is based upon the materials and equipment described within the Bidding Documents without exceptions.

2.2 EVIDENCE OF REPRESENTATION

1. Submission of a Bid will be considered as evidence of the bidder's representation. No allowance will subsequently be made to the successful contractor by reason of any error omission on his part, due to his neglect in complying with the requirements of this article.

3. BIDDING DOCUMENTS

3.1 ISSUANCE

1. Bidding documents will be available from the EDiS FTP site bids.ediscompany.com. It is the responsibility of the bidders to be aware and familiar with all Contract Documents including previously issued Bid Packages.
2. Bidding Documents will not be issued to subcontractors or other individuals or organizations who will not be contracting directly with the Owner.
3. The complete set of Bidding Documents shall be used in preparing bids; neither the Owner, the Architect nor the Construction Manager assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
4. The Owner, Architect, and the Construction Manager, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining bids on the Work and do not confer a license or grant for any other use.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

1. Bidders shall examine the Bidding Documents carefully and shall promptly notify the Construction Manager of any ambiguity, inconsistency or error which they may discover. No request for adjustment of Contract Time or Sum shall be permitted with regard to any purported ambiguity, inconsistency or error not promptly noticed to the Construction Manager.
2. Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Construction Manager to reach him at least seven days prior to the date of receipt of bids.
3. Any interpretation, correction or change of the Bidding Documents will be made by Addendum. Interpretations, corrections, or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections, and changes.

3.3 SUBSTITUTIONS

1. Refer to Specification Section 01 62 00 - MATERIAL AND EQUIPMENT.
2. Substitution requests must be made at least seven (7) days prior to the receipt of bids.

3.4 ADDENDA

1. Addenda will be available at the FTP site; email will be used to notify each bidder of the addendums issued.
2. Sub-Bidders, Suppliers, Manufacturers and others wishing to have Addenda mailed free of charge directly to them should address a letter to the Construction Manager requesting a listing on the Addenda mailing list for this Project. Such letter must include no other subject matter, must clearly identify this Project by name, and must indicate, line for line, exactly how the name and address is to be typed on the envelope. Phone requests will not be accepted. The Construction Manager will endeavor, but expressly does not promise, to mail Addenda directly to those who have properly requested. Such mailing list is for this one Project only.
3. Addenda issued during the time of bidding shall be listed on Bid form in the space provided. Failure of a Bidder to receive any Addendum shall not release the Bidder from any obligations under his Bid, provided said addendum was

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sent by fax or by U.S. Mail to the address furnished by the bidder for transmittal of mail. Faxed Addenda will be confirmed by U. S. Mail.

4. No Addenda will be issued later than three (3) days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which extends the time or changes the location for the opening of Bids.

4. BIDDING PROCEDURE

4.1 FORM AND STYLE OF BIDS

1. Bids shall be submitted in triplicate upon the proposal form included in these specifications, or upon an exact copy of it.
2. The Bidder shall complete all blank spaces on the Bid form.
3. Where indicated on the Bid form, sums shall be expressed in both words and figures. In case of discrepancy between the two, the written amount shall govern.
4. Any interlineation, alteration or erasure of an entry made in a blank space of the form must be initialed by the signer of the Bid. However, no interlineation, alteration or erasure shall be made in the wording printed on the bid form unless the Bidder is instructed by the Bidding Documents to do so. The Bidders shall add no stipulations or qualifications on the Bid form or accompanying the bid form unless permitted by or instructed by the Bidding Documents to do so.
5. All requested quantities, unit prices and alternates shall be included as part of the bid.
6. All signatures shall be in long hand.
7. The Bidder shall include on the Bid Form, within the Base Bid total costs associated with providing both the Labor and Material Payment and Performance Bonds.
8. The Bidder shall affix his seal to the bid form, if organized as a corporation.

4.2 SUBMISSION OF BIDS

1. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids indicated in the Invitation to Bid, or any extension thereof made by Addendum. The time and location of the bid opening may be extended with a minimum of two (2) calendar days notice to the Bidders. Bids received

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after the time and date for receipt of Bids will be marked "LATE BID" and returned.

2. The Bid Proposal (3 copies) shall be enclosed in a sealed envelope. The envelope shall be addressed to the Owner, and shall be identified with the Project name, the Bidder's name and address and the Unit of Work included in the Bid.
3. If the Bidder submits his Bid by mail, he shall enclose the above described sealed envelope in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof.
4. Bids shall include a fully executed Bid Bond, Power of Attorney, Non-collusion Statement, Consent of Surety and Subcontractor listing.

4.3 MODIFICATION OR WITHDRAWAL OF BID

1. A Bidder may modify his Bid in writing at any time prior to the time scheduled for receiving Bids, provided such written modification is received by the Construction Manager prior to said time.
2. Unless specifically authorized, faxed bids will not be considered.
3. No Bidder shall modify, withdraw or cancel his Bid or any part thereof for ONE HUNDRED TWENTY (120) days after the time designed for the receipt of Bids, in the Invitation to Bid. Any further extension of the time will be by mutual consent of the Owner and the Contractor.
4. A Bid may be withdrawn up until the time scheduled for receiving the Bids. Such withdrawal shall be in writing.

5. CONSIDERATIONS OF BIDS

5.1 OPENING OF BIDS

1. Bid shall be publicly opened and read aloud.

5.2 REJECTION OF BIDS

1. The Owner, in its sole discretion, shall have the right to reject any or all bids for any reason or for no reason whatsoever.

5.3 ACCEPTANCE OF BIDS

1. The Owner, in its sole discretion, shall have the right to waive any informality

or irregularity in any Bid received.

2. The Owner shall have the right to accept Alternates in any order or combination.

6. SUBCONTRACT INFORMATION

6.1 SUBMISSION OF SUBCONTRACTOR LIST

1. Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount *). The Agency may determine to deduct payment of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All penalty amounts assessed and not refunded or remitted to the Contractor shall be reverted to the State.

* one (1) percent of the contract amount not to exceed \$10,000.

2. Upon request of the Construction Manager, the Bidder shall within seven (7) days of the request submit a list of the other subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) if any, proposed for the various portions of the Work not included in the subcontractors list submitted with the bid.
3. The Bidder will be required to establish to the satisfaction of the Construction Manager the capability and experience of all proposed subcontractors to furnish and perform the work described in the sections of the specifications pertaining to such proposed subcontractor's respective trades.
4. Subcontractors and other persons and organizations proposed by the Bidder and accepted by the Owner must be used on the work for which they were proposed and accepted, and shall not be changed except with the written approval of the Construction Manager.

7. EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

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

- 7.1 The Contractor will not discriminate against any employee or applicant for

employment because of race, creed, color, sex or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated 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, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

- 7.2 The Contractor will, in all solicitants 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 sex, or national origin.
- 7.3 The term "Contract for public works" means construction, reconstruction, demolition, alteration and repair work and maintenance work paid for, in whole or in part, with public funds.
- 7.4 The Secretary of the Department of Labor shall be responsible for the administration of this section and shall adopt such rules and regulations and issue such orders as he deems necessary to achieve the purpose thereof, provided that no requirement established hereby shall be in conflict with subchapter 6904 of this title.

8. PREVAILING WAGE REQUIREMENT

- 8.1 Wage Provisions: In accordance with Delaware Code, Title 29, Section 6960, renovation projects whose total cost shall exceed \$15,000 and \$100,000 for new construction, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.
- 8.2 The prevailing wage shall be the wage paid to a majority of employees performing similar work as reported in the Department's annual prevailing wage survey or in the absence of a majority, the average paid to all employees reported.
- 8.3 The Contractor shall pay all mechanics and labors employed directly upon the site of work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.

- 8.4 The scale of the wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work.
- 8.5 Every contract based upon these specifications shall contain a stipulation that certified sworn payroll reports be maintained by every Contractor and Subcontractor performing work upon the site of construction. The Contractor and Subcontractor shall keep and maintain the sworn payroll information for a period of 2 years from the last day of the work week covered by the payroll. A certified copy of these payroll reports shall be made available: 1) Effective June 30, 2007, all Contractors performing work on public work projects are required to furnish sworn payroll records on a weekly basis to the Department of Labor. Specifically, 29 Del. C. § 6960(c) states that "(e)very contract... shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly." Further, that "(t)he Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll." Lastly, the failure to submit payroll reports shall be subject to a civil penalty of not less than \$1,000 nor more than \$5,000 for each violation. 29 Del. C. § 6960(e). Sworn payroll information shall consist of a fully completed and notarized report on a form provided upon request by the Department of Labor. *See Delaware Prevailing Wage Regulations VII A.2(c)*"; 2) upon request by the public or for copies thereof. However, a request by the public must be made through the Department of Labor. The requesting party shall, prior to being provided the records, reimburse the costs of preparation by the Department of Labor in accordance with the Department's copying fee policy. The public shall not be given access to the records at the principal office of the Contractor or Subcontractor; and 3) the certified payroll records shall be on a form provided by the Department of Labor or shall contain the same information as the form provided by the Department and shall be provided within 10 days from receipt of notice requesting the records from the Department of Labor.

9. PERFORMANCE AND PAYMENT BONDS

- 9.1 The Contractor shall be required to furnish bonds covering the faithful performance of the contract and the payment of all obligations arising thereunder with such sureties secured through the Bidder's usual sources as may be agreeable to the parties. The Owner shall be noted as the obligee.
- 9.2 The performance and payment bonds shall each be in an amount equal to 100% of the Contract Sum as adjusted from time to time. The Owner shall be noted as the obligee.
- 9.3 TIME OF DELIVERY AND FORM OF BONDS
1. The Bidder shall deliver the required bonds within seven (7) days from receipt of request from the Construction Manager.

**Capital School District
New Dover High School
Bid Package 'G'**

2. The performance and payment bonds shall be written in the form found in Section 00 61 13 Performance and Payment Bonds.
3. The required bonds shall be by an authorized agent of the bonding company and shall be accompanied by a certified and current copy of the bonding agent's Power of Attorney, indicating the monetary limit of such power. The bonding company shall be licensed to operate in the state which the work is to be performed.

10. EXECUTION OF AGREEMENT

- 10.1 The Agreement will be written on a contract form, stipulated by the Owner, a copy of which is included in the Specifications.
- 10.2 The Bidder shall, within seven (7) days following its presentation, execute the Agreement and return it to the Construction Manager.
- 10.3 The Bidder agrees to commence work within seven (7) days of 1) execution of the Agreement, or 2) receipt of a Letter of Intent to execute the Agreement, or other authorization to proceed, if furnished at an earlier date.
- 10.4 If the successful Bidder fails to execute the required Contract and Bond, as aforesaid, within twenty (20) days after the date of official Notice of the Award of the Contract, their Bid guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a forfeiture or as a penalty. Award will then be made to the next lowest qualified Bidder of the Work or readvertised, as the Agency may decide.

11. GENERAL COMMENTS

11.1 JOINT VENTURE AGREEMENTS

In the event of a mandatory pre-bid meeting, representatives of both Joint Ventures must attend the pre-bid meeting and must be an officer and co-joint venture of the corporations involved.

Each Joint Venture shall be qualified and capable to complete the project with their own forces.

Included with the bid submission, and as a requirement to bid, a copy of the executed Joint Venture Agreement shall be submitted and signed by all Joint Ventures involved.

All required bid bonds, performance bonds, material and labor payment bonds must be executed by both Joint Ventures and be placed in both of their names.

All required insurance certificates shall name both Joint Ventures.

Both Joint Ventures shall sign the bid form and shall submit a valid Delaware Business License Number with their bid or shall state that the process of application for a Delaware Business License has been initiated.

Both Joint Ventures shall include their Federal E. I. Number with the bid.

Due to exceptional circumstances and for good cause shown, one or more of these provisions may be waived at the discretion of the Owner.

11.2 LICENSE APPLICATION REQUIRED TO BID

A business license application must be initiated prior to or in conjunction with the submission of a bid on competitively bid contracts exceeding \$50,000; or in the case of a subcontractor, prior to the submission of a bid by the general contractor. The license application procedure may be initiated by visiting or calling the Division of Revenue.

11.3 BONDING REQUIREMENTS FOR NON-RESIDENT CONTRACTORS

All non-resident contractors are reminded that they must supply a surety or cash bond to the Division of Revenue equal to six percent (6%) of the total of all contracts exceeding \$20,000 for construction within this state. For Division of Revenue purposes, cash bonds and bank letters of credit issued by financial institutions will be accepted on all contracts.

11.4 CONTRACT AWARD TO NON-RESIDENT CONTRACTORS

Every architect, or professional engineer or contractor or construction manager engaging in the practice of such profession shall furnish the Department of Finance within 10 days after entering into any contract with a contractor or subcontractor not a resident of this State, a statement of the total value of such contract or contracts together with the names and addresses of the contracting parties.

11.5 STATE LICENSE AND TAX REQUIREMENTS

The Contractor and Subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, "the Contractor shall furnish the State Tax Department within ten (10) days after award of the Contract, a statement of the total values of each contract and subcontract, together with the names and addresses of the contracting parties . . ."

11.6 RIGHT TO AUDIT RECORDS

The Owner (contracting agency) shall have the right to audit the books and records of a Contractor or any Subcontractor under any Contract or Subcontract to the extent that the books and records relate to the performance of the Contract or Subcontract.

Said books and records shall be maintained by the Contractor for a period of three (3) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of three (3) years from the date of final payment under the Subcontract.

END OF SECTION

SECTION 00 31 32 – GEOTECHNICAL DATA

1. GENERAL

1.1 Owner's Disclaimer

- A. Site Information: Data on subsurface conditions are made available in the Bidding Documents as a convenience to Bidders and the Contractor. They are not intended as representations or warrants of continuity of such conditions between soil borings. It shall be expressly understood that the Owner will not be responsible for interpretations or conclusions drawn therefrom by the Contractor. Additional test borings and other exploratory operations may be made by the Contractor at no additional cost to the Owner, provided such operations are acceptable to the Architect and Construction Manager.

1.2 SOIL BORING DATA

- A. Attached is the Geo-Technical Reports provided by Duffield Associates.

GEOTECHNICAL EVALUATION

DOVER HIGH SCHOOL CAPITAL SCHOOL DISTRICT DOVER, DELAWARE

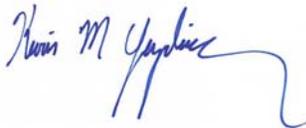
December 2010

Prepared for:

Becker Morgan Group, Inc.
309 South Governors Avenue
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Prepared by:

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Project No. 8715.GC

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EXECUTIVE SUMMARY

This report summarizes Duffield Associates, Inc.'s (Duffield Associates) geotechnical evaluation for the proposed Dover High School campus to be located approximately 3.1 miles west of North DuPont Highway along State Road 8 (Forrest Avenue) in Dover, Delaware. The proposed construction includes a three-story high school, single-story field house, stands, various stormwater management facilities, site pavements, as well as several athletic fields. The high school and field house structures are anticipated to encompass footprints of approximately 235,000- and 10,000-square feet, respectively, and to be supported on shallow foundation and slab-on-grade systems (i.e., no basement level).

The project site consists of approximately 106.3 acres of undeveloped agricultural land. A manmade agricultural ditch extends in a southeast-to northwest orientation across the site. A proposed site grading plan was not available at the time of this evaluation. However, it is understood that only minor regrading (i.e., net "cuts" and "fills") on the order of 2 to 4 feet or less will be required to achieve the proposed site grades.

A total of twenty-nine (29) Standard Penetration Test borings extending to depths ranging from 5 to 50 feet below the ground surface, eleven (11) test pits extending to depths of up to 14.5 feet below the ground surface and four (4) single-ring infiltration tests were performed at the site between November 3 and 23, 2010. Beneath a surficial layer of topsoil, the subsurface conditions observed can generally be described as soft to stiff consistency silt or clay underlain by predominately very loose to medium dense silty sand. Groundwater was observed during performance of the field program at depths ranging from approximately 3.5 to 11.5 feet below the existing ground surface, corresponding to elevations ranging from approximately 46.3 to 39 feet, project datum.

In general, with the exception of the biofiltration swales proposed within the locations of I-4 and I-5, Duffield Associates generally does not recommend the utilization of infiltration practices at this site due to the generally shallow groundwater conditions observed, elevations of seasonal high water indications, and observed infiltration testing results.

Based on the observed subsurface conditions and the provided and assumed loading information, it is Duffield Associates' opinion that the proposed structures could be supported on shallow foundation systems and slabs-on-grade. A maximum net allowable bearing pressure of 2,500 pounds per square foot is recommended for the design of all foundations. Total foundation settlement is estimated to be on the order of 1 inch for the field house and stands and 1½ inches for the high school.

Post-construction settlement is estimated to be ½ inch or less, with differential settlements between typical column or wall spacing within the footprint of the structures estimated to be ½ inch or less between adjacent columns or walls. Foundations should be supported on the predominately loose to medium dense apparent "natural" silty sand soil of Stratum C generally observed beneath Strata A and B (i.e., topsoil and silt or clay soils) or on compacted structural fill as recommended herein.

More detailed conclusions and recommendations for design and construction of the foundations, floor slabs and site pavements, as well as the stormwater management areas for the proposed site are provided in the following report.

I. INTRODUCTION

This report summarizes Duffield Associates, Inc.'s (Duffield Associates) geotechnical evaluation for the proposed Dover High School campus to be located approximately 3.1 miles west of North DuPont Highway along State Road 8 (Forrest Avenue) in Dover, Delaware. Included in this report is a summary of the data obtained during field and laboratory testing programs and a discussion of the subsequent geotechnical analysis. Recommendations for the design and construction of proposed building foundations, slabs, site pavements, and stormwater management areas are also provided. These services were performed in general accordance with an agreement between Duffield Associates and the Becker Morgan Group, Inc. (Becker Morgan), dated June 28, 2010, authorized to proceed on October 25, 2010.

To assist with the preparation of this report, Duffield Associates was provided with the following documents:

- A request for a subsurface and geotechnical engineering report prepared by the project's structural engineer, Baker, Ingram & Associates, dated June 1, 2010, delivered via electronic mail on June 1, 2010; and
- A sketch titled "Boring Locations – As Staked 2010-10-29," prepared by Becker Morgan, dated October 21, 2010, delivered via electronic mail on November 2, 2010, indicating the proposed site layout, existing topography and proposed sampling locations.

Based on discussions with the project team and the information provided, it is understood that it is proposed to construct a three-story high school, single-story field house, stands (i.e., bleachers along the east and west sides of the football field), various stormwater management facilities (i.e., two (2) ponds, six (6) biofiltration basins and one (1) biofiltration swale), site pavements (i.e., access drives and parking lots), as well as several athletic fields (i.e., 9 to 11 playing fields designated for football, soccer, field hockey, softball and baseball). Further, it is understood that an initially proposed "remote athletic structure" to consist of a relatively small building similar to the proposed field house is currently not being considered as part of the proposed project development.

The high school and field house structures are anticipated to encompass footprints of approximately 235,000- and 10,000-square feet, respectively. It is anticipated that the high school building structure will be supported on a shallow foundation and slab-on-grade system (i.e., no basement level). The proposed structure is to consist of steel and composite steel floor framing, concrete masonry block and cold-formed steel stud walls, and brick veneer construction. The remote field house is anticipated to be supported by shallow foundations, masonry bearing walls, and concrete framing construction. The football stands are proposed to be supported by a shallow foundation system.

The referenced request for subsurface and geotechnical engineering report provided the following anticipated loading conditions:

	Maximum Wall Loads (kips/linear foot)	Maximum Column Loads (kips)
High School	5	240
Remote Athletic Structure	3	0

No structural loading information for the proposed football stands was available at the time of this evaluation. Therefore, maximum column loads on the order of 50 kips have been assumed.

Becker Morgan indicated that the proposed high school and field house are anticipated to have finished floor elevations of 49.5 feet, project datum. It was indicated that the finished floor of the high school may be increased to elevation 50 feet depending on the finalized stormwater management design. A proposed site grading plan was not available at the time of this evaluation. However, it is understood that only minor regrading (i.e., net “cuts” and “fills”) on the order of 2 to 4 feet or less will be required to achieve the proposed site grades.

At the time of this evaluation the project site consisted of approximately 106.3 acres of undeveloped agricultural land. A manmade agricultural ditch extends in a southeast-to northwest orientation across the site. Duffield Associates previously performed a wetlands evaluation report for Becker Morgan titled “Subaqueous Lands, Waters of the U.S. including Wetlands Evaluation Report, Capital School District – Proposed Dover High School Property,” dated July 6, 2010, which concluded that the agricultural ditch was not classified as “wetlands” based on the methodology utilized to prepare the report. Duffield Associates submitted this report to the U.S. Army Corps of Engineers and to the State of Delaware at the request of Becker Morgan to determine if the water bodies on the property are jurisdictional and subjected to Federal or State laws. The U.S. Army Corps of Engineers and the State of Delaware indicated via written correspondence on November 4, 2010 and September 1, 2010, respectively that they agreed with Duffield Associates’ conclusion and that no jurisdictional governance was applicable by either agency.

The site is relatively flat with existing elevations ranging from 45 to 55 feet, project datum. Generally, the site grades increase away from the agricultural ditch (i.e., east-to-west of the ditch) and from north-to-south across the site. The site is bound to the south by residential development including a large stormwater management pond, the southwest by agricultural land, the north by State Road 8 and residences adjacent to the south side of the road, and by undeveloped land to the northeast. An apparent farmhouse previously existed within the eastern half of the site but was demolished prior to the start of this field evaluation. However, the farmhouse driveway was still present and extends in a north-to-south orientation connecting to State Road 8.

Overhead utilities were present, crossing the majority of the project site in two different orientations (see the Sampling Location Sketch included in Appendix A for an approximate location). No underground utilities were located within the project site as a result of contacting Miss Utility prior to the start of the field work. It is understood that several underground utilities may be present within approximately 50 feet south of State Road 8 along the northern boundary of the site. However, this was not within the general area of the field exploration program. A terracotta pipe (apparent field drainage pipe) was encountered during the performance of test pit Nos. I-1A and I-2 at depths corresponding to 2.5 and 2 feet below the existing ground surface respectively. Although only observed at these two (2) sampling locations, it is anticipated that similar field drainage pipe may be present elsewhere on the site.

II. FIELD AND LABORATORY TESTING PROGRAMS

A. STANDARD PENETRATION TEST BORINGS

A total of twenty-nine (29) Standard Penetration Test borings (performed in general accordance with ASTM D 1586), extending to depths ranging from approximately 5 to 50 feet below the ground surface, were performed at the site from November 15 to 23, 2010. The test borings, designated as TB-S1 through TB-S13 (for structural borings), TB-B1 through TB-B10 (for civil site borings), and TB-R1 through TB-R6 (for roadway borings) were performed at locations as staked in the field by Becker Morgan prior to the start of the field evaluation. These locations were observed to be accessible to the drill rig and clear of existing utilities. The approximate test boring locations are indicated on the Sampling Location Sketch.

The test borings were performed by Feldmann Brothers, Inc. of Newark, Delaware, as a subcontractor to Duffield Associates, utilizing an ATV-mounted Diedrich D-50 drill rig with hollow-stem augers. Approximately twenty (20) of the test borings were performed utilizing mud-rotary drilling techniques. Duffield Associates' representative was present to review the performance of the test borings. Test boring logs, which describe the conditions observed during the field exploration program, are included in Appendix B.

At completion of the drilling, the boreholes were backfilled with the soil cuttings. Excess soil was mounded above the boring locations to compensate for potential future settlement of the boring backfill. However, additional settlement and softening of the soils replaced in the boreholes may occur, resulting in depressions or holes in the ground surface. Consequently, future maintenance and restoration of the site may be required.

B. BACKHOE EXCAVATED TEST PITS

The evaluation also included the performance of eleven (11) test pits designated as TP-1 through TP-5 and I-1A through I-6 performed on November 3 and 9, 2010, respectively. The test pits were performed by Feldmann Brothers, Inc. of Newark, Delaware as a subcontractor to Duffield Associates, utilizing a rubber-tired backhoe.

The test pits were extended to depths of up to 14.5 feet below the existing ground surface. Test pit locations were staked in the field by Becker Morgan prior to the start of the field evaluation. Ten (10) of the test pits were performed within the proposed stormwater management areas. Infiltration testing was performed in four (4) of the test pit locations. One (1) test pit was performed within the proposed athletic fields. A sketch indicating the approximate locations of the test pits is enclosed in Appendix A.

Duffield Associates' representative was present to review the performance of the test pits. Test pit logs, describing the conditions observed during the field exploration program, are included in Appendix B. At completion of the test pits, the excavations were backfilled with the excavated material and leveled with the existing ground surface. Settlement and softening of soils replaced in the test pits may occur, resulting in a depression or holes in the ground surface. Consequently, future maintenance and restoration of the site may be required.

C. INFILTRATION TESTING

A total of six (6) infiltration tests were initially proposed to be performed during the field evaluation. On November 3, 2010, five (5) test pit excavations were performed at the site. Four (4) of these test pits were performed within proposed stormwater management areas in an effort to evaluate conditions related to seasonal high groundwater level and groundwater seepage prior to performing infiltration testing. Following the performance of these test pits, Duffield Associates provided the project civil engineer (Becker Morgan) with preliminary field observations of seasonal high groundwater, groundwater seepage, and stratigraphy via electronic mail on November 4, 2010. These preliminary observations were discussed between Duffield Associates and Becker Morgan on November 5, 2010, and the initially proposed scope modified.

A total of (4) single-ring infiltration tests were performed at the project site at test pit location Nos. I-2, I-3, I-4 and I-5. The single-ring infiltration tests were performed in general accordance with ASTM D 3385 and D 5126. At the completion of the infiltration tests, additional excavation was performed with the backhoe to further evaluate the stratigraphy and the relative saturation over depth. Test pit logs, which describe the conditions observed during the field exploration program, are included in Appendix B. At completion of the test pits and

infiltration test operations, the test pits were backfilled with the excavated soil as described above. Results from the infiltration testing are provided below within the “Discussion of Analysis” section and Infiltration Testing Plots are located in Appendix B.

D. LABORATORY TESTING

Following completion of the field program, soil samples were returned to Duffield Associates’ laboratory for testing of selected samples. The laboratory testing program for this evaluation included the determination of natural water content (ASTM D 2216), and silt/clay content (percent finer than a No. 200 sieve, ASTM D 1140) for a total of seventeen (17) soil samples and the performance of Atterberg Limits (liquid and plastic, ASTM D 4318) determinations for a total of three (3) soil samples obtained during the field evaluation. The laboratory testing program also included the determination of percent finer than a No. 270 sieve [silt/clay content in accordance with the United States Department of Agriculture (USDA) classification system] for four (4) soil samples obtained from the infiltration test locations. The results of these laboratory tests are included on the test boring and test pit logs included in Appendix B. No environmental testing or characterization was performed.

III. SUBSURFACE CONDITIONS

A. GENERALIZED SITE GEOLOGY

Regional geologic mapping by the Delaware Geologic Survey (DGS) indicates that the project site is located within the Atlantic Coastal Plain Physiographic Province. A review of geologic map Series No. 14 titled “Geologic Map of Kent County, Delaware,” prepared by DGS, dated 2007 indicates that the surficial geology of the site is comprised of the middle Pleistocene Aged Columbia Formation. This formation is defined as fine to coarse, feldspathic quartz sand with varying amounts of gravel. Scattered beds of clayey silt are common. This stratigraphic unit is less than 50 feet thick and is interpreted to be primarily a body of fluvial glacial outwash sediment. This formation is underlain by the lower to middle Miocene Aged Calvert Formation. This formation is defined as clayey silt to silty clay interbedded with silty fine to coarse quartz sands and interpreted to be a marine deposit. Three major aquifers are located within the Calvert Formation within Kent County, Delaware. The project site is located within the Frederica Aquifer System Subgroup. This Calvert Formation ranges up to 425 feet in thickness.

B. STRATIGRAPHIC CONDITIONS

Beneath a surficial layer of topsoil, the subsurface conditions observed can generally be described as soft to stiff consistency SILT/CLAY underlain by very loose to medium dense silty sand. This silty sand stratum was only fully penetrated within sampling locations TB-S1 and TB-S9 which were extended to a depth of 50 feet below the existing ground surface. Within these test borings the silty sand stratum was underlain by a layer of medium to stiff consistency silt. This predominately fine-grained soil was underlain by medium to dense silty sand to the extent of the two (2) deeper test borings. The subsurface conditions encountered can generally be described as follows:

Stratum	Approximate Thickness (feet)	Generalized Description ^[1]
A ^[2]	0.4 – 1.1	TOPSOIL (approximately 5 to 13 inches)
B ^[3,4]	0.4 – 3.5	Light brown, gray, orange SILT or CLAY, trace to and fine sand, trace to little medium to coarse sand, trace to little gravel, trace organics (e.g., root material) (dry to moist, soft to stiff consistency); USCS: ML, CL
C ^[2,5]	33 – 35.5	Orange-brown, light gray, yellow, white, black fine to medium SAND, trace to and silt/clay, trace to and gravel, trace to some coarse sand (moist to wet, very loose to medium dense); USCS: SM, SC
D ^[5]	5 – 10	Dark gray SILT, trace to and fine sand (moist, medium stiff consistency); USCS: ML
E ^[6]	-- ^[7]	Dark gray, white, orange fine SAND, little to some silt, trace to little medium to coarse sand (wet, medium to dense); USCS: SM
<p>Notes: 1. The soil descriptions utilized herein and on the test boring and test pit logs are defined by the General Notes enclosed in Appendix C.</p> <p>2. Stratum encountered within all sampling locations.</p> <p>3. Stratum not encountered within sampling locations TP-4, TB-R1 through TB-R4, TB-R6, TB-B7, TB-B9, TB-B10, TB-S3, TB-S7, TB-S11 and TB-S12.</p> <p>4. Stratum interbedded within Stratum C within sampling locations TB-S4 and TB-B1.</p> <p>5. Stratum only fully penetrated within sampling locations TB-S1 and TB-S9.</p> <p>6. Stratum not fully penetrated at any sampling location.</p>		

Groundwater observations made during the performance of the test borings and test pits are indicated on the logs included in Appendix B. Groundwater was observed during performance of the field program at depths ranging from approximately 3.5 to 11.5 feet below the existing ground surface, corresponding

to elevations ranging from approximately 46.3 to 39 feet (project datum). Groundwater levels at the site are likely to be affected by seasonal and annual variations in precipitation. It is estimated that variations in groundwater levels several feet higher or lower than those observed by this evaluation could be experienced during extreme variations in precipitation.

Groundwater mapping by DGS and the current State of Delaware, Department of Natural Resources and Environmental Control (DNREC) well permit database indicates groundwater levels in “normal,” “dry,” and “wet” conditions range from approximately 7 to 13 feet below the existing ground surface. The borings for this evaluation were performed during a relatively “dry” to “normal” period, and appear consistent with the database information.

IV. DISCUSSION OF ANALYSIS

A. PROPOSED STRUCTURES

Proposed High School

The proposed footprint of the high school is situated within the northwestern third of the site. As discussed, an existing agricultural ditch bisects the majority of the western and southern portions of the proposed high school footprint. It was observed that the existing site grading generally sloped towards the agricultural ditch. During the field evaluation, existing terracotta field drainage pipes apparently installed to facilitate field drainage towards the ditch were observed. The proposed finished floor elevation of the high school is anticipated to be 49.5 feet, project datum. To achieve this elevation “fills” on the order of up to 4 feet will be required. In general, the areas of the largest fills required to achieve the proposed finished floor elevation are located within the vicinity of the ditch and within the western and northwestern portions of the high school.

Proposed Field House

It is proposed to locate the field house within the eastern-third of the site adjacent to a proposed parking area located off of the main site access drive (see Sampling Location Sketch within Appendix A). It is understood that a location just north of the football field and south of the southeastern extent of the high school is also being considered. Analysis of this structure is based on the currently proposed location. The proposed finished floor elevation for this structure is anticipated to be 49.5 to 50 feet, project datum. The provided topographic information indicates that the existing site grades at this location are at approximately elevation 52 feet, project datum. Therefore, cuts on the order of 2 to 2.5 feet are anticipated to achieve the proposed finished floor elevation.

Proposed Football Field Stands

Two (2) areas of stands (i.e., bleachers) are proposed to extend in a north-to-south orientation along the eastern and western sides of the football and track and field area located southeast of the high school. The western stands are anticipated to be 1.5 to 2 times greater in plan area than the eastern stands. At the time of this evaluation, specific information (i.e., dimensions, framing and anticipated loading conditions) were not available for these structures. Therefore, a maximum column load (i.e., dead plus live loads) of 50 kips was assumed.

B. FOUNDATIONS

Based on the subsurface data obtained during this evaluation, it is Duffield Associates' opinion that the predominately loose to medium dense apparent "natural" silty sand soil of Stratum C, generally observed beneath Strata A and B (i.e., topsoil and silt or clay soils), is generally suitable for supporting the proposed structures on a shallow spread foundation system and slab-on-grade construction.

Structural fill, placed over suitable soils and compacted, as recommended in this report, is also considered suitable for supporting a shallow foundation system. Analysis indicates that the building foundations bearing on the Stratum C soils or on compacted structural fill could be sized for a maximum allowable bearing pressure of 2,500 pounds per square foot (psf). This analysis has assumed a shallow foundation system with a minimum width of 3 feet for isolated footings and 2 feet for continuous footings, and a minimum burial depth of 18 inches for interior footings and 24 inches for exterior footings.

Estimates of foundation settlement were performed to aid in evaluating the effects of the provided and assumed structural loads on the subsurface conditions. Based on this analysis, total foundation settlement is estimated to be on the order of 1 inch for the field house and stands and 1½ inches for the high school. Due to the presence of predominately granular soils beneath the proposed foundations, most of the estimated settlement should occur relatively quickly following the application of loads. Post-construction settlement is estimated to be ½ inch or less, with differential settlements between typical column or wall spacing within the footprint of the structures estimated to be ½ inch or less between adjacent columns or walls. These magnitudes of total and differential settlement are generally considered to be within tolerable limits for the types of structures proposed. However, the actual settlement tolerances of the structures should be verified with the project's structural engineer. If actual loading and/or grading conditions vary significantly from the assumptions of this analysis, Duffield Associates should be contacted to review and possibly modify this analysis.

C. GROUNDWATER CONSTRUCTION CONSIDERATIONS

Groundwater was observed at a range of depths between approximately 3.5 to 11.5 feet below the existing ground surface, corresponding to elevations ranging from approximately 46.3 to 39 feet (project datum). Groundwater levels at the site are likely to be affected by seasonal and annual variations in precipitation. It is estimated that variations in groundwater levels several feet higher or lower than those observed by this evaluation could be experienced during extreme variations in precipitation. Therefore, depending on seasonal variations in precipitation, it is possible that groundwater could be encountered during shallow foundation construction for the proposed structures resulting in wet conditions and seepage during construction. Additionally, groundwater may be encountered within and adjacent to the existing agricultural ditch during construction.

Based on the relatively shallow groundwater conditions observed during the field evaluation and the presence of standing water within the existing agricultural ditch, it appears that groundwater control methods will need to be utilized at the site in order to facilitate the proposed construction. Typically, dewatering during construction can be accomplished using a series of localized sumps installed along the length of an excavation during shallow foundation construction. Well points could also be considered for deeper excavation, utility construction, etc. Groundwater collected during construction should be discharged in accordance with local regulatory requirements. If lowering of the groundwater table is performed during construction, the effects on nearby structures should also be monitored.

D. SITE PAVEMENTS

Based on the information available to date, it is assumed that minor regrading (i.e., net cuts/fills of 2 to 3 feet or less) will be required to achieve the finished pavement grades. Based on the sampling locations performed within the proposed pavement areas (i.e., TB-R1 through TB-R6, TB-B1, TB-B3, TB-B4, TB-B7, TB-B10 and TB-S13), the subsurface conditions generally consist of a surficial layer of topsoil overlying either predominately fine-grained soils (Stratum B) or granular soils (Stratum C). Where encountered, the fine-grained soils (Stratum B) were relatively shallow, ranging in depth from approximately 2 to 4 feet below the existing ground surface.

The fine-grained soils correspond to the American Association of State Highway and Transportation Officials (AASHTO) classifications A-4 and A-5. A-4 and A-5 soils are classified as “fair to poor” subgrade soils and typically require a deeper paving section to provide drainage and reduce frost susceptibility than predominantly granular subgrade soils. The coarse-grained soils correspond to AASHTO classification A-2. A-2 soils are classified as “excellent to good” subgrade soils.

The fine-grained soils of Stratum B would be considered as “fair to poor” subgrade soils in the classification system described above. However, the underlying granular soils encountered across the site meet the “excellent to good” subgrade soil criteria. Depending on the final pavement grading, pavement subgrade elevations may be below the relatively shallow depth of the “fair to poor” subgrade soils of Stratum B, and could likely be designed assuming “excellent to good” subgrade conditions. The final proposed grading should be reviewed with the subgrade conditions described herein to determine proper pavement design parameters. Further recommendations regarding pavement design are included in the conclusions and recommendations section of this report.

E. INFILTRATION TESTING

The table below summarizes the infiltration and geotechnical laboratory testing results for the soils at the approximate depth of infiltration testing.

Infiltration Test Location	Elevation of Test (Ft., Project Datum)	Depth Below Grade (Ft.)	USDA Description	USCS Description	Average Field Infiltration Rate (In/Hr)
I-2	43.5±	1.5±	Silty Loam	Silt	0.04
I-3	43.5±	3.5±	Sandy Loam	Silty Sand	0.27
I-4	45.2±	4.5±	Sandy Loam	Silty Sand	1.84
I-5	48.8±	4.0±	Sandy Loam	Silty Sand	2.62

Several soil series are identified by the Kent County Soil Survey within the area of the project site. These soil series include the Fallsington, Sassafras and Woodstown Soil Series. The Kent County Soil Survey provides estimated “permeability” rates of 2.0 to 6.3, 0.63 to 6.3 and 0.63 to 2.0 inches/hour for the aforementioned shallow site soils respectively. The test results for I-2 and I-3 were well below the anticipated infiltration range referenced within the Kent County Soil Survey.

In general, with the exception of the biofiltration swales proposed within the locations of I-4 and I-5, Duffield Associates generally does not recommend the utilization of infiltration practices at this site due the generally shallow groundwater conditions observed, elevations of seasonal high water indications, and observed infiltration testing results.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the data obtained in the field and laboratory testing programs and the subsequent geotechnical analysis, the following conclusions and recommendations are presented.

A. DESIGN

1. **Allowable Foundation Bearing Capacity.** It is Duffield Associates' opinion that the predominately loose to medium dense apparent "natural" silty sand soil of Stratum C, generally observed beneath Strata A and B (i.e., topsoil and silt or clay soils), is generally considered suitable for supporting the proposed structures on shallow foundation systems. Structural fill, placed over suitable soils, compacted and reviewed, as recommended in this report, is also considered suitable for supporting shallow foundations. It is recommended that the proposed foundations for all structures be designed for a maximum net allowable bearing pressure of 2,500 psf.
2. **Estimated Foundation Settlement.** Settlement of the site soils will result from the proposed site grading and loads. Total foundation settlement is estimated to be on the order of 1 inch for the field house and stands and 1½ inches for the high school. Due to the presence of predominately granular soils beneath the proposed foundations, most of the estimated settlement should occur relatively quickly following the application of loads. Post-construction settlement is estimated to be ½ inch or less, with differential settlements between typical column or wall spacing within the footprint of the structures estimated to be ½ inch or less. These magnitudes of total and differential settlement are generally considered to be within tolerable limits for the types of structures proposed. However, the actual settlement tolerances of the structures should be verified with the project's structural engineer. If actual loading and/or grading conditions vary significantly from the assumptions of this analysis, Duffield Associates should be contacted to review and possibly modify this analysis.
3. **Foundation Burial Depth and Size.** The base of all exterior spread footings in areas exposed to frost should be placed at least 24 inches below final exterior grade. Interior foundations in insulated areas should be placed at least 18 inches below the proposed finished floor elevation. All isolated column footings should be at least 3 feet wide, and all continuous wall footings should be at least 2 feet wide regardless of bearing pressure. Some undercut excavation of the Stratum B silt or clay soils may be required to bear the building foundations on suitable soils. If a winter construction schedule is proposed for the foundations, provisions for the protection of shallow foundations from frost heave during construction should be included in the contract specifications.

4. **Slab-On-Grade.** Ground-supported floor slabs for the proposed structures should be designed as fully floating and not connected to the other structural elements of the building. It is anticipated that the slab-on-grade will be constructed over suitable Stratum B silts or clay, Stratum C sand, or structural fill soil. The foundation-slab interface and partition wall-slab interface should also be designed to allow relative movement. Control joints should be utilized, within the slab, to control the location of possible cracking due to differential slab settlement. Slabs should be provided with a minimum 4-inch drainage layer (AASHTO SP No. 57 stone) and minimum 10-mil polyethylene vapor barrier. Subgrade conditions should be modeled for design utilizing a subgrade modulus; K_S , of 150 pci, assuming subgrade preparation is performed, as discussed herein.

5. **Retaining Walls.** Backfill pressures on “unyielding” retaining walls restrained from rotation at the top be analyzed using the “at rest” earth pressure coefficient, K_O . The “active” and “passive” earth pressure coefficients, K_A and K_P , respectively, should be utilized for the design of “yielding” retaining walls such as cantilevered walls. Retaining walls should typically be provided with free draining backfill materials and a drainage system or weep holes to relieve hydrostatic pressures on the walls. The free draining backfill materials should extend behind the wall with its top at least as wide as 60% of the wall height.

Based on the conditions encountered in this evaluation, it is anticipated that on-site fill materials will consist primarily of the fine-grained soils of Stratum B and the granular soils of Stratum C. The predominately fine-grained soils of Stratum B should not be utilized for wall backfill. Should sufficient quantities of the granular soils of Stratum C not be available, off-site granular borrow could also be utilized for wall backfill. Recommended lateral earth pressure parameters for design are presented below.

Backfill Materials	K_A	K_P	K_O	Coeff. of Sliding Friction	Moist Unit Weight (pcf)
Stratum C soils	0.35	2.9	0.52	0.37	125
Imported Granular Fill (with less than 25% passing a No. 200 sieve)	0.28	3.5	0.44	0.45	130

6. **Control Joints.** Masonry walls should be provided with frequent control joints placed at architecturally convenient locations, such as windows and doorways, to provide a “preferred” location for the differential settlement to occur without cracking the walls.

7. **Seismic Design Parameters.** Based on subsurface conditions encountered during the field exploration at the site and review of regional geologic maps, a Site Class “E,” as defined by Table 1613.5.2 of the 2006 International Building Code, is recommended.
8. **Infiltration Test Results.** A total of four (4) field infiltration tests were performed in the vicinity of the proposed stormwater management areas. The infiltration tests were performed at depths ranging from approximately 1.5 to 4.5 feet below the existing ground surface. The tests were performed at the elevations recommended or determined based on the subsurface conditions exposed during excavation. With the exception of the biofiltration swales proposed within the locations of I-4 and I-5, Duffield Associates generally does not recommend the utilization of infiltration practices at this site due the generally shallow groundwater conditions observed, elevations of seasonal high water indications, and observed infiltration testing results.
9. **Site Grading.** Site grading should be designed to provide positive drainage away from the locations of the proposed structures. Positive site drainage should be maintained throughout construction activities.
10. **Pavement Design.** Based on the assumed site grading, it appears that the pavement subgrades will primarily consist of the predominantly sandy soils of Stratum C.

Traffic loading consisting primarily of passenger vehicles in the proposed parking areas (with limited access to trash collection vehicles and other truck traffic) is anticipated. Additional recommendations are included for areas where limited truck or bus traffic is proposed.

Based on the conditions encountered in this evaluation and assuming subgrade preparation as discussed herein, the following minimum pavement sections for parking lots and driveways are recommended:

Location	Bituminous Concrete Wearing Course, Type C (inches)	Bituminous Concrete Binder Course, Type B (inches)	Graded Aggregate Base Course, Type A (inches)	Total Thickness (inches)
Parking Areas	2	2	8 ^[1]	12
Traffic lanes, dumpster areas and bus areas	2	3	12 ^[1]	17
<p>NOTES:</p> <ol style="list-style-type: none"> 1. The installation of a 6 ounce, non-woven, Geotextile Fabric (Geotex 601 or equivalent) is recommended between the prepared subgrade and graded aggregated base course to reduce the potential for migration of the “natural” site soils into the pavement section. 2. All pavement construction and materials should conform to the Delaware Department of Transportation Standard Specifications for Roadway and Bridge Construction, dated August 2001 and as subsequently revised. 				

11. **Stormwater Management Areas.** The following recommendations are provided for the stormwater management areas:

- As discussed in the Infiltration Testing section of this report, with the exception of the biofiltration swales proposed within the locations of infiltration tests I-4 and I-5, Duffield Associates generally does not recommend the utilization of infiltration practices at this site, due the generally shallow groundwater conditions observed, elevations of seasonal high water indications, and observed infiltration testing results.
- Observations during the field testing program and the results of laboratory testing indicate that soils typically recommended by the U.S. Soil Conservation Service (SCS) Pond Code 378 for embankment fills and low permeability soil liner construction (USCS: CL, CH, SC, GC) are not likely present in sufficient quantities to facilitate pond construction. However, the fine-grained soils of Stratum B may be suitable for embankment pond construction. If additional laboratory testing confirms the presence of suitable soils the project team may want to consider further field investigation in order to estimate the available quantity of these soils. If suitable soils are determined to not be present at the site, all imported embankment fill should meet the material requirements as recommended in SCS Pond Code 378.
- Stormwater management areas, infiltration design and construction should be performed in accordance with the DNREC “Delaware Sediment &

Stormwater Regulations,” dated January 23, 1991, most recently revised October 11, 2006.

- Stormwater embankment ponds should be designed in accordance with the SCS Pond Code 378.
12. **Assumptions.** This evaluation has been based on the information provided regarding the proposed finish floor elevations, structures and loading conditions. Assumptions regarding the design loads for the proposed football stands should be verified by the project team prior to the completion of their design. If the proposed loading conditions vary from those utilized, Duffield Associates should be notified to possibly modify the recommendations provided herein, as required.

B. CONSTRUCTION

1. **Proofroll and Subgrade Preparation.** At the start of construction, the proposed building construction and pavement areas should be stripped of all topsoil. Variable topsoil depth should be anticipated due to the past usage of the area for agricultural purposes. Following rough grading and prior to footing excavation, placement of fill, or construction of the floor slabs, it is recommended that the exposed subgrade be proofrolled. The proofroll should be performed using a minimum 10-ton vibratory roller in the presence of a qualified soils technician working under the supervision of a geotechnical engineer. The purpose of the proofrolling is to densify the subgrade soils and identify yielding subgrade conditions. Yielding or otherwise unsuitable subgrade conditions encountered within the proposed building areas should be undercut to firm subgrade conditions and backfilled with compacted structural fill in accordance with the recommendations of this report. Scarification and recompaction could also be performed in lieu of undercutting. A qualified soils technician working under the supervision of a geotechnical engineer should confirm the consistency and texture of the exposed soils with the conditions encountered by this evaluation, as described herein.
2. **Foundation Subgrade Review.** All shallow foundations should be placed on firm, dry, non-frozen subgrade consisting of the natural site soils of Stratum C or structural fill. Foundation excavations should be reviewed by a qualified technician working under the supervision of a geotechnical engineer who is familiar with the recommendations of this report. (Note: It is anticipated that the silt or clay soils of Stratum B will be encountered during foundation excavation. Where encountered, these soils were generally observed directly beneath the surficial topsoil and should be excavated to the suitable bearing soils of Stratum C). Subgrade review should be performed prior to the placement of reinforcing steel or concrete and should verify the presence of these soils. If these conditions are not encountered at the proposed foundation

depth, additional excavation should be performed until they are uniformly encountered across the base of the foundation's excavation or, if acceptable to the project geotechnical engineer, the natural soils can be densified in place. Foundation undercut areas should be backfilled with structural fill as recommended herein.

3. **Re-use of On-Site Soils as Structural Fill.** On-site soils free of organic material, topsoil, miscellaneous fill, debris and rock fragments in excess of 3 inches in their largest dimension may be suitable as structural fill. The shallow site soils consist primarily of the fine-grained soils (silt or clay) of Stratum B and the granular soils of Stratum C. The Stratum C soil may be suitable for re-use as structural fill. While it is possible that fine-grained soils could be utilized as structural fill or foundation backfill, some of these soils were encountered with an in-situ moisture content that exceeds the typical range that would allow the recommended compaction to be achieved. As a result, drying of these soils may be required to achieve the recommended compaction. Drying fine-grained soils requires an area in which to spread them out, extended periods of warm, dry weather, and time.

If sufficient quantities of suitable on-site soils are not available for structural fill, imported borrow consisting of predominately granular soils conforming to the requirements of the Delaware Department of Transportation Standard Specifications Select Borrow, Type G should be utilized. AASHTO SP-57 stone could also be utilized as structural fill and should be considered for localized, relatively deep fills such as within the agricultural ditch, foundation undercuts or wall backfill if applicable.

4. **Compaction Requirements.** Structural fill utilized within the proposed building areas should be placed in loose lifts with a maximum thickness of 8 inches. Each lift of fill placed within the proposed building areas (defined as the area extending at least 5 feet beyond the building perimeter) should be compacted to at least 95% of the maximum dry density, as determined by the Modified Proctor test (ASTM D 1557). Structural fill for utility trenches, wall backfill and pavement areas, located outside of the proposed building should be compacted to at least 90% of the maximum dry density. The placement and compaction of structural fill should be monitored on a full-time basis by a qualified technician under the supervision of a geotechnical engineer.
5. **Groundwater Control.** Groundwater was observed at a range of depths between approximately 3.5 to 11.5 feet below the existing ground surface, corresponding to elevations ranging from approximately 46.3 to 39 feet (project datum). Due to seasonal fluctuations in precipitation, higher groundwater elevations than those encountered are possible. Based on the subsurface conditions encountered, it is anticipated that groundwater conditions will be at or slightly below the depth of typical shallow foundation

excavation. Groundwater is also anticipated to be encountered within and adjacent to the existing agricultural ditch. Further, due to the observed fine-grained shallow site soils of Stratum B, it is considered possible that localized perched groundwater may be encountered at relatively shallow depths within footing or utility excavations. If groundwater is encountered, localized sumping may be required. Wherever significant quantities of groundwater are encountered during foundation and utility trench excavations, it may become necessary for the resulting excavation to be over excavated by several inches and backfilled with AASHTO SP-57 stone to facilitate sumping and protect the exposed subgrade during construction. Deeper well points should also be considered for deeper excavation, utility construction, etc. Groundwater collected during construction should be discharged in accordance with local regulatory requirements. Additionally, if lowering of the groundwater table is performed during construction, the effects on nearby structures should also be monitored.

6. **Protection of Subgrade Soils.** Subgrade soils disturbed by precipitation and construction traffic should be either scarified and recompacted, or undercut and replaced with structural fill as previously discussed. Subgrade disturbance could be reduced by maintaining positive surface drainage, by establishing and maintaining a sump throughout the construction period, and by limiting construction traffic on the exposed subgrade soils. Where construction traffic is required over the subgrade soils, construction of a temporary haul road, consisting of at least 8 inches of crushed stone (Type B aggregate) over a geotextile fabric (e.g., Geotex 315 or equivalent) should be considered. A thicker stone section will likely be required for prolonged heavy use by trucks. Additional stone can be added later as needed.
7. **Excavation Safety.** All utility and foundation excavation should be performed in accordance with OSHA guidelines. Typically, the predominately granular soils can be characterized by OSHA CFR Part 1926 Excavation Standards as Type C soils. Should it be required, all temporary sheeting and shoring should be designed by a qualified engineer registered in the State of Delaware.
8. **Subsurface Data.** All contractors interested in bidding on phases of this work which involve subsurface conditions should be given full access to this report so that they can develop their own interpretations of the available data.

These recommendations have been prepared according to generally accepted soil and foundation engineering standards and are based on the conditions encountered by the sampling performed at the site. It is noted that, although soil quality has been inferred from the interpolation of the sampling data, subsurface conditions beyond the sampling points are, in fact, unknown. As a result, these recommendations may require modifications based on the conditions encountered and exposed during construction excavation. Should any conditions encountered during construction differ from those described in this report, this office should be notified immediately in order to review and

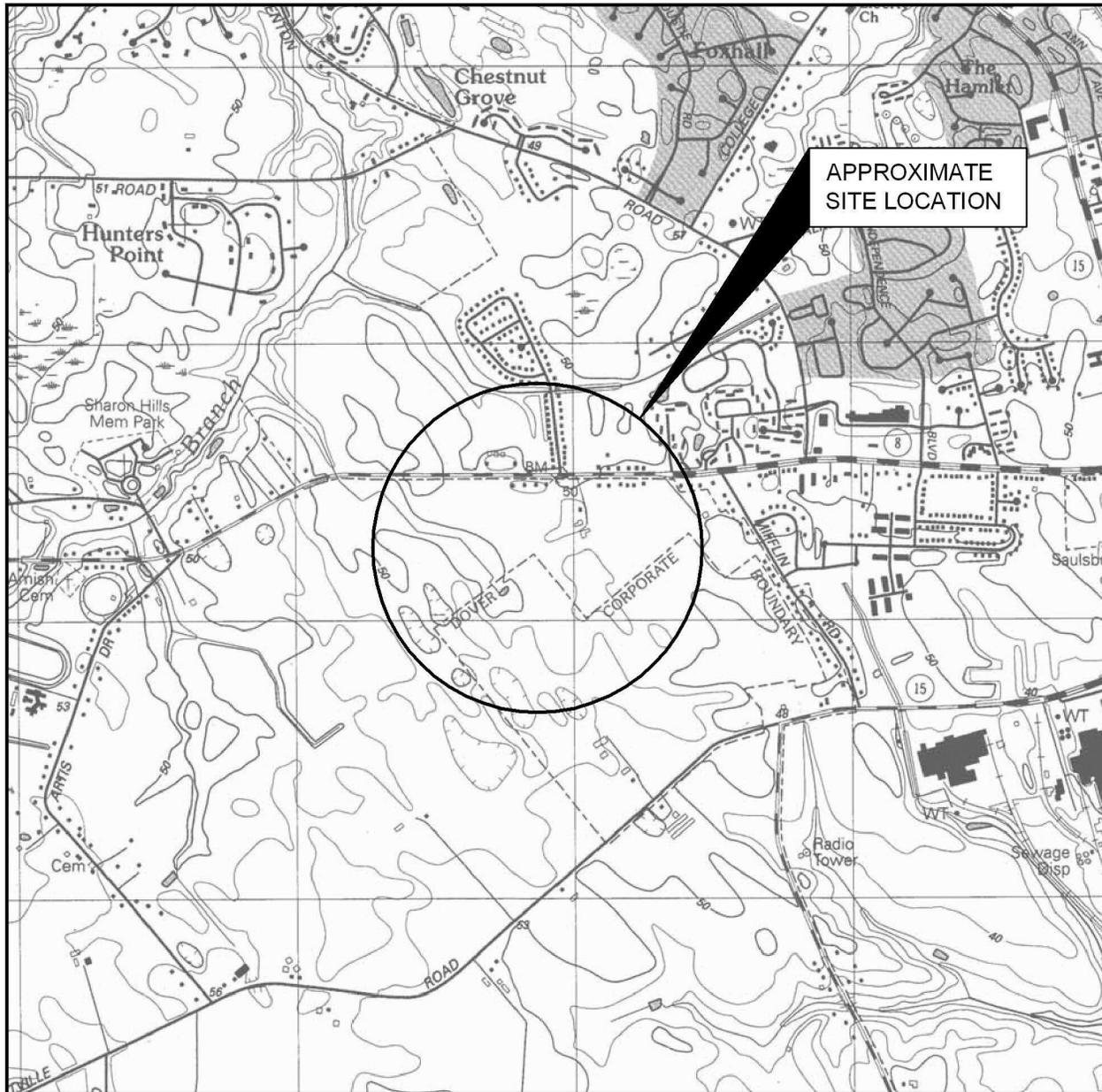
possibly modify these recommendations. The cost for this construction review is not part of the existing agreement. This report applies solely to the size, type and location of the structures described herein. In the event that changes are proposed, this report will not be considered valid unless the changes have been reviewed and the recommendations of this report modified and reapproved in writing by Duffield Associates, Inc.

WORD\7158GC.1210-DOVER HIGH SCHOOL.RPT

APPENDIX A

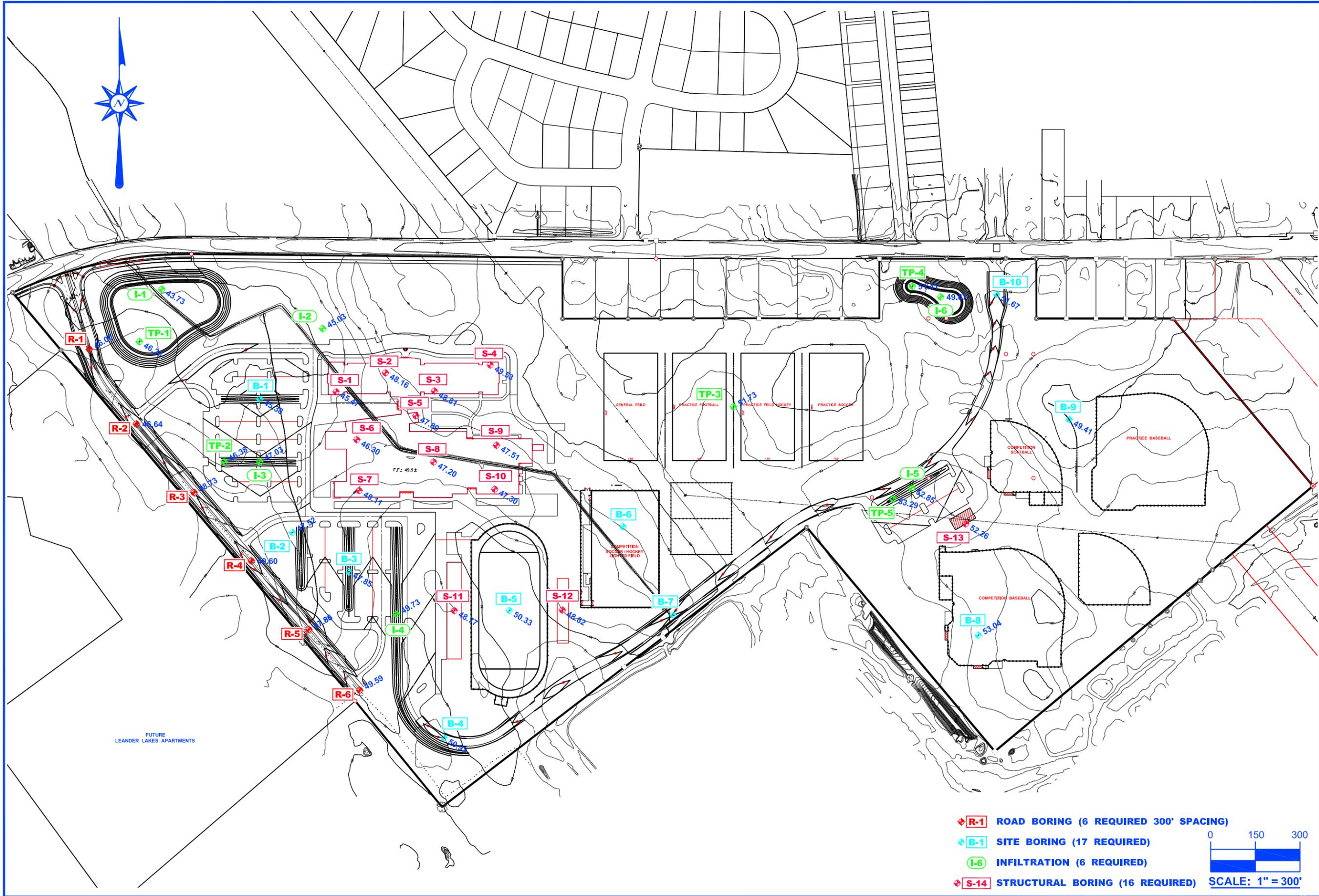
SITE LOCATION SKETCH

SAMPLING LOCATION SKETCH



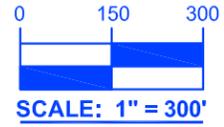
NOTE:
 THIS LOCATION SKETCH IS ADAPTED FROM THE U.S.G.S. TOPOGRAPHIC MAP,
 7.5 MINUTE SERIES, FOR DOVER, DELAWARE 1993.

DATE: 3 NOVEMBER 2010	<p style="text-align: center;">SITE LOCATION SKETCH</p> <p style="text-align: center;">CAPITAL SCHOOL DISTRICT - DOVER HIGH SCHOOL GEOTECHNICAL EVALUATION</p> <p style="text-align: center;">DOVER ~ KENT COUNTY ~ DELAWARE</p>	DESIGNED BY: KMY	 DUFFIELD ASSOCIATES <i>Consultants in the Geosciences</i> 5400 LIMESTONE ROAD WILMINGTON, DE 19808-1232 TEL. (302)239-6634 FAX (302)239-8485 OFFICES IN DELAWARE, MARYLAND PENNSYLVANIA AND NEW JERSEY E-MAIL: DUFFIELD@DUFFNET.COM
SCALE: 1"=2000'		DRAWN BY: EMP	
PROJECT NO. 7158.GC		CHECKED BY: KMY	
SHEET: FIGURE 1		FILE: A-7518GC-01	



FUTURE
LEANDER LAKES APARTMENTS

- ◆ **R-1** ROAD BORING (6 REQUIRED 300' SPACING)
- **B-1** SITE BORING (17 REQUIRED)
- **I-6** INFILTRATION (6 REQUIRED)
- **S-14** STRUCTURAL BORING (16 REQUIRED)



BORING LOCATIONS - AS STAKED 2010-10-29
DOVER HIGH SCHOOL
CAPITAL SCHOOL DISTRICT

CITY OF DOVER
 KENT COUNTY, DELAWARE

**BECKER
 MORGAN
 GROUP**

ARCHITECTURE
 ENGINEERING
Dover
 309 S. Governors Ave.
 Dover, DE 19904
 Ph. 302.734.7950
 Fax 302.734.7965

BMG: 2010057
 SCALE: 1" = 300'
 DATE: 10/21/10
 DRAWN BY: M.A.R.

APPENDIX B

TEST BORING LOGS (29)

TEST PIT LOGS (11)

INFILTRATION TESTING PLOT (1)



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 18, 2010
 Date Completed : November 18, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 45.4 feet ± Project Datum
 Northing : 0
 Easting : 20

Depth in feet	Surf. Elev. 45.4 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0	45			TOPSOIL (± 12 inches)								
			SC	Dark gray, gray, orange, white fine SAND and CLAY, trace medium to coarse sand, trace gravel; LIQUID LIMIT = 17, PLASTICITY INDEX = 1		<input checked="" type="checkbox"/>	S-1	5-4-6	1.3	13.3	46.9	
			SM	Gray, light brown, orange-brown fine SAND, some to and silt (moist)		<input checked="" type="checkbox"/>	S-2A	3-2-2	1.1			<input checked="" type="checkbox"/>
5	40			Gray, light brown, white fine SAND, some silt, trace gravel, trace medium to coarse sand (moist)		<input checked="" type="checkbox"/>	S-2B					
				Varicolored (Brown, white, gray, red-brown) fine to medium SAND, little to some coarse sand, little gravel, trace silt (wet)		<input checked="" type="checkbox"/>	S-3	3-3-5	1.4			
				Orange-brown, dark gray, white fine to medium SAND, little to some coarse sand, little to trace gravel, trace silt (wet)		<input checked="" type="checkbox"/>	S-4	2-3-5	1.1			
10	35											
				Orange-brown, white, red-brown, orange-yellow fine to medium SAND, little gravel, trace coarse sand, trace silt (wet)		<input checked="" type="checkbox"/>	S-5	2-3-4	1.4			
15	30											
				Orange, red-orange, yellow fine to medium SAND, little silt, trace coarse sand, trace gravel (wet)		<input checked="" type="checkbox"/>	S-6	4-4-8	1.4			
20	25											
				Brown, orange-brown, black, red-brown, white fine to medium SAND, little to some coarse sand, little to trace gravel, trace silt (wet)		<input checked="" type="checkbox"/>	S-7	6-7-8	1.3			
25	20											

NOTES:

- Test boring terminated at ± 50.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 4.9 feet b.e.g.s.
- Water elevation at 4.2 feet b.e.g.s. with augers at 6.0 feet b.e.g.s. after obtaining sample S-3.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 50 feet b.e.g.s.
- Borehole dry and caved at 2.4 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 18, 2010
 Date Completed : November 18, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 45.4 feet ± Project Datum
 Northing : 0
 Easting : 20

Depth in feet	Surf. Elev. 45.4 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input type="checkbox"/> Remolded	<input type="checkbox"/> During Drilling							
30	15		SM	<input type="checkbox"/>		<input type="checkbox"/>	S-8	7-6-8	1.5			
35	10			Orange, yellow-gray, red-brown, white, gray fine to medium SAND, little to some coarse sand, little gravel, little silt (wet)	<input type="checkbox"/>		<input type="checkbox"/>	S-9	5-9-15	1.5		
40	5		ML	<input type="checkbox"/>		<input type="checkbox"/>	S-10	3-5-8	1.5			
45	0		SM	<input type="checkbox"/>		<input type="checkbox"/>	S-11	6-5-6	1.5	23.9	15.7	
50	-5			<input type="checkbox"/>		<input type="checkbox"/>	S-12	13-17-25	1.4			

NOTES:

- Test boring terminated at ± 50.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 4.9 feet b.e.g.s.
- Water elevation at 4.2 feet b.e.g.s. with augers at 6.0 feet b.e.g.s. after obtaining sample S-3.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 50 feet b.e.g.s.
- Borehole dry and caved at 2.4 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010
 Date Completed : November 19, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 48.2 feet ± Project Datum
 Northing : 0
 Easting : 0

Depth in feet	Surf. Elev. 48.2 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
0												
			ML			<input checked="" type="checkbox"/>	S-1	2-2-6	1.4			
45						<input checked="" type="checkbox"/>	S-2	7-9-12	1.3			
5						<input checked="" type="checkbox"/>	S-3	4-5-8	1.3			<input checked="" type="checkbox"/>
40						<input checked="" type="checkbox"/>	S-4	3-4-5	1.4			
10						<input checked="" type="checkbox"/>	S-5	2-1-3	1.5	29.0	16.6	
35			SM			<input checked="" type="checkbox"/>	S-6	2-2-3	1.3			
15						<input checked="" type="checkbox"/>	S-7	4-2-4	1.5			
30												
20												
25												
25												

NOTES:

- Test boring terminated at ± 30.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 6 feet b.e.g.s.
- Water elevation at 6.4 feet b.e.g.s. with augers at 6 feet b.e.g.s. after obtaining sample S-3.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 30 feet b.e.g.s.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010 Drilling Equipment : ATV Mounted Diedrich D-50
 Date Completed : November 19, 2010 Drilling Methods : HSA (SPT, ASTM D 1586)
 Logged by : ARS Surface Elevation : 48.2 feet ± Project Datum
 Weather : Partly cloudy, 40's °F Northing : 0
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc. Easting : 0

Depth in feet	Surf. Elev. 48.2 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
20			SM			<input checked="" type="checkbox"/>	S-8	6-10-11	1.5			
30												
15												
35												
10												
40												
5												
45												
0												
50												
-5												

NOTES:

1. Test boring terminated at ± 30.0 feet b.e.g.s. (below existing ground surface).
2. Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
3. Wet-on-spoon conditions observed at 6 feet b.e.g.s.
4. Water elevation at 6.4 feet b.e.g.s. with augers at 6 feet b.e.g.s. after obtaining sample S-3.
5. Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 30 feet b.e.g.s.
6. Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010
 Date Completed : November 19, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 48.8 feet ± Project Datum
 Northing : 0
 Easting : 30

Depth in feet	Surf. Elev. 48.8 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 9 inches)								
				Brown, orange-brown fine SAND, some silt (moist)	<input checked="" type="checkbox"/>	S-1	2-1-5	1.5				
45				Gray, orange fine SAND, some to and silt (moist)	<input checked="" type="checkbox"/>	S-2A	6-18-24	1.5				
5				Orange-brown, brown, red-brown, white fine SAND, little gravel, trace medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-2B						
				Orange, orange-brown fine SAND, little silt (moist)	<input checked="" type="checkbox"/>	S-3	5-7-7	1.5				
40				Orange, red-brown fine SAND, little silt, trace medium sand (wet)	<input checked="" type="checkbox"/>	S-4	2-3-3	1.5				<input checked="" type="checkbox"/>
10												
35			SM	Yellow-brown, red-brown, white fine to medium SAND, little to some coarse sand, little silt (wet)	<input checked="" type="checkbox"/>	S-5	2-3-6	1.5				
15												
30				Light yellow, light orange-brown, white fine to medium SAND, little coarse sand, trace silt (wet)	<input checked="" type="checkbox"/>	S-6	4-4-6	1.5				
20												
25				Orange, yellow-orange fine to medium SAND, little coarse sand, trace silt (wet)	<input checked="" type="checkbox"/>	S-7	4-4-4	1.5				
25												

NOTES:

- Test boring terminated at ± 30.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 7.9 feet b.e.g.s.
- Water elevation at 7.7 feet b.e.g.s. with augers at 8.5 feet b.e.g.s.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 30 feet b.e.g.s.
- Borehole caved at approximately 8.2 feet b.e.g.s. with water level at 4.5 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010 Drilling Equipment : ATV Mounted Diedrich D-50
 Date Completed : November 19, 2010 Drilling Methods : HSA (SPT, ASTM D 1586)
 Logged by : ARS Surface Elevation : 48.8 feet ± Project Datum
 Weather : Partly cloudy, 40's °F Northing : 0
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc. Casting : 30

Depth in feet	Surf. Elev. 48.8 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
20			SM			<input checked="" type="checkbox"/>	S-8	7-8-16	1.3			
30												
15												
35												
10												
40												
5												
45												
0												
50												
-5												

NOTES:

- Test boring terminated at ± 30.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 7.9 feet b.e.g.s.
- Water elevation at 7.7 feet b.e.g.s. with augers at 8.5 feet b.e.g.s.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 30 feet b.e.g.s.
- Borehole caved at approximately 8.2 feet b.e.g.s. with water level at 4.5 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
Dover High School
Dover, DE
Project No. 7158.GC

Date Started : November 15, 2010
Date Completed : November 15, 2010
Logged by : ARS
Weather : Overcast, 50's °F
Driller/Agency : Dana/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
Drilling Methods : HSA (SPT, ASTM D 1586)
Surface Elevation : 49.5 feet ± Project Datum
Northing : 0
Easting : 10

Depth in feet	Surf. Elev. 49.5 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 12 inches)								
			SM	Orange-brown, dark brown fine SAND, little to trace medium sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-1	1-4-10	1.0				
			ML	Orange-brown, dark brown fine SAND, little to trace medium sand, trace gravel, trace silt (moist) Gray, orange SILT, little fine sand, trace medium to coarse sand (moist)	<input checked="" type="checkbox"/>	S-2A S-2B	10-4-2	1.5				
			SM	Varicolored (yellow-gray, gray, orange, black) fine SAND, little to some silt, trace medium to coarse sand, trace fine gravel (moist to wet)	<input checked="" type="checkbox"/>	S-3	4-4-3	1.5				
			SM	Orange, yellow, red-brown fine to medium SAND, little silt, trace coarse sand (wet)	<input checked="" type="checkbox"/>	S-4	2-3-5	1.5				<input checked="" type="checkbox"/>
			SM	Yellow, white fine to medium SAND, little silt (wet)	<input checked="" type="checkbox"/>	S-5	1/12"-2	1.5				
			SM	Gray, white, gray-yellow fine to medium SAND, little silt, little coarse sand, trace fine gravel (wet)	<input checked="" type="checkbox"/>	S-6	2-2-4	1.5				
			SM	Varicolored (gray, orange, yellow-brown, white) fine to medium SAND, little silt, trace coarse sand (wet)	<input checked="" type="checkbox"/>	S-7	2-3-5	1.5				

NOTES:

- Test boring terminated at ± 25.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 8.2 feet b.e.g.s.
- Water elevation at 8.1 feet b.e.g.s. with augers at 8.5 feet b.e.g.s.
- Borehole caved at 8.6 feet b.e.g.s. with water level at 6.4 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010
 Date Completed : November 19, 2010
 Logged by : ARS
 Weather : Clear, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 47.8 feet ± Project Datum
 Northing : 0
 Easting : 40

Depth in feet	Surf. Elev. 47.8 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 13 inches)								
			ML	Gray, orange SILT and fine SAND, trace gravel (moist)	<input checked="" type="checkbox"/>	S-1A						
				Gray, orange, red-brown fine SAND, little gravel, little medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-1B	2-3-9		1.4			
45				Brown, gray, orange, dark brown fine SAND, little silt, trace medium to coarse sand, trace gravel (moist)	<input checked="" type="checkbox"/>	S-2	13-9-9		1.5			
5				Orange, red-orange, yellow, gray, brown fine SAND, some silt, trace medium sand (moist)	<input checked="" type="checkbox"/>	S-3	4-5-5		1.3	19.2	24.6	<input checked="" type="checkbox"/>
40				Orange, red-gray fine SAND, little silt, trace gravel, trace medium to coarse sand (wet)	<input checked="" type="checkbox"/>	S-4	2-4-3		1.4			
10												
35			SM	Yellow, white, orange-yellow fine SAND, little to some medium to coarse sand, little silt (wet)	<input checked="" type="checkbox"/>	S-5	2-1-1		1.5	27.3	16.0	
15												
30				Orange, yellow-orange, white, gray fine to medium SAND, little to some coarse sand, little to trace gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-6	5-4-5		1.1			
20												
25				Orange, yellow-gray, red-brown, brown fine SAND, little to some medium to coarse sand, trace to little silt (wet)	<input checked="" type="checkbox"/>	S-7	3-4-6		1.5			
25												

NOTES:

- Test boring terminated at ± 25.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 8.2 feet b.e.g.s.
- Water elevation at 7.2 feet b.e.g.s. with augers at 8.5 feet b.e.g.s.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 25 feet b.e.g.s.
- Borehole caved at 3.8 feet b.e.g.s. with water level at 3.8 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 17, 2010
 Date Completed : November 17, 2010
 Logged by : ARS
 Weather : Clear, Windy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 46.3 feet ± Project Datum
 Northing : 0
 Easting : 50

Depth in feet	Surf. Elev. 46.3 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
0												
45			CL			<input checked="" type="checkbox"/>	S-1A S-1B	2-4-9	1.3			
						<input checked="" type="checkbox"/>	S-2	5-9-6	1.1			▼
40						<input checked="" type="checkbox"/>	S-3	1-2-1	1.3	24.1	13.7	
						<input checked="" type="checkbox"/>	S-4	5-5-5	1.4			
35			SM			<input checked="" type="checkbox"/>	S-5	4-4-3	1.4			
30						<input checked="" type="checkbox"/>	S-6	2-4-4	1.5			
25						<input checked="" type="checkbox"/>	S-7	5-6-9	1.5			
20												

NOTES:

- Test boring terminated at ± 25.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 5.0 feet b.e.g.s.
- Water elevation at 4.6 feet b.e.g.s. with augers at 6.0 feet b.e.g.s.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 25 feet b.e.g.s.
- Borehole dry and caved at 2.9 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 15, 2010
 Date Completed : November 15, 2010
 Logged by : ARS
 Weather : Overcast, 50's °F
 Driller/Agency : Dana/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 48.1 feet ± Project Datum
 Northing : 0
 Easting : 80

Depth in feet	Surf. Elev. 48.1 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 14 inches)								
				Brown, gray, orange fine SAND, little to some silt, trace gravel (moist)	<input checked="" type="checkbox"/>	S-1	2-4-7	1.3				
45				Brown, gray, orange, red-orange fine SAND, little to some silt, little to trace medium to coarse sand, trace gravel (moist)	<input checked="" type="checkbox"/>	S-2	7-4-9	1.5				
5				Varicolored (red-brown, orange, yellow, black) fine to medium SAND, little silt, trace fine gravel (wet)	<input checked="" type="checkbox"/>	S-3	4-5-4	1.5				<input checked="" type="checkbox"/>
40				Varicolored (yellow-orange, red-brown, dark gray) fine to medium SAND, little silt, trace coarse sand to fine gravel (wet)	<input checked="" type="checkbox"/>	S-4	1-3-4	1.5				
10												
35			SM	Orange-brown fine to medium SAND, little silt, little coarse sand to fine gravel (wet)	<input checked="" type="checkbox"/>	S-5	1-2-1	1.5				
15												
30				Orange-brown fine to medium SAND, some coarse sand, little to trace gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-6	2-5-8	1.5				
20												
25				Orange-brown, red-brown fine to medium SAND, little coarse sand, trace gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-7	6-6-12	1.5				
25												

NOTES:

- Test boring terminated at ± 25.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 4 feet b.e.g.s.
- Water elevation at 6.6 feet b.e.g.s. with augers at 6.0 feet b.e.g.s. after obtaining sample S-3.
- Approximately 4 inches of heave in borehole before obtaining sample S-6.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 17, 2010
 Date Completed : November 17, 2010
 Logged by : ARS
 Weather : Clear, Windy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 47.2 feet ± Project Datum
 Northing : 0
 Easting : 70

Depth in feet	Surf. Elev. 47.2 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 12 inches)								
			CL	Dark gray, orange CLAY, little silt, some fine sand, trace organics (e.g., root material) (moist)	<input checked="" type="checkbox"/>	S-1A						
45				Gray, dark gray, orange fine SAND, little silt, trace to little coarse sand, trace gravel (moist)	<input checked="" type="checkbox"/>	S-1B	1-6-10	1.3				
				Orange-brown, yellow-orange, brown, light gray fine SAND, trace silt (moist)	<input checked="" type="checkbox"/>	S-2	5-5-5	1.3				
5												<input checked="" type="checkbox"/>
				Red-orange, orange fine to medium SAND, trace silt (wet)	<input checked="" type="checkbox"/>	S-3	4-5-3	1.4				
40				Orange-brown, orange, yellow-orange, brown fine SAND, little medium to coarse sand, little silt, trace gravel (wet)	<input checked="" type="checkbox"/>	S-4	2-3-5	1.5	22.7	12.5		
10												
			SM	Orange-brown, orange, yellow-orange, brown fine SAND, little medium to coarse sand, trace gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-5	3-3-4	1.5				
35												
				Yellow-brown, orange-brown, red-orange, red-brown fine to medium SAND, little to some silt, little coarse sand, trace gravel (wet)	<input checked="" type="checkbox"/>	S-6	2-2-4	1.5				
15												
30				Orange, yellow-orange, white, red-brown fine SAND, some medium to coarse sand, little silt, trace gravel (wet)	<input checked="" type="checkbox"/>	S-7	3-3-5	1.5				
20												
25												
25												

NOTES:

- Test boring terminated at ± 25.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 5.3 feet b.e.g.s.
- Water elevation at 5.5 feet b.e.g.s. with augers at 6.0 feet b.e.g.s.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 25 feet b.e.g.s.
- Borehole caved at 3.3 feet b.e.g.s. with water level at approximately 2.9 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 18, 2010
 Date Completed : November 18, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 47.5 feet ± Project Datum
 Northing : 0
 Easting : 60

Depth in feet	Surf. Elev. 47.5 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 14 inches)								
			CL	Gray, orange CLAY, some fine sand, little silt (moist)	<input checked="" type="checkbox"/>	S-1A		2-2-7	1.5			
45				Gray, white fine SAND, little silt, trace medium to coarse sand (moist)	<input checked="" type="checkbox"/>	S-1B						
				Light gray, gray, orange-brown, gray-brown, white fine SAND, some medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-2		12-21-26	1.4			
5												
				Orange, yellow-orange, gray, gray-brown fine SAND, little silt, little medium sand (moist to wet)	<input checked="" type="checkbox"/>	S-3		5-5-4	1.5			<input checked="" type="checkbox"/>
40												
				Orange, gray-brown fine SAND, little to some silt, little to trace medium sand (wet)	<input checked="" type="checkbox"/>	S-4		3-2-4	1.5			
10												
			SM	Orange, yellow-orange, red-brown, black fine SAND, little silt, trace to little medium to coarse sand, trace gravel (wet)	<input checked="" type="checkbox"/>	S-5		1-1-2	1.5	27.3	17.7	
35												
				Orange-brown, yellow-orange, red-brown, green-gray fine to medium SAND, trace to little coarse sand, trace gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-6		3-5-5	1.3			
30												
				Orange, white, red-brown, dark gray fine to medium SAND, little to some coarse sand, little gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-7		3-4-6	1.4			
25												
25												

NOTES:

- Test boring terminated at ± 50.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 6.0 feet b.e.g.s.
- Water elevation at 6.7 feet b.e.g.s. with augers at 6.0 feet b.e.g.s. after obtaining sample S-3.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 50 feet b.e.g.s.
- Borehole caved at 3.1 feet b.e.g.s. with water level at approximately 2.5 feet b.e.g.s. upon removal of augers.

7. Bor



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 18, 2010
 Date Completed : November 18, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 47.5 feet ± Project Datum
 Northing : 0
 Easting : 60

Depth in feet	Surf. Elev. 47.5 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL	
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling								DESCRIPTION
20			SM			<input checked="" type="checkbox"/>	S-8	4-3-6	1.4				
30							<input checked="" type="checkbox"/>	S-9	5-22-42	1.3			
15			ML			<input checked="" type="checkbox"/>	S-10	4-5-6	1.5	44.0	97.0		
35							<input checked="" type="checkbox"/>	S-11	3-2-6	1.5			
40							<input checked="" type="checkbox"/>	S-12	4-6-9	1.5			
5			SM			<input checked="" type="checkbox"/>							
45							<input checked="" type="checkbox"/>						
50													
-5													

NOTES:

- Test boring terminated at ± 50.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 6.0 feet b.e.g.s.
- Water elevation at 6.7 feet b.e.g.s. with augers at 6.0 feet b.e.g.s. after obtaining sample S-3.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 50 feet b.e.g.s.
- Borehole caved at 3.1 feet b.e.g.s. with water level at approximately 2.5 feet b.e.g.s. upon removal of augers.
- Borehole caved at 3.1 feet b.e.g.s. with water level at approximately 2.5 feet b.e.g.s. upon removal of augers.



Capital School District
Dover High School
Dover, DE
Project No. 7158.GC

Date Started : November 15, 2010
Date Completed : November 15, 2010
Logged by : ARS
Weather : Overcast, 50's °F
Driller/Agency : Dana/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
Drilling Methods : HSA (SPT, ASTM D 1586)
Surface Elevation : 47.3 feet ± Project Datum
Northing : 0
Easting : 90

Depth in feet	Surf. Elev. 47.3 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 12 inches)								
			CL	Dark gray, orange silty CLAY, little fine sand (dry)	<input checked="" type="checkbox"/>	S-1A						
45				Light gray, dark gray fine SAND, trace to little medium to coarse sand, little silt, trace gravel (dry)	<input checked="" type="checkbox"/>	S-1B	2-7-14	1.3				
				White-gray, gray, orange fine SAND, little to some silt, trace medium to coarse sand, trace gravel (moist)	<input checked="" type="checkbox"/>	S-2	4-3-2	1.3				
5				Varicolored (yellow, orange-yellow, red-brown, yellow-gray) fine to medium SAND, trace silt, trace coarse sand to fine gravel (wet)	<input checked="" type="checkbox"/>	S-3	2-1-1	1.4				<input checked="" type="checkbox"/>
40				Orange, orange-brown fine to medium SAND, little to some silt, little to trace coarse sand (wet)	<input checked="" type="checkbox"/>	S-4	1-1-2	1.5				
10												
35			SM	Orange fine to medium SAND, little silt, little to trace coarse sand to fine gravel (wet)	<input checked="" type="checkbox"/>	S-5	1-2-3	1.5				
15												
30				Yellow-orange, red-orange fine to medium SAND, little to some silt (wet)	<input checked="" type="checkbox"/>	S-6	1-2-6	1.5				
20												
25				Orange, dark orange, orange-yellow fine to medium SAND, little silt (wet)	<input checked="" type="checkbox"/>	S-7	3-6-10	1.5				
25												

NOTES:

- Test boring terminated at ± 25.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 7 feet b.e.g.s.
- Water elevation at 6.9 feet b.e.g.s. with augers at 8.5 feet b.e.g.s.
- Borehole caved at 8.1 feet b.e.g.s. with water level at 6.8 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 15, 2010
 Date Completed : November 15, 2010
 Logged by : ARS
 Weather : Overcast, 50's °F
 Driller/Agency : Dana/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 46 feet ± Project Datum

Depth in feet	Surf. Elev. 46 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 12 inches)								
45				Brown, orange-brown, gray-brown fine SAND, little to some medium to coarse sand, little silt, trace fine gravel (moist)	<input checked="" type="checkbox"/>	S-1	2-4-5	1.3				
				Varicolored (gray, orange, red-brown) fine SAND, little medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-2	3-2-1	1.3				
5			SM	Orange-brown, red-brown, black fine SAND, little medium sand, trace coarse sand, trace silt, trace gravel (wet)	<input checked="" type="checkbox"/>	S-3	3-3-5	1.5				▼
40				Brown, orange-brown, red-brown, black fine to medium SAND, little to trace coarse sand to fine gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-4	5-5-5	1.5				
10												
35												
15												
30												
20												
25												
25												
20												

NOTES:

- Test boring terminated at ± 10.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 5.2 feet b.e.g.s.
- Water elevation at 5.7 feet b.e.g.s. with augers at 6.0 feet b.e.g.s.
- Borehole caved at 5.2 feet b.e.g.s. with water level at 4.8 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010
 Date Completed : November 19, 2010
 Logged by : ARS
 Weather : Clear, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 46.6 feet ± Project Datum

Depth in feet	Surf. Elev. 46.6 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded								
DESCRIPTION												
0				TOPSOIL (± 9 inches)								
45			SM	Orange-brown fine SAND, little silt (moist)	<input checked="" type="checkbox"/>	S-1	2-5-9	0.2				
5				Orange-brown, gray, red-brown fine SAND, little medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-2	4-6-6	1.4				
40												
10												
35												
15												
30												
20												
25												
25												
20												

NOTES:

- Test boring terminated at ± 5.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- No groundwater encountered during drilling.

- Borehole dry and caved at 2.7 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 15, 2010
 Date Completed : November 15, 2010
 Logged by : ARS
 Weather : Overcast, 50's °F
 Driller/Agency : Dana/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 48.7 feet ± Project Datum

Depth in feet	Surf. Elev. 48.7 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 12 inches)								
45			SM	Brown, orange-brown fine SAND, little silt, little medium to coarse sand, trace gravel (moist)	<input checked="" type="checkbox"/>	S-1	2-3-6	1.3				
5			SM	Brown, orange-brown, black, white fine to medium SAND, little silt, little coarse sand, trace gravel (moist)	<input checked="" type="checkbox"/>	S-2	7-8-9	1.4				
40			SM	Orange-brown, yellow-gray, white fine to medium SAND, little silt, trace coarse sand, trace gravel (wet)	<input checked="" type="checkbox"/>	S-3	5-6-7	1.3				<input checked="" type="checkbox"/>
10			SM	Varicolored (orange-brown, yellow, black, gray) fine to medium SAND, little to some coarse sand, little silt, trace gravel (wet)	<input checked="" type="checkbox"/>	S-4	3-3-4	1.3				

NOTES:

- Test boring terminated at ± 10.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 5.2 feet b.e.g.s.
- Water elevation at 6.4 feet b.e.g.s. with augers at 6.0 feet b.e.g.s. after obtaining sample S-3.
- Borehole caved at 6.6 feet b.e.g.s. with water level at 5.2 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010
 Date Completed : November 19, 2010
 Logged by : ARS
 Weather : Clear, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 49.6 feet ± Project Datum

Depth in feet	Surf. Elev. 49.6 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded								
DESCRIPTION												
0				TOPSOIL (± 12 inches)								
			SM	Orange-brown, white fine SAND and SILT, trace gravel (moist)	<input checked="" type="checkbox"/>	S-1	2-3-4	1.3	14.7	46.1		
45				Orange-brown, orange, red-orange, yellow-gray, dark brown fine SAND, trace silt, trace medium to coarse sand (moist)	<input checked="" type="checkbox"/>	S-2	6-5-9	1.5				
5												
10	40											
15	35											
20	30											
25	25											

NOTES:

1. Test boring terminated at ± 5.0 feet b.e.g.s. (below existing ground surface).
2. Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
3. No groundwater encountered during drilling.

4. Borehole dry and caved at 2.1 feet b.e.g.s. upon removal of augers.
5. Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 17, 2010
 Date Completed : November 17, 2010
 Logged by : ARS
 Weather : Clear, Windy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 47.9 feet ± Project Datum

Depth in feet	Surf. Elev. 47.9 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 13 inches)								
			ML	Gray, orange clayey SILT, little fine sand	<input checked="" type="checkbox"/>	S-1A						
				Gray, orange fine SAND, little to some gravel, trace medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-1B	3-3-10	1.2				
45			SM	Gray, orange-brown, red-brown fine SAND, little silt, trace gravel, trace medium to coarse sand (moist)	<input checked="" type="checkbox"/>	S-2	6-8-7	1.5				
5				Varicolored (Brown, gray, white, orange-brown) fine to medium SAND, little gravel, trace coarse sand, trace silt (moist to wet)	<input checked="" type="checkbox"/>	S-3	6-7-7	1.2				<input checked="" type="checkbox"/>
40				Varicolored (Brown, orange-brown, red-brown, white, yellow) fine to medium SAND, trace to little coarse sand, trace silt, trace gravel (wet)	<input checked="" type="checkbox"/>	S-4	3-5-5	1.3				
10												
35												
15												
30												
20												
25												
25												

NOTES:

- Test boring terminated at ± 10.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 6.9 feet b.e.g.s.
- Water elevation at 5.9 feet b.e.g.s. with augers at 8.5 feet b.e.g.s.
- Borehole wet and caved at 4.1 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010
 Date Completed : November 19, 2010
 Logged by : ARS
 Weather : Clear, 40°s
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 49.6 feet ± Project Datum

Depth in feet	Surf. Elev. 49.6 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded								
DESCRIPTION												
0				TOPSOIL (± 10 inches)								
				Orange-brown fine SAND, trace gravel, trace silt (moist)	<input checked="" type="checkbox"/>		S-1	6-12-12	1.1			
45			SM	Orange-brown, white fine SAND, some gravel, little medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>		S-2	6-10-8	1.2			
5												
10												
15												
20												
25												
30												
35												
40												

NOTES:

1. Test boring terminated at ± 5.0 feet b.e.g.s. (below existing ground surface).
2. Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
3. No groundwater encountered during drilling.

4. Borehole dry and caved at 1.5 feet b.e.g.s. upon removal of augers.
5. Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 22, 2010
 Date Completed : November 22, 2010
 Logged by : ARS
 Weather : Foggy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 45.4 feet ± Project Datum

Depth in feet	Surf. Elev. 45.4 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
0	45		SM	TOPSOIL (± 5 inches)		<input checked="" type="checkbox"/>	S-1A					
			ML	Gray, orange fine SAND, trace medium to coarse sand, trace silt, trace gravel (moist)		<input checked="" type="checkbox"/>	S-1B	2-3-3	1.1			
				Gray, orange SILT, little gravel, trace fine sand (moist)								
5	40			Light gray, gray, orange-brown, white fine SAND, some medium to coarse sand, little silt, trace gravel (moist to wet)		<input checked="" type="checkbox"/>	S-2	5-4-4	1.3			<input checked="" type="checkbox"/>
				Orange, yellow, yellow-gray, dark brown fine SAND, little to some medium to coarse sand, little clay (wet)		<input checked="" type="checkbox"/>	S-3	3-4-4	1.3			
10	35		SM	Orange-brown, red-brown, yellow-brown, black fine SAND, little silt, trace gravel, trace medium to coarse sand (wet)		<input checked="" type="checkbox"/>	S-4	2-1-3	1.5			
15	30			Orange, orange-brown, red-brown, yellow-orange fine SAND, some medium to coarse sand, little to trace silt, trace gravel (wet)		<input checked="" type="checkbox"/>	S-5	4-4-6	1.4			

NOTES:

- Test boring terminated at ± 15.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 4.7 feet b.e.g.s.
- Water elevation at 4.7 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 15 feet b.e.g.s.
- Borehole caved at 3.6 feet b.e.g.s. with water level at 3.3 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 22, 2010
 Date Completed : November 22, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 47.5 feet ± Project Datum

Depth in feet	Surf. Elev. 47.5 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
				DESCRIPTION								
0												
			ML			<input checked="" type="checkbox"/>	S-1A					
						<input checked="" type="checkbox"/>	S-1B	1-3-9	1.4			
45						<input checked="" type="checkbox"/>	S-2	4-3-6	1.1			
						<input checked="" type="checkbox"/>	S-3	1-3-1	0.9			
5						<input checked="" type="checkbox"/>	S-4	2-1-2	1.5			
						<input checked="" type="checkbox"/>	S-5	3-2-3	1.4			
40						<input checked="" type="checkbox"/>	S-6	6-5-8	1.3			
						<input checked="" type="checkbox"/>						
10			SM									
						<input checked="" type="checkbox"/>						
35												
						<input checked="" type="checkbox"/>						
15												
						<input checked="" type="checkbox"/>						
20												
						<input checked="" type="checkbox"/>						
25												
25												

NOTES:

- Test boring terminated at ± 20.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 5.0 feet b.e.g.s.
- Water elevation at 5.8 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 20 feet b.e.g.s.
- Borehole wet and caved at 4.9 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 22, 2010
 Date Completed : November 22, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 47.9 feet ± Project Datum

Depth in feet	Surf. Elev. 47.9 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 11 inches)								
			ML	Gray, orange-brown SILT, little to some fine sand (moist)	<input checked="" type="checkbox"/>	S-1A						
				Gray, orange, orange-brown, black fine SAND, trace medium to coarse sand, trace gravel, trace silt (moist)	<input checked="" type="checkbox"/>	S-1B	3-4-11	1.4				
45				Orange-brown, yellow-gray, gray fine SAND, little to some medium to coarse sand, trace gravel, trace silt (moist)	<input checked="" type="checkbox"/>	S-2	7-7-7	1.4				
5				Orange-brown, red-brown, light gray fine SAND, little silt, trace medium to coarse sand (wet)	<input checked="" type="checkbox"/>	S-3	2-3-5	1.4				<input checked="" type="checkbox"/>
40			SM	Orange-brown, red-brown fine SAND, trace gravel, trace medium to coarse sand, trace silt (wet)	<input checked="" type="checkbox"/>	S-4	3-3-4	1.5				
10				Orange-brown fine to medium SAND, little coarse sand, trace gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-5	4-4-4	1.4				
35												
15												
30												
20												
25												
25												

NOTES:

- Test boring terminated at ± 15.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-rod conditions observed at 5.5 feet b.e.g.s.
- Water elevation at 5.7 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 15 feet b.e.g.s.
- Borehole caved at 4.2 feet b.e.g.s. with water level at 3.3 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 19, 2010
 Date Completed : November 22, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 50.9 feet ± Project Datum

Depth in feet	Surf. Elev. 50.9 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL	
				<input type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling								
DESCRIPTION													
0				TOPSOIL (± 9 inches)									
50			ML	Brown, orange-brown SILT and fine SAND (moist)	<input checked="" type="checkbox"/>	S-1	2-2-3	1.3	16.6	58.2			
5			SM	Gray, orange-brown SILT, little to some fine sand (moist)	<input checked="" type="checkbox"/>	S-2A	5-13-5	1.5					
				Orange-brown, brown, white fine SAND, little silt, trace medium to coarse sand, trace gravel (moist)	<input checked="" type="checkbox"/>	S-2B							
45				Orange-brown, dark brown fine SAND, trace silt, trace medium to coarse sand (moist to wet)	<input checked="" type="checkbox"/>	S-3	5-6-3	1.2					
10				Orange-brown, yellow-white, red-brown fine SAND, trace gravel, trace silt, trace medium to coarse sand (wet)	<input checked="" type="checkbox"/>	S-4	1-2-3	1.2					
40				Orange-brown, red-brown, black fine SAND, little gravel, little medium to coarse sand, trace silt (wet)	<input checked="" type="checkbox"/>	S-5	2-2-7	1.5					
35				Orange-brown, red-brown, black, yellow fine SAND, some medium to coarse sand, little silt, trace gravel (wet)	<input checked="" type="checkbox"/>	S-6	5-6-5	1.5					
20													
30													
25													
25													

NOTES:

- Test boring terminated at ± 20.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 5.0 feet b.e.g.s.
- Water elevation at 4.6 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 20 feet b.e.g.s.
- Borehole caved at 6.8 feet b.e.g.s. with water level at 6.7 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 22, 2010
 Date Completed : November 22, 2010
 Logged by : ARS
 Weather : Clear, 50's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 50.3 feet ± Project Datum

Depth in feet	Surf. Elev. 50.3 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				Remolded	During Drilling							
DESCRIPTION												
0	50			TOPSOIL (± 12 inches)								
			ML	Brown, orange-brown, orange SILT, little to some fine sand, trace coarse sand (moist)		S-1	1-1-2	1.4				
5	45		SM	Orange-brown, brown, white fine SAND, little gravel, little medium to coarse sand, trace silt (moist)		S-2	11-12-14	1.4				
				Orange-brown, gray, yellow, orange-yellow fine SAND, little silt, trace gravel (moist to wet)		S-3	4-4-4	1.3				
10	40			Orange-brown, red-orange fine SAND, trace silt, trace medium to coarse sand (wet)		S-4	3-3-6	1.5				
15	35			Orange-brown, red-brown, black-brown fine SAND, trace gravel, trace medium to coarse sand, trace silt (wet)		S-5	3-3-5	1.5				
20	30											
25	25											

NOTES:

- Test boring terminated at ± 15.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 7.3 feet b.e.g.s.
- Water elevation at 7.5 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 15 feet b.e.g.s.
- Borehole wet and caved at 5.7 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 23, 2010
 Date Completed : November 23, 2010
 Logged by : ARS
 Weather : Clear, 50's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 48.0 feet ± Project Datum

Depth in feet	Surf. Elev. 48.0 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (±13 inches)								
			ML	Gray, dark gray, orange SILT, some fine sand (moist)		<input checked="" type="checkbox"/>	S-1A					
				Gray, dark gray, orange fine SAND, little silt (moist)		<input checked="" type="checkbox"/>	S-1B	2-3-5	1.4			
45				Light gray, gray, white fine SAND, little to some gravel, little medium to coarse sand, trace silt (moist)		<input checked="" type="checkbox"/>	S-2	1-6-7	1.5			
5				Orange-brown, gray fine SAND, little silt, trace medium to coarse sand, trace gravel (wet)		<input checked="" type="checkbox"/>	S-3	4-4-3	1.4			<input checked="" type="checkbox"/>
40				Orange-brown, red-brown fine SAND, trace to little silt, trace medium to coarse sand, trace gravel (wet)		<input checked="" type="checkbox"/>	S-4	1-3-3	1.5			
10			SM									
35				Orange-brown, red-brown fine SAND, little silt, trace medium to coarse sand, trace gravel (wet)		<input checked="" type="checkbox"/>	S-5	2-1-2	1.5			
15												
30				Orange-brown, red-brown, black fine SAND, little to some gravel, trace silt, trace medium to coarse sand (wet)		<input checked="" type="checkbox"/>	S-6	4-4-4	1.4			
20												
25												
25												

NOTES:

- Test boring terminated at ± 20.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 6.0 feet b.e.g.s.
- Water elevation at 6.3 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 20 feet b.e.g.s.
- Borehole caved at 6.4 feet b.e.g.s. with water level at 3.8 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 22, 2010
 Date Completed : November 22, 2010
 Logged by : ARS
 Weather : Clear, 50's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 48.5 feet ± Project Datum

Depth in feet	Surf. Elev. 48.5 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 8 inches)								
				Gray, orange fine SAND, some silt (moist)	<input checked="" type="checkbox"/>	S-1	3-3-3	1.2				
45				Orange-brown, gray, red-brown, white fine SAND, some gravel, little silt, little to trace medium to coarse sand (moist)	<input checked="" type="checkbox"/>	S-2	4-5-8	1.4				
5			SM	Orange-brown, red-brown, yellow-brown, white fine SAND, little silt, little medium to coarse sand, trace gravel (wet)	<input checked="" type="checkbox"/>	S-3	3-5-4	1.5				<input checked="" type="checkbox"/>
40				Orange-brown, yellow-brown, red-brown fine SAND, little silt, little medium to coarse sand, trace gravel (wet)	<input checked="" type="checkbox"/>	S-4	3-4-7	1.5				
10				Orange-brown, red-brown fine to medium SAND, little to some coarse sand, little gravel, trace silt (wet)	<input checked="" type="checkbox"/>	S-5	3-2-4	1.5				
35												
15												
30												
20												
25												
25												

NOTES:

- Test boring terminated at ± 15.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 6.0 feet b.e.g.s.
- Water elevation at 5.9 feet b.e.g.s. during drilling.
- Drilling methods were Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 15 feet b.e.g.s.
- Borehole caved at 5.0 feet b.e.g.s. with water level at 4.7 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 23, 2010
 Date Completed : November 23, 2010
 Logged by : ARS
 Weather : Clear, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 53.0 feet ± Project Datum

Depth in feet	Surf. Elev. 53.0 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
DESCRIPTION												
0				TOPSOIL (± 7 inches)								
			ML	Brown SILT, little to some fine sand (moist)		<input checked="" type="checkbox"/>	S-1A S-1B	2-3-3	1.4			
50				Brown fine SAND, little medium to coarse sand, trace silt (moist)		<input checked="" type="checkbox"/>	S-2	3-5-5	1.5			
5				Brown, yellow-brown, red-brown, white fine SAND, some medium to coarse sand, trace gravel, trace silt (moist)		<input checked="" type="checkbox"/>	S-3	6-10-10	1.5			
45				Orange-brown, gray, red-gray, white fine SAND, some medium sand, trace coarse sand, trace gravel, trace silt (moist)		<input checked="" type="checkbox"/>	S-4	4-3-4	1.4			
10			SM	Varicolored (yellow-brown, gray, red-brown, white) fine SAND, little gravel, little medium to coarse sand, trace silt (moist to wet)		<input checked="" type="checkbox"/>	S-5	3-3-3	1.5			<input checked="" type="checkbox"/>
40				Yellow-brown, orange-brown, red-brown, gray-brown fine to medium SAND, little to some gravel, little coarse sand, trace to little silt (wet)		<input checked="" type="checkbox"/>	S-6	3-2-3				
15				Orange-brown, red-brown, gray, black fine SAND, some to and medium to coarse sand, little gravel, little to trace silt (wet)		<input checked="" type="checkbox"/>						
35												
20												
30												
25												

NOTES:

- Test boring terminated at ± 20.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 8.8 feet b.e.g.s.
- Water elevation at 9.9 feet b.e.g.s. with augers at 8.5 feet b.e.g.s. after obtaining sample S-4.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 20 feet b.e.g.s.
- Borehole caved at 7.3 feet b.e.g.s. with water level at 6.8 feet b.e.g.s. upon removal of augers.
- Borehole caved at 7.3 feet b.e.g.s. with water level at 6.8 feet b.e.g.s. upon removal of augers.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 23, 2010
 Date Completed : November 23, 2010
 Logged by : ARS
 Weather : Clear, 50's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 49.4 feet ± Project Datum

Depth in feet	Surf. Elev. 49.4 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling							
0												
						<input checked="" type="checkbox"/>	S-1	3-2-3	1.5			
45						<input checked="" type="checkbox"/>	S-2	3-4-5	1.5			
5						<input checked="" type="checkbox"/>	S-3	3-3-2	1.5			
						<input checked="" type="checkbox"/>	S-4	2-1-2	1.5			
40			SM			<input checked="" type="checkbox"/>	S-5	1-2-1	1.5			
15						<input checked="" type="checkbox"/>	S-6	2-1-3	1.5			
35												
30												
20												
25												
25												

NOTES:

- Test boring terminated at ± 20.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 5.5 feet b.e.g.s.
- Water elevation at 7.9 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 20 feet b.e.g.s.
- Borehole caved at 6.8 feet b.e.g.s. with water level at 5.2 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



Capital School District
 Dover High School
 Dover, DE
 Project No. 7158.GC

Date Started : November 23, 2010
 Date Completed : November 23, 2010
 Logged by : ARS
 Weather : Partly cloudy, 40's °F
 Driller/Agency : Wayne Proud/Feldmann Brothers, Inc.

Drilling Equipment : ATV Mounted Diedrich D-50
 Drilling Methods : HSA (SPT, ASTM D 1586)
 Surface Elevation : 51.7 feet ± Project Datum

Depth in feet	Surf. Elev. 51.7 ft	GRAPHIC	USCS	Sample Condition	Water Levels	SAMPLES	Sample Number	Blows per 6 inches	Recovery (ft)	Moisture Content (%)	Percent Passing 200 Sieve	WATER LEVEL	
				<input checked="" type="checkbox"/> Remolded	<input checked="" type="checkbox"/> During Drilling								
DESCRIPTION													
0				TOPSOIL (± 13 inches)									
50			SM	Red-brown, orange-brown, gray fine SAND, trace medium to coarse sand, trace gravel, trace silt (moist)	<input checked="" type="checkbox"/>	S-1	2-2-4	1.4					
				Orange-brown, gray, red-orange, light brown fine SAND, trace medium to coarse sand, trace silt (moist)	<input checked="" type="checkbox"/>	S-2	3-3-4	1.3					
5				Yellow-brown, gray, orange-brown, red-brown, white fine SAND, little to trace silt (moist)	<input checked="" type="checkbox"/>	S-3	2-4-5	1.5					
45				Gray, yellow-brown, orange, white fine SAND, trace gravel, trace medium to coarse sand, trace silt (moist to wet)	<input checked="" type="checkbox"/>	S-4	1-1-1	1.3					
10				Yellow-brown, orange-brown, red-brown, white fine SAND, little to some medium to coarse sand, trace silt (wet)	<input checked="" type="checkbox"/>	S-5	2-2-2	1.5					
40													
15													
35													
20													
30													
25													
25													

NOTES:

- Test boring terminated at ± 15.0 feet b.e.g.s. (below existing ground surface).
- Ground surface elevations estimated based on drawing titled "Boring Locations - As Staked 2010-10-29," prepared by Becker Morgan Group, dated October 21, 2010.
- Wet-on-spoon conditions observed at 8.0 feet b.e.g.s.
- Water elevation at 9.0 feet b.e.g.s. during drilling.
- Drilling methods utilized: Hollow Stem Augers from 0 to 10 feet b.e.g.s. and mud rotary from 10 to 15 feet b.e.g.s.
- Borehole caved at 5.6 feet b.e.g.s. with water level at 4.1 feet b.e.g.s. upon removal of augers.
- Borehole backfilled with soil cuttings upon completion.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 3, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
TP-1	0 – 0.7	TOPSOIL
(Elev. 46.2 feet)	0.7 – 2.0 Sample No. 1 @ 1.5'	Light brown SILT, little fine sand (moist, medium stiff consistency)
	2.0 – 4.0 Sample No. 2 @ 3'	Orange-brown fine SAND, some silty clay, trace medium sand (moist, medium density, slightly plastic)
	4.0 – – – Sample No. 3 @ 6'	Light brown fine to medium SAND, trace to little clay, trace rounded gravel (wet, medium density, plastic, mottled at 4 feet)

NOTES:

- (1) Test pit excavated by Feldmann Brothers, Inc. personnel utilizing a rubber tired backhoe.
- (2) Ground surface elevations estimated based on grade marks provided on a drawing titled, "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," dated October 21, 2010, prepared by Becker Morgan Group.
- (3) Test pit terminated approximately 12 feet below the existing ground surface (b.e.g.s.).
- (4) Moderate groundwater seepage was observed in the test pit at a depth of 6 feet b.e.g.s.
- (5) Seasonal high water table estimated to be approximately 4 ft b.e.g.s. based on observed redoximorphic features.
- (6) Extensive sidewall caving was observed during the excavation of the test pit below 6 feet b.e.g.s. then below 2 ft b.e.g.s. after completion of the test pit.
- (7) Test pit caved and dry at 6 feet b.e.g.s. upon completion due to sidewall caving.
- (8) Test pit backfilled with excavated soils upon completion.
- (9) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 3, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
TP-2	0 – 1.1	TOPSOIL
(Elev. 46.4 feet)	1.1 – 2.0 Sample No. 1 @ 1.5'	Light brown, light gray-brown silty CLAY, trace fine sand (moist, medium stiff consistency)
	2.0 – – – Sample No. 2 @ 2.5' Sample No. 3 @ 5.5'	Light brown, orange-brown, light gray fine to medium SAND, trace to little clay, trace rounded gravel (moist to wet, medium to loose density, plastic, mottled at 4 feet)

NOTES:

- (1) Test pit excavated by Feldmann Brothers, Inc. personnel utilizing a rubber tired backhoe.
- (2) Ground surface elevations estimated based on grade marks provided on a drawing titled, "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," dated October 21, 2010, prepared by Becker Morgan Group.
- (3) Test pit terminated approximately 11 feet below the existing ground surface (b.e.g.s.).
- (4) Rapid groundwater seepage was observed in the test pit at a depth of 5 feet b.e.g.s.
- (5) Seasonal high water table estimated to be approximately 4 ft b.e.g.s. based on observed redoximorphic features.
- (6) Extensive sidewall caving was observed during the excavation of the test pit below 6 feet b.e.g.s.
- (7) Test pit caved at 8 feet b.e.g.s. with water level at 8 feet b.e.g.s. upon completion.
- (8) Test pit backfilled with excavated soils upon completion.
- (9) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 3, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
TP-3	0 – 0.8	TOPSOIL
(Elev. 51.7 feet)	0.8 – 3.0 Sample No. 1 @ 3'	Brown, light gray-brown, light brown, mottled clayey SILT, little to some fine sand (moist, medium consistency)
	3.0 – – – Sample No. 2 @ 4.5' Sample No. 3 @ 8.5' Sample No. 4 @ 9' Sample No. 5 @ 12'	Light gray, light brown fine SAND, little to trace clay, trace medium sand, trace rounded gravel (moist to wet, medium to loose density, mottled at 4 feet, plastic)

NOTES:

- (1) Test pit excavated by Feldmann Brothers, Inc. personnel utilizing a rubber tired backhoe.
- (2) Ground surface elevations estimated based on grade marks provided on a drawing titled, "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," dated October 21, 2010, prepared by Becker Morgan Group.
- (3) Test pit terminated approximately 13 feet below the existing ground surface (b.e.g.s.).
- (4) Moderate groundwater seepage was observed in the test pit at a depth of 8.5 feet b.e.g.s.
- (5) Seasonal high water table estimated to be approximately 3.5 ft b.e.g.s. based on observed redoximorphic features.
- (6) Moderate sidewall caving was observed during the excavation of the test pit below 8.5 feet b.e.g.s.
- (7) Test pit caved and dry at 12 feet b.e.g.s. upon completion.
- (8) Test pit backfilled with excavated soils upon completion.
- (9) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 3, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
TP-4	0 – 0.9	TOPSOIL
(Elev. 51.4 feet)	0.9 – 4.0 Sample No. 1 @ 2.5'	Brown, orange-brown, light brown fine SAND, little clay, trace medium sand (moist, loose to medium density, plastic)
	4.0 – 8.0 Sample No. 2 @ 4.5'	Light brown fine SAND, trace clay, trace medium sand (moist, loose density, slightly plastic, slightly mottled at 4 to 4.5 feet)
	8.0 – – – Sample No. 3 @ 8' Sample No. 4 @ 12.5'	Light gray, yellow-brown, fine SAND, trace clay, trace medium sand lenses, trace rounded gravel (moist to wet, loose to medium density, mottled from 8 to 9 feet, plastic)

NOTES:

- (1) Test pit excavated by Feldmann Brothers, Inc. personnel utilizing a rubber tired backhoe.
- (2) Ground surface elevations estimated based on grade marks on a drawing titled, "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," dated October 21, 2010, prepared by Becker Morgan Group.
- (3) Test pit terminated approximately 14 feet below the existing ground surface (b.e.g.s.).
- (4) Moderate groundwater seepage was observed in the test pit at a depth of 10.5 feet b.e.g.s.
- (5) Seasonal high water table estimated to be approximately 4.5 ft b.e.g.s. based on observed redoximorphic features.
- (6) Extensive sidewall caving was observed during the excavation of the test pit below 7 feet b.e.g.s. then below 2 ft b.e.g.s. after completion of the test pit.
- (7) Test pit caved at 12 feet b.e.g.s. with water level at 11.5 feet b.e.g.s. upon completion.
- (8) Test pit backfilled with excavated soils upon completion.
- (9) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 3, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
TP-5	0 – 1.0	TOPSOIL
(Elev. 53.3 feet)	1.0 – 3.0 Sample No. 1 @ 2'	Brown fine SAND and clayey silt, trace medium sand (moist, medium density, slightly plastic)
	3.0 – 5.0 Sample No. 2 @ 4'	Brown fine SAND, little clayey silt, trace medium sand (moist, loose to medium density, slightly plastic)
	5.0 – -- Sample No. 3 @ 7' Sample No. 4 @ 9.5' Sample No. 5 @ 14'	Light gray, brown, light brown, fine SAND, trace clay, trace medium sand, trace rounded gravel (moist to wet, loose to medium density, slightly mottled at 7.5 feet, slightly plastic)

NOTES:

- (1) Test pit excavated by Feldmann Brothers, Inc. personnel utilizing a rubber tired backhoe.
- (2) Ground surface elevations estimated based on grade marks on a drawing titled, "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," dated October 21, 2010, prepared by Becker Morgan Group.
- (3) Test pit terminated approximately 14.5 feet below the existing ground surface (b.e.g.s.).
- (4) Moderate groundwater seepage was observed in the test pit at a depth of 11.5 feet b.e.g.s.
- (5) Seasonal high water table estimated to be approximately 7.5 ft b.e.g.s. based on observed redoximorphic features.
- (6) Moderate sidewall caving was observed during the excavation of the test pit below 8.5 feet b.e.g.s.
- (7) Test pit caved at 11.5 feet b.e.g.s. with water level at 11.3 feet b.e.g.s. 1 hour after completion.
- (8) Test pit backfilled with excavated soils upon completion.
- (9) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 9, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
I-1A	0 – 1.0	TOPSOIL
(Elev. 43.7 feet)	1.0 – 2.4 Sample No. 1 @ 1.5'	Light gray, dark gray silty CLAY, trace fine sand, trace organics (e.g., root material) (medium stiff consistency, moist)
	2.4 – -- Sample No. 2 @ 3.0'	Light gray, orange-brown, yellow-brown fine SAND, little to trace clayey silt (medium dense, wet)

NOTES:

- (1) Test pit excavated by Feldmann Brothers' personnel utilizing a rubber tired backhoe.
- (2) Ground surface elevations provided on a drawing titled "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," prepared by the Becker Morgan Group, dated October 21, 2010.
- (3) Test pit terminated approximately 4.0 feet below the existing ground surface (b.e.g.s.).
- (4) Moderate groundwater seepage was observed in the test pit at a depth of 3.5 ft b.e.g.s. during excavation.
- (5) Slight sidewall caving of excavation side walls observed from approximately 3.0 feet b.e.g.s., 0.5 hours after completion of excavation.
- (6) Water level at 3.6 feet b.e.g.s., bottom of excavation at 3.9 ft. b.e.g.s., 1 hour after completion of excavation.
- (7) Seasonal high water table estimated to be approximately 1 ft b.e.g.s. based on observed redoximorphic features.
- (8) Test pit backfilled with excavated soils upon completion.
- (9) Test pit offset approximately 30 ft northeast after obstructing a terracotta pipe (apparent field drainage pipe) approximately 2.5 ft b.e.g.s. at staked location.
- (10) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 9, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
I-2	0 – 0.5	TOPSOIL
(Elev. 45.0 feet)	0.5 – 2.5 Sample No. 1A @ 1.5' Sample No. 2A @ 1.6'	Light gray, orange-brown clayey SILT (mottled), some fine sand (stiff consistency, moist) Lab results for sample S-2A <ul style="list-style-type: none">• Moisture: 15%• Percent passing No. 270 sieve: 76%• USDA: Silty Loam• USCS: ML
	2.5 – 4.7 Sample No. 2 @ 3.5'	Light gray fine SAND, trace to little medium sand, trace silty clay, trace rounded gravel (loose to medium dense, moist to wet)
	4.7 – -- Sample No. 3 @ 5.5'	Orange-brown, light gray, yellow-brown fine SAND (mottled), little medium sand, trace to little gravel, trace clay (medium dense, wet)

NOTES:

- 1) Test pit excavated by Feldmann Brothers' personnel utilizing a rubber tired backhoe.
- 2) Ground surface elevations provided on a drawing titled "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," prepared by the Becker Morgan Group, dated October 21, 2010.
- 3) Test pit terminated approximately 7.0 feet below the existing ground surface (b.e.g.s.).
- 4) Rapid groundwater seepage was observed in the test pit at a depth of 6.0 ft b.e.g.s. during excavation.
- 5) Moderate sidewall caving of excavation side walls observed from approximately 3.0 to 6.0 feet b.e.g.s., 0 to 1 hours after completion of excavation.
- 6) Water level at 2.8 feet b.e.g.s., 0 to 1 hour after completion of excavation.
- 7) Seasonal high water table estimated to be approximately 0.5 ft b.e.g.s. based on observed redoximorphic features.
- 8) Single ring infiltration test performed at approximately 1.5 feet b.e.g.s.
- 9) Test pit backfilled with excavated soils upon completion.
- 10) Terracotta pipe (apparent field drainage pipe) obstructed approximately 2 ft b.e.g.s. at staked location.
- 11) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 9, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
I-3	0 – 0.6	TOPSOIL
(Elev. 47.0 feet)	0.6 – 2.6 Sample No. 1 @ 0.6'	Gray-brown, orange-brown silty CLAY (slightly mottled), little fine sand (medium consistency, moist)
	2.6 – 5.5 Sample No. 2 @ 3.5' Sample No. 3 @ 3.8'	Gray-brown, light gray, orange-brown fine SAND (slightly mottled), some silty clay, trace rounded gravel (medium dense, moist) Lab results for sample S-3 <ul style="list-style-type: none">• Moisture: 18.6%• Percent passing No. 270 sieve: 24.6%• USDA: Sandy Loam• USCS: SM (cemented sands 3.7 to 4.2 feet b.e.g.s)
	5.5 – -- Sample No. 4 @ 6.5'	Light brown fine to medium SAND, trace to little silty clay (loose density, wet)

NOTES:

- 1) Test pit excavated by Feldmann Brothers' personnel utilizing a rubber tired backhoe.
- 2) Ground surface elevations provided on a drawing titled "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," prepared by the Becker Morgan Group, dated October 21, 2010.
- 3) Test pit terminated approximately 7.0 feet below the existing ground surface (b.e.g.s.).
- 4) Rapid groundwater seepage was observed in the test pit at a depth of 5.5 ft b.e.g.s. during excavation.
- 5) Moderate sidewall caving of excavation side walls observed from approximately 5.0 to 7.0 feet b.e.g.s. during excavation.
- 6) Water level at 5.6 feet b.e.g.s., bottom of excavation at 6.0 ft. b.e.g.s. at completion of excavation.
- 7) Seasonal high water table estimated to be approximately 3 ft b.e.g.s. based on observed redoximorphic features.
- 8) Single ring infiltration test performed at approximately 3.5 feet b.e.g.s.
- 9) Test pit backfilled with excavated soils upon completion.
- 10) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 9, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
I-4	0 – 0.8	TOPSOIL
(Elev. 49.7 feet)	0.8 – 3.2 Sample No. 1 @ 2.0'	Light brown clayey SILT, little fine sand, trace rounded gravel (medium consistency, moist)
	3.2– 3.8	Orange-brown, red-brown fine SAND, little silty clay, trace rounded gravel (dense, moist)
	3.8 – 4.5	Gray, orange-brown SILT (mottled), little fine sand, trace clay (stiff consistency, moist)
	4.5 – – – Sample No. 2 @ 4.5' Sample No. 3 @ 5'	Light orange-brown fine SAND, some silty clay (medium dense, moist) Lab results for sample S-3 <ul style="list-style-type: none">• Moisture: 18.1%• Percent passing No. 270 sieve: 19.7%• USDA: Sandy Loam• USCS: SM

NOTES:

1. Test pit excavated by Feldmann Brothers' personnel utilizing a rubber tired backhoe.
2. Ground surface elevations provided on a drawing titled "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," prepared by the Becker Morgan Group, dated October 21, 2010.
3. Test pit terminated approximately 9.0 feet below the existing ground surface (b.e.g.s.).
4. Moderate groundwater seepage was observed in the test pit at a depth of 8.0 ft b.e.g.s. during excavation.
5. Moderate sidewall caving of excavation side walls observed from approximately 7.0 to 9.0 feet b.e.g.s. during excavation.
6. Water level at 8.5 feet b.e.g.s., bottom of excavation at 8.8 ft. b.e.g.s. at completion of excavation.
7. Seasonal high water table estimated to be approximately 5.8 ft b.e.g.s. based on observed redoximorphic features.
8. Single ring infiltration test performed at approximately 4.5 feet b.e.g.s.
9. Test pit backfilled with excavated soils upon completion.
10. Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 9, 2010

LOGGED BY: TRA

<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
I-5	0 – 0.8	TOPSOIL
(Elev. 52.8 feet)	0.8 – 2.1 Sample No. 1 @ 1.5'	Orange, light brown, dark brown silty CLAY, trace fine sand (stiff consistency, moist)
	2.1 – 3.2 Sample No. 2 @ 2.5	Brown, light brown fine SAND and silty CLAY, trace medium sand (medium dense, moist)
	3.2 – -- Sample No. 3 @ 3.8' Sample No. 4 @ 4.0'	Light brown, light gray fine to medium SAND, some silty clay, trace rounded gravel (medium dense, moist) Lab results for sample S-4 <ul style="list-style-type: none">• Moisture: 15.2%• Percent passing No. 270 sieve: 20.4%• USDA: Sandy Loam• USCS: SM
	Sample No. 5 @ 6.5'	Light brown, light gray fine to medium SAND, little silty clay, trace rounded gravel (medium dense, wet)

NOTES:

- (1) Test pit excavated by Feldmann Brothers' personnel utilizing a rubber tired backhoe.
- (2) Ground surface elevations provided on a drawing titled "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," prepared by the Becker Morgan Group, dated October 21, 2010.
- (3) Test pit terminated approximately 7.5 feet below the existing ground surface (b.e.g.s.).
- (4) No groundwater seepage or sidewall caving observed during the excavation of the test pit.
- (5) No apparent redoximorphic features indicating seasonal high water table observed.
- (6) Single ring infiltration test performed at approximately 4 feet b.e.g.s.
- (7) Test pit backfilled with excavated soils upon completion.
- (8) Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.



DUFFIELD ASSOCIATES

Consultants in the Geosciences

TEST PIT DESCRIPTIVE LOG

PROJECT: Dover High School

PROJECT NO.: 7158.GC

CLIENT: Becker Morgan Group

DATE: November 9, 2010

LOGGED BY: TRA

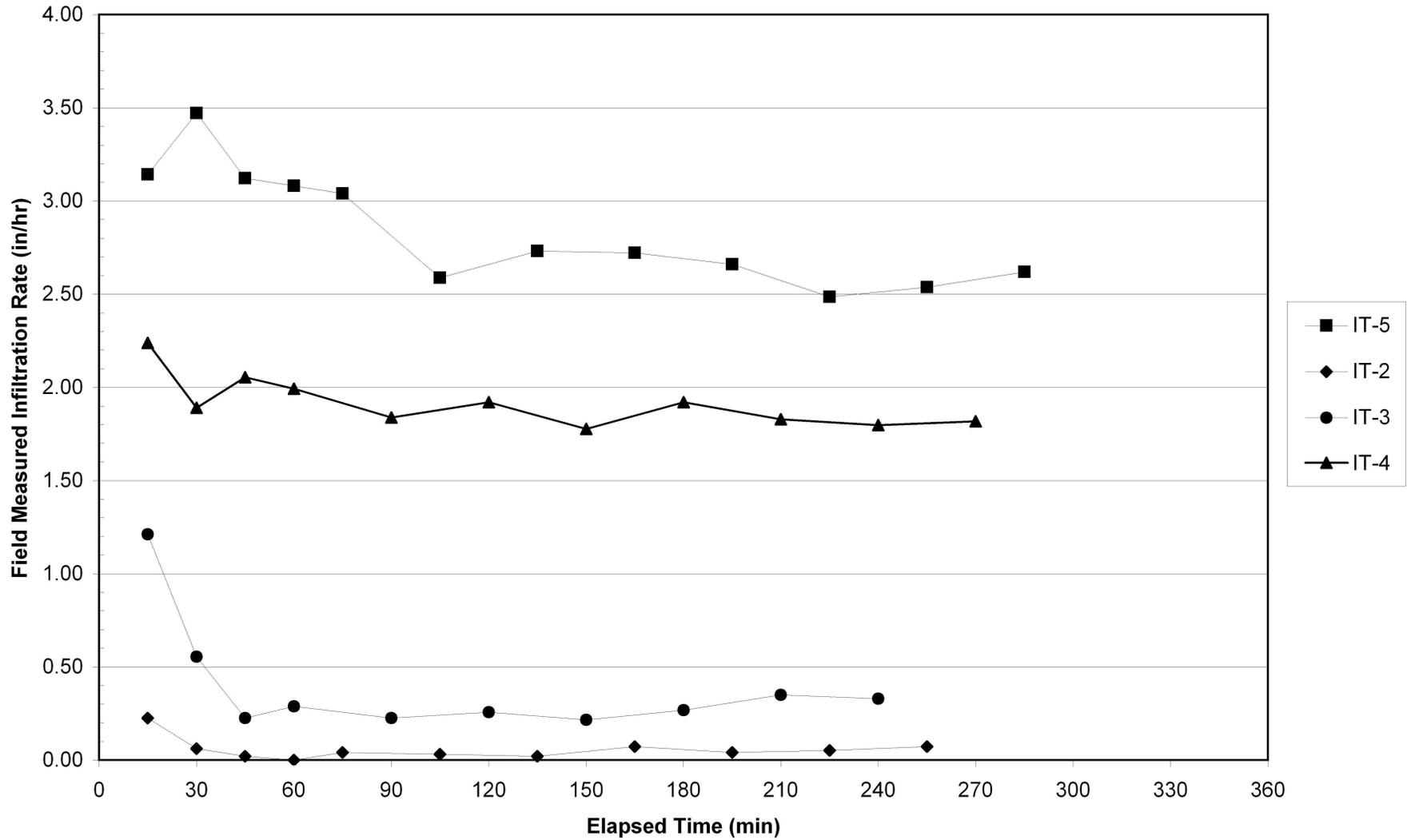
<u>Test Pit No.</u>	<u>Depth Range (feet below existing ground surface)</u>	<u>Generalized Soil Description</u>
I-6	0 – 0.7	TOPSOIL
(Elev. 49.7 feet)	0.7 – 2.3 Sample No. 1 @ 1.5'	Light gray-brown silty CLAY, little fine sand (medium consistency, moist)
	2.3 – 6.0 Sample No. 2 @ 4.0'	Light gray-brown, orange-brown fine SAND (slightly mottled) some to and silty CLAY, trace medium sand (medium dense, moist)
	6.0 – --- Sample No. 3 @ 8.0'	Orange-brown, light gray fine SAND (slightly mottled), little silty clay, trace medium sand (medium dense, wet)

NOTES:

1. Test pit excavated by Feldmann Brothers' personnel utilizing a rubber tired backhoe.
2. Ground surface elevations provided on a drawing titled "Dover High School Capital School District, Boring Locations – As Staked 2010-10-29," prepared by the Becker Morgan Group, dated October 21, 2010.
3. Test pit terminated approximately 11.0 feet below the existing ground surface (b.e.g.s.).
4. Slight groundwater seepage was observed in the test pit at a depth of 9.0 ft b.e.g.s.
5. Slight sidewall caving of excavation side walls observed from approximately 7.0 to 9.0 feet b.e.g.s., 0.5 hours after completion of excavation.
6. Water level at 8.5 feet b.e.g.s., bottom of excavation at 9.0 ft. b.e.g.s. 1.0 hour after completion of excavation.
7. Seasonal high water table estimated to be approximately 2.5 ft b.e.g.s. based on observed redoximorphic features.
8. Test pit backfilled with excavated soils upon completion.
9. Soil descriptions and classifications were performed in general accordance with ASTM D:2488 (Visual-Manual Procedure) and ASTM D:2487 (Unified Soil Classification System) along with laboratory analysis if analysis was performed.

Proposed Dover High School Capital School District

Infiltration Test Results Plot



APPENDIX C

GENERAL NOTES

GENERAL NOTES

DUFFIELD ASSOCIATES uses the following definitions and terminology to classify and correlate the field and laboratory samples.

VISUAL UNIFIED CLASSIFICATIONS: The soil samples are described by color, major constituent, modifiers (by percentage), and density (or consistency). Coarse Grained or Granular Soils have more than 50% of their dry weight retained on a No. 200 sieve; they are described as: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a No. 200 sieve; they are described as: clays or clayey silts if they are cohesive and silts if they are noncohesive. In addition to gradation, granular soils are defined on the basis of their relative in-place density and fine grained soils on the basis of their strength or consistency and their plasticity.

The Unified Soil Classification symbols are:

COARSE GRAINED SOILS

GW - Well graded gravels
 GP - Poorly graded gravels
 GM - Silty gravels
 GC - Clayey gravels
 SW - Well graded sands
 SP - Poorly graded sands
 SM - Silty sands
 SC - Clayey sands

SIZE DESCRIPTION

F - Fine
 M - Medium
 C - Coarse
 G - Gravel

COLOR

Or - Orange	Blk - Black
Yel - Yellow	Gr - Gray
Br - Brown	R - Red

FINE GRAINED SOILS

ML - Silts of low plasticity
 CL - Clays of low to medium plasticity
 OL - Organic silt clays of low plasticity
 MH - Silts of high plasticity
 CH - Clays of high plasticity
 OH - Organic silt clays of high plasticity
 PT - Peat and highly organic soils

MODIFIERS (PERCENTAGE)

Tr - Trace	1 - 10%
Ltl - Little	11 - 20%
Some	21 - 35%
& - And	36 - 50%

DENSITY: COARSE GRAINED SOILS

Very loose	4 blows/ft or less
Loose	5 to 10 blows/ft
Medium	11 to 30 blows/ft
Dense	31 to 50 blows/ft
Very Dense	51 blows/ft or more

CONSISTENCY: FINE GRAINED SOILS

Very soft	2 blows/ft or less
Soft	3 to 4 blows/ft
Medium	5 to 8 blows/ft
Stiff	9 to 15 blows/ft
Very stiff	16 to 30 blows/ft
Hard	31 blows/ft or more

NOTE: The Standard Penetration Test "N" value is the number of blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split spoon sampler, except where otherwise noted.

Capital School District
New Dover High School
Bid Package 'G'

Contract NDHS-33: Site, Field, Stadiums and Accessories

BID FORM

For Bids Due: _____

To: Capital School District
945 Forest Street
Dover, Delaware 19904

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

Alternate BPG-27: Add for Enlarged Football Bleacher Design – Main Stadium.

Add/Deduct _____ (\$ _____)

Alternate BPG-28: Add Soccer Bleachers – Auxiliary Stadium.

Add/Deduct _____ (\$ _____)

**Capital School District
New Dover High School
Bid Package 'G'**

Alternate BPG-29: Add (4) Tennis Courts.

Add/Deduct _____ (\$ _____)

Alternate BPG-30: Add Ticket Booths and Signage Structures – Main & Auxiliary Stadium.

Add/Deduct _____ (\$ _____)

Alternate BPG-31: Add Canopies above Entry Gates – Main Stadium.

Add/Deduct _____ (\$ _____)

Alternate BPG-32: Add Lighting / Light Bases at Tennis Courts.

Add/Deduct _____ (\$ _____)

Alternate BPG-33: Add Lighting / Light Bases at Baseball / Softball Stadiums.

Add/Deduct _____ (\$ _____)

Alternate BPG-34: Add for "Blue" Color for all Synthetic Running Surfaces (in lieu of "Red").

Add/Deduct _____ (\$ _____)

Alternate BPG-35: Add Synthetic Athletic Turf at Main Baseball / Main Softball Stadium's playing surfaces.

Add/Deduct _____ (\$ _____)

Alternate BPG-36: Add Unit Paving Areas (in lieu of Scored Concrete).

Add/Deduct _____ (\$ _____)

Alternate BPG-37: Add Flagpole Plinth Monuments.

Add/Deduct _____ (\$ _____)

UNIT PRICES

N/A

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

**Capital School District
New Dover High School
Bid Package 'G'**

This bid shall remain valid and cannot be withdrawn for one hundred twenty (120) days (Project Manager's Note: Verify and coordinate with Section 00 21 13 Instruction to Bidders.) from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Sub-Contractor List
- Non-Collusion Statement
- Bid Bond
- Consent of Surety
- (Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>
1. <u>Synthetic Turf</u>	_____	_____
2. <u>Grandstands</u>	_____	_____
3. <u>Electrical</u>	_____	_____
4. _____	_____	_____
5. _____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract NDHS-33 Site, Field, Stadiums and Accessories has been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of
_____ in the County of _____ and State of _____ as
Principal, and _____ of _____ in the County of _____
_____ and State of _____ as Surety, legally authorized to do business in the State of Delaware
("State"), are held and firmly unto the Capital School District in the sum of _____ Dollars
(S _____), or percent not to exceed _____
Dollars (S _____) of amount of bid on Contract No. _____ to be paid to the Capital
School District for the use and benefit of the Capital School District for which payment well and truly to be made, we do
bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the
whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the
Capital School District a certain proposal to enter into this contract for the furnishing of certain material and/or services
within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this
Contract as may be required by the terms of this Contract and approved by the Capital School District this Contract to be
entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said
proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____ day of _____ in the year of our Lord two thousand
and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate Seal	By: _____ Authorized Signature
Attest _____	_____ Title
Witness _____	_____ Name of Surety
	_____ Title

CONSENT OF SURETY

DATE _____

To: Capital School District
945 Forest Street
Dover, Delaware 19904

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 8 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

END OF SECTION

Capital School District
New Dover High School
Bid Package 'G'

Contract NDHS-34: General Construction

BID FORM

For Bids Due: _____

To: Capital School District
945 Forest Street
Dover, Delaware 19904

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____

E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

Phone No.: () _____ - _____

Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

Alternate BPG-25: Add Remote Athletics Building.

Add/Deduct _____ (\$ _____)

Alternate BPG-26: Add Maintenance Building

Add/Deduct _____ (\$ _____)

**Capital School District
New Dover High School
Bid Package 'G'**

Alternate BPG-30: Add Ticket Booths and Signage Structures – Main & Auxiliary Stadium.

Add/Deduct _____ (\$ _____)

UNIT PRICES

N/A

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for one hundred twenty (120) days (Project Manager’s Note: Verify and coordinate with Section 00 21 13 Instruction to Bidders.) from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

**Capital School District
New Dover High School
Bid Package 'G'**

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Sub-Contractor List
- Non-Collusion Statement
- Bid Bond
- Consent of Surety
- (Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>
1. <u>Masonry</u>	_____	_____
2. <u>Plumbing</u>	_____	_____
3. <u>HVAC</u>	_____	_____
4. <u>Electrical</u>	_____	_____
5. <u>Roofer</u>	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract NDHS- 34 General Construction has been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of
_____ in the County of _____ and State of _____ as
Principal, and _____ of _____ in the County of _____
_____ and State of _____ as Surety, legally authorized to do business in the State of Delaware
("State"), are held and firmly unto the Capital School District in the sum of _____ Dollars
(S _____), or percent not to exceed _____
Dollars (S _____) of amount of bid on Contract No. _____ to be paid to the Capital
School District for the use and benefit of the Capital School District for which payment well and truly to be made, we do
bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the
whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the
Capital School District a certain proposal to enter into this contract for the furnishing of certain material and/or services
within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this
Contract as may be required by the terms of this Contract and approved by the Capital School District this Contract to be
entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said
proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this ____ day of _____ in the year of our Lord two thousand
and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate Seal	By: _____ Authorized Signature
Attest _____	_____ Title
Witness _____	_____ Name of Surety
	_____ Title

CONSENT OF SURETY

DATE _____

To: Capital School District
945 Forest Street
Dover, Delaware 19904

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 8 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

END OF SECTION

**Capital School District
New Dover High School
Bid Package 'G'**

SECTION 00 52 00 - AGREEMENT

1. SUMMARY

1.1. The Agreement Form for this Project is either the American Institute of Architects Standard Form of Agreement between Owner and Contractor where the basis of payment is a Stipulated Sum 1992 Construction Manager – Advisor Edition AIA Document A101/CMa 1992 Edition.

1.2 A copy of A101/CMa – 1992 Edition is bound into this Project Manual following this page.

1.2.1 Under Article 5.8 add the following:

“Upon completion of the work under the Contract, the Owner may release 60% of the amount then retained. The balance of the amount retained will be held until:

- A. All reports required of the Contract are received;
- B. All Subcontractors in trades listed on the Bid Form are paid by the Contractor, unless the amount owed to the Subcontractor is disputed, in which case the Owner may withhold 150% of the amount withheld by the Contractor in its dispute with the Subcontractor; and
- C. Final payment is authorized by the Owner.”

END OF SECTION

Standard Form of Agreement Between Owner and Contractor

where the basis of payment is a STIPULATED SUM

1992 CONSTRUCTION MANAGER-ADVISER EDITION

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION.

The 1992 Edition of AIA Document A201/CMa, General Conditions of the Contract for Construction, Construction Manager-Adviser Edition, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

AGREEMENT

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

BETWEEN the Owner:

(Name and address)

Capital School District
945 Forest Street
Dover, Delaware 19904

and the Contractor:

(Name and address)

For the following Project:

(Include detailed description of Project, location, address and scope.)

New Dover High School

The Construction Manager is:

(Name and address)

EDiS Company
110 South Poplar Street, Suite 400
Wilmington, Delaware 19801

The Architect is:

(Name and address)

ABHA
1621 N. Lincoln Street
Wilmington, Delaware 19806

The Owner and Contractor agree as set forth below.

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ARTICLE 1
THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these 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 Modifications, appears in Article 9.

ARTICLE 2
THE WORK OF THIS CONTRACT

The Contractor shall execute the entire Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others, or as follows:

ARTICLE 3
DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

3.1 The date of commencement is the date from which the Contract Time of Paragraph 3.2 is measured, and shall be the date of this Agreement, as first written above, 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.)

Unless the date of commencement is established by a notice to proceed issued by the Owner, the Contractor shall notify the Owner, through the Construction Manager, in writing not less than five days before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

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

(Insert the calendar date or number of calendar days after the date of commencement. Also insert any requirements for earlier Substantial Completion of certain portions of the Work, if not stated elsewhere in the Contract Documents.)

Per contract documents.

, subject to adjustments of this Contract Time as provided in the Contract Documents.

(Insert provisions, if any, for liquidated damages relating to failure to complete on time.)

ARTICLE 4
CONTRACT SUM

4.1 The Owner shall pay the Contractor in current funds for the Contractor's performance of the Contract the Contract Sum of _____ Dollars (\$ _____), 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 decisions on other alternates are to be made by the Owner subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date until which that amount is valid.)

4.3 Unit prices, if any, are as follows:

ARTICLE 5
PROGRESS PAYMENTS

5.1 Based upon Applications for Payment submitted by the Contractor to the Construction Manager, and upon Project Applications and Certificates for Payment issued by the Construction Manager and 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.

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

5.3 Provided an Application for Payment is submitted to the Construction Manager not later than the 25th day of a month, the Owner shall make payment to the Contractor not later than the 7th day of the month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment shall be made by the Owner not later than thirty (30) days after the Construction Manager receives the Application for Payment.

5.4 Each Application for Payment shall be based upon the 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 and be prepared in such form and supported by such data to substantiate its accuracy as the Construction Manager or Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

5.5 Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

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

5.6.1 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 total Contract Sum allocated to that portion of the Work in the Schedule of Values, less retainage of five percent (5 %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute may be included as provided in Subparagraph 7.3.7 of the General Conditions;

5.6.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of five percent (5 %);

5.6.3 Subtract the aggregate of previous payments made by the Owner; and

5.6.4 Subtract amounts, if any, for which the Construction Manager or Architect has withheld or nullified a Certificate for Payment as provided in Paragraph 9.5 of the General Conditions.

5.7 The progress payment amount determined in accordance with Paragraph 5.6 shall be further modified under the following circumstances:

5.7.1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to one hundred percent (100 %) of the Contract Sum, less such amounts as the Construction Manager recommends and the Architect determines for incomplete Work and unsettled claims; and

5.7.2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Subparagraph 9.10.3 of the General Conditions.

5.8 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 Subparagraphs 5.6.1 and 5.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

In addition to retainage, 3.5% will be withheld for closeout documents.

This shall appear as a line item on the application for payment.

ARTICLE 6
FINAL PAYMENT

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when (1) the Contract has been fully performed by the Contractor except for the Contractor's responsibility to correct nonconforming Work as provided in Subparagraph 12.2.2 of the General Conditions and to satisfy other requirements, if any, which necessarily survive final payment; and (2) a final Project Certificate for Payment has been issued by the Construction Manager and Architect; such final payment shall be made by the Owner not more than 30 days after the issuance of the final Project Certificate for Payment, or as follows:

ARTICLE 7
MISCELLANEOUS PROVISIONS

7.1 Where reference is made in this Agreement to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

7.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

(Usury laws and requirements under the Federal Truth in Lending Act, similar state and local consumer credit laws and other regulations at the Owner's and Contractor's principal places of business, the location of the Project and elsewhere may affect the validity of this provision. Legal advice should be obtained with respect to deletions or modifications, and also regarding requirements such as written disclosures or waivers.)

7.3 Temporary facilities and services:

(Here insert temporary facilities and services which are different from or in addition to those included elsewhere in the Contract Documents.)

7.4 Other Provisions:

(Here list any special provisions affecting the Contract.)

ARTICLE 8
TERMINATION OR SUSPENSION

- 8.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of the General Conditions.
- 8.2 The Work may be suspended by the Owner as provided in Article 14 of the General Conditions.

ARTICLE 9
ENUMERATION OF CONTRACT DOCUMENTS

- 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated as follows:
- 9.1.1 The Agreement is this executed Standard Form of Agreement Between Owner and Contractor, AIA Document A101/CMA, 1992 Construction Manager-Adviser Edition.
- 9.1.2 The General Conditions are the General Conditions of the Contract for Construction, AIA Document A201/CMA, 1992 Construction Manager-Adviser Edition.
- 9.1.3 The Supplementary and other Conditions of the Contract are those contained in the Project Manual dated _____, and are as follows:

Document	Title	Pages
Specification Section 00 73 00	Supplementary Conditions	17

- 9.1.4 The Specifications are those contained in the Project Manual dated as in Subparagraph 9.1.3, and are as follows:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Section	Title	Pages
---------	-------	-------

9.1.5 The Drawings are as follows, and are dated
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

unless a different date is shown below:

Number	Title	Date
---------------	--------------	-------------

9.1.6 The Addenda, if any, are as follows:

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 Other documents, if any, forming part of the Contract Documents are as follows:

(List here any additional documents which are intended to form part of the Contract Documents. The General Conditions provide that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

- Contractor Proposal
- Bid Bond
- Letter of Intent
- Certificate of Insurance
- Performance and Payment Bonds

This Agreement is entered into as of the day and year first written above and is executed in at least four original copies of which one is to be delivered to the Contractor, one each to the Construction Manager and Architect for use in the administration of the Contract, and the remainder to the Owner.

OWNER

CONTRACTOR

(Signature)

(Signature)

(Printed name and title)

(Printed name and title)



CAUTION: You should sign an original AIA document which has this caution printed in red. An original assures that changes will not be obscured as may occur when documents are reproduced. See Instruction Sheet for Limited License for Reproduction of this document.

**Capital School District
New Dover High School
Bid Package 'G'**

SECTION 00 61 13 – BONDS

1. PAYMENT AND PERFORMANCE BONDS

1.1 Bonds must be in the following form:

1. Form of Payment Bond AIA Document A312 - 2010 (attached).
2. Form of Performance Bond AIA Document A312 - 2010 (attached).



AIA[®] Document A312[™] – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT

Date:
Amount: \$
Description:
(Name and location)

BOND

Date:
(Not earlier than Construction Contract Date)

Amount: \$
Modifications to this Bond: None See Section 18

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title:
(Any additional signatures appear on the last page of this Payment Bond.)

Signature: _____
Name and Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 16 Definitions

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

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

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

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

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

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

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

§ 18 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL

Company: _____ (Corporate Seal)

Signature: _____

Name and Title: _____

Address: _____

SURETY

Company: _____ (Corporate Seal)

Signature: _____

Name and Title: _____

Address: _____

Additions and Deletions Report for **AIA[®] Document A312[™] – 2010**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 14:45:59 on 03/30/2012.

There are no differences.

AIA[®] Document A312[™] – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:
Amount: \$
Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: \$
Modifications to this Bond: None See Section 16

CONTRACTOR AS PRINCIPAL
Company: *(Corporate Seal)*

SURETY
Company: *(Corporate Seal)*

Signature: _____
Name and Title:
(Any additional signatures appear on the last page of this Performance Bond.)

Signature: _____
Name and Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

init.

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

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

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

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

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

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

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

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

§ 14 Definitions

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

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

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

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

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

Init.

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

§ 16 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

Additions and Deletions Report for AIA[®] Document A312[™] – 2010

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 14:49:35 on 03/30/2012.

There are no differences.

**Capital School District
New Dover High School
Bid Package 'G'**

SECTION 00 62 16 – CERTIFICATE OF INSURANCE

In conjunction with Insurance Requirements AIA General Conditions, Article 11, the Contractor shall be bound by the following limits of liability insurance (for Contracts under this Bid Pac). The Contractor shall use the standard "ACCORD" for titled "Certificate of Insurance" in submitting his liability insurance limits. The required limits to be inserted in accordance with the sample "ACCORD" form in this section:

GENERAL NOTES

1. Other Insurance

1.1 Contractor shall carry any necessary insurance required to cover Owned and Rental equipment that may be necessary for them to use in the performance of the Work.

2. Contractor shall have the following additional items added to his required "ACCORD" form Certificate of Insurance:

1. Name and Address of Insured (Contractor).
2. Description of Operations/Locations.

3. Added Insured – Capital School District and EDiS Company

4. Certificate Holder – Capital School District

Contractors shall note that although not a part of AIA Document A201/CMA – 1992 Edition or A201 – 1992 Edition, these additional articles apply as noted to this Project.

A sample certificate is bound into the Project Manual immediately following this Document.

END OF SECTION

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY)
XX/XX/XX

PRODUCER
PRODUCER INSURANCE AGENCY
PO BOX
PRODUCER STREET ADDRESS
PRODUCER CITY, ST PROD ZIP

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE

INSURER D:

INSURER E:

SAMPLE SUBCONTRACTOR CERTIFICATE
(REQUIRED MINIMUM INSURANCE)

INSURER A: XXXXXX
INSURER B: XXXXXX
INSURER C: XXXXXX
INSURER D:
INSURER E:

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	DATE (MM/YY)	LIMITS	
	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR GENL AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC	XXXXXXXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	EACH OCCURRENCE	\$ 1,000,000
				FIRE DAMAGE (Any one fire)	\$ 300,000	
				MED EXP (Any one person)	\$ 10,000	
				PERSONAL & ADV INJURY	\$ 1,000,000	
				GENERAL AGGREGATE	\$ 2,000,000	
				PRODUCTS - COMP/OP AGG	\$ 2,000,000	
	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIREDAUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS	XXXXXXXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
				BODILY INJURY (Per person)	\$	
				BODILY INJURY (Per accident)	\$	
				PROPERTY DAMAGE (Per accident)	\$	
	GARAGE LIABILITY <input type="checkbox"/> ANY AUTO				AUTO ONLY - EA ACCIDENT	\$
				OTHER THAN: AUTO ONLY: EA ACC AGG	\$	
					\$	
	EXCESS LIABILITY <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE DEDUCTIBLE RETENTION \$	XXXXXXXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXX	EACH OCCURRENCE	\$ 5,000,000
				AGGREGATE	\$ 5,000,000	
					\$	
					\$	
					\$	
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	XXXXXXXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER	\$
				E.L. EACH ACCIDENT	\$ 500,000	
				E.L. DISEASE - EA EMPLOYEE	\$ 500,000	
				E.L. DISEASE - POLICY LIMIT	\$ 500,000	
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

Project: Capital School District, New Dover High School

Capital School District and EDiS Company shall be named as Additional Insured for both ongoing and completed operations. The endorsements providing the Additional Insured status for ongoing and completed operations must be attached to the Certificate of Insurance.

CERTIFICATE HOLDER ADDITIONAL INSURED; INSURER LETTER: _____ CANCELLATION

EDiS Company
110 South Poplar Street
Suite 400
Wilmington, DE 19801

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

SECTION 00 72 00 – GENERAL CONDITIONS

1. SUMMARY

- 1.1. The General Conditions for this Project is either the American Institute of Architects A201/CMA – 1992 Edition form for General Conditions of the Contract for Construction.
- 1.2 A copy of AIA General Conditions for this Project is bound into this Project Manual following this page.

END OF SECTION



AIA[®]

Document A201/CMa[™] – 1992

General Conditions of the Contract for Construction where the Construction Manager is NOT a Constructor

for the following PROJECT:

(Name and location or address):

New Dover High School
Preliminary Site Improvements
Dover, Delaware 19904

THE OWNER:

(Name and address):

Capital School District
945 Forest Road
Dover, Delaware 19904

THE ARCHITECT:

(Name and address):

ABHA
1621 N. Lincoln Street
Wilmington, Delaware 19806

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.

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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 Architect. 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. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Construction Manager and Contractor, (3) between the Architect and Construction Manager, (4) between the Owner and a Subcontractor or Sub-subcontractor or (5) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

§ 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.

§ 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 other Contractors and by the Owner's own forces including persons or entities under separate contracts not administered by the Construction Manager.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, 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, construction systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 THE PROJECT MANUAL

The Project Manual is the volume usually assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

§ 1.2 EXECUTION, CORRELATION AND INTENT

§ 1.2.1 The Contract Documents shall be signed by the Owner and Contractor as provided in the Agreement. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request.

§ 1.2.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 1.2.3 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 intended results.

§ 1.2.4 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.

§ 1.2.5 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.

§ 1.3 OWNERSHIP AND USE OF ARCHITECT'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

§ 1.3.1 The Drawings, Specifications and other documents prepared by the Architect are instruments of the Architect's service through which the Work to be executed by the Contractor is described. The Contractor may retain one contract record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect, and unless otherwise indicated the Architect shall be deemed the author of them and will retain all common law, statutory and other reserved rights, in addition to the copyright. All copies of them, 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 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 and Architect. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this license shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect. 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 copyright or other reserved rights.

§ 1.4 CAPITALIZATION

§ 1.4.1 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.

§ 1.5 INTERPRETATION

§ 1.5.1 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.

ARTICLE 2 OWNER

§ 2.1 DEFINITION

§ 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 term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner upon reasonable written request shall furnish to the Contractor in writing information which is necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein at the time of execution of the Agreement and, within five days after any change, information of such change in title, recorded or unrecorded.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 The Owner shall, at the request of the Contractor, prior to execution of the Agreement and promptly from time to time thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract.

[Note: Unless such reasonable evidence were furnished on request prior to the execution of the Agreement, the prospective contractor would not be required to execute the Agreement or to commence the Work.]

§ 2.2.2 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site.

§ 2.2.3 Except for permits and fees which are the responsibility of the Contractor under the Contract Documents, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Unless otherwise provided under the Contract Documents, the Owner, through the Construction Manager, shall secure and pay for the building permit.

§ 2.2.4 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in orderly progress of the Work.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, such copies of Drawings and Project Manuals as are reasonably necessary for execution of the Work.

§ 2.2.6 The Owner shall forward all communications to the Contractor through the Construction Manager and shall contemporaneously provide the same communications to the Architect.

§ 2.2.7 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Article 6 (Construction by Owner or by Other Contractors), Article 9 (Payments and Completion) and Article 11 (Insurance and Bonds).

§ 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, by written order signed personally or by an agent specifically so empowered by the Owner in writing, may order 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.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

§ 2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such seven-day period give the Contractor a second written notice to correct such deficiencies within a second seven-day period. If the Contractor within such second seven-day period after receipt of such second notice fails to commence and continue to correct any deficiencies, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the 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. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect, after consultation with the Construction Manager. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 DEFINITION

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

§ 3.1.2 The plural term "Contractors" refers to persons or entities who perform construction under Conditions of the Contract that are administered by the Construction Manager, and that are identical or substantially similar to these Conditions.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner pursuant to Section 2.2.2 and shall at once report to the Construction Manager and Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner, Construction Manager or Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor recognized such error, inconsistency or omission and knowingly failed to report it to the Construction Manager and Architect. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Construction Manager and Architect, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction.

§ 3.2.2 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the Construction Manager and Architect at once.

§ 3.2.3 The Contractor shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Section 3.12.

§ 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 this Contract, subject to overall coordination of the Construction Manager as provided in Sections 4.6.3 and 4.6.4.

§ 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 other persons performing portions of the Work under a contract with the Contractor.

§ 3.3.3 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 Construction Manager or Architect in their administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

§ 3.3.4 The Contractor shall inspect portions of the Project related to the Contractor's Work in order to determine that such portions are in proper condition to receive subsequent Work.

§ 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.

§ 3.4.2 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.

§ 3.5 WARRANTY

§ 3.5.1 The Contractor warrants to the Owner, Construction Manager and Architect 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 with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Construction Manager or Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES AND NOTICES

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner shall secure and pay for the building permit and the Contractor shall secure and pay for all other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

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

§ 3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Construction Manager, Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

§ 3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Construction Manager, Architect and Owner, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities against which the Contractor makes reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents:

- .1 materials and equipment under an allowance shall be selected promptly by the Owner to avoid delay in the Work;
- .2 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .3 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not in the allowances;
- .4 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.2 and (2) changes in Contractor's costs under Section 3.8.2.3.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULE

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information and the Construction Manager's approval a Contractor's Construction Schedule for the Work. Such schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project construction schedule to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict, delay in or interference with the Work of other Contractors or the construction or operations of the Owner's own forces.

§ 3.10.3 The Contractor shall prepare and keep current, for the Construction Manager's and Architect's approval, a schedule of submittals which is coordinated with the Contractor's Construction Schedule and allows the Construction Manager and Architect reasonable time to review submittals.

§ 3.10.4 The Contractor shall conform to the most recent schedules.

§ 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 changes and selections made during construction, and in addition approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Construction Manager and Architect and shall be delivered to the Construction Manager for submittal to the Owner upon completion of the Work.

§ 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 the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect is subject to the limitations of Section 4.6.12.

§ 3.12.5 The Contractor shall review, approve and submit to the Construction Manager, in accordance with the schedule and sequence approved by the Construction Manager, Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples and similar submittals with related documents submitted by other Contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action.

§ 3.12.6 The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Construction Manager and Architect. Such Work shall be in accordance with approved submittals.

§ 3.12.7 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.

§ 3.12.8 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Construction Manager's and Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Construction Manager and Architect in writing of such deviation at the time of submittal and the Construction Manager and Architect have given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Construction Manager's and Architect'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 Construction Manager and Architect on previous submittals.

§ 3.12.10 Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents.

§ 3.12.11 When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Construction Manager and Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

§ 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.

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 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's own forces or of other Contractors by cutting, patching, excavating or otherwise altering such construction. The Contractor shall not cut or otherwise alter such construction by other Contractors or by the Owner's own forces except with written consent of the Construction Manager, Owner and such other Contractors; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the other Contractors or the Owner the Contractor's consent to cutting or otherwise altering the Work.

§ 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.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Construction Manager may do so with the Owner's approval and the cost thereof shall be charged to the Contractor.

§ 3.16 ACCESS TO WORK

§ 3.16.1 The Contractor shall provide the Owner, Construction Manager and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES AND PATENTS

§ 3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of patent rights and shall hold the Owner, Construction Manager and 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 Contractor has reason to believe that the required design, process or product is an infringement of a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, 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, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by

negligent acts or omissions of the Contractor, 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 construed to negate, abridge or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 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 this Section 3.18 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.

§ 3.18.3 The obligations of the Contractor under this Section 3.18 shall not extend to the liability of the Construction Manager, Architect, their consultants, and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Construction Manager, Architect, their consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

§ 4.1 ARCHITECT

§ 4.1.1 The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

§ 4.2 CONSTRUCTION MANAGER

§ 4.2.1 The Construction Manager 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 "Construction Manager" means the Construction Manager or the Construction Manager's authorized representative.

§ 4.3 Duties, responsibilities and limitations of authority of the Construction Manager and Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Construction Manager, Architect and Contractor. Consent shall not be unreasonably withheld.

§ 4.4 In case of termination of employment of the Construction Manager or Architect, the Owner shall appoint a construction manager or architect against whom the Contractor makes no reasonable objection and whose status under the Contract Documents shall be that of the former construction manager or architect, respectively.

§ 4.5 Disputes arising under Sections 4.3 and 4.4 shall be subject to arbitration.

§ 4.6 ADMINISTRATION OF THE CONTRACT

§ 4.6.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents, and will be the Owner's representatives (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the correction period described in Section 12.2. The Construction Manager and Architect will advise and consult with the Owner and will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with other provisions of the Contract.

§ 4.6.2 The Construction Manager will determine in general that the Work is being performed in accordance with the requirements of the Contract Documents, will keep the Owner informed of the progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work.

§ 4.6.3 The Construction Manager will provide for coordination of the activities of other Contractors and of the Owner's own forces with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other Contractors and the Construction Manager and Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed

necessary after a joint review and mutual agreement. The construction schedules shall constitute the schedules to be used by the Contractor, other Contractors, the Construction Manager and the Owner until subsequently revised.

§ 4.6.4 The Construction Manager will schedule and coordinate the activities of the Contractors in accordance with the latest approved Project construction schedule.

§ 4.6.5 The Architect will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the completed Work and to determine in general if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check quality or quantity of the Work. On the basis of on-site observations as an architect, the Architect will keep the Owner informed of progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work.

§ 4.6.6 The Construction Manager, except to the extent required by Section 4.6.4, and Architect will not have control over or charge of and will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility as provided in Section 3.3, and neither will be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of or be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons performing portions of the Work.

§ 4.6.7 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall communicate through the Construction Manager, and shall contemporaneously provide the same communications to the Architect. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with other Contractors shall be through the Construction Manager and shall be contemporaneously provided to the Architect.

§ 4.6.8 The Construction Manager will review and certify all Applications for Payment by the Contractor, including final payment. The Construction Manager will assemble each of the Contractor's Applications for Payment with similar Applications from other Contractors into a Project Application and Project Certificate for Payment. After reviewing and certifying the amounts due the Contractors, the Construction Manager will submit the Project Application and Project Certificate for Payment, along with the applicable Contractors' Applications and Certificates for Payment, to the Architect.

§ 4.6.9 Based on the Architect's observations and evaluations of Contractors' Applications for Payment, and the certifications of the Construction Manager, the Architect will review and certify the amounts due the Contractors and will issue a Project Certificate for Payment.

§ 4.6.10 The Architect will have authority to reject Work which does not conform to the Contract Documents, and to require additional inspection or testing, in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed, but will take such action only after notifying the Construction Manager. Subject to review by the Architect, the Construction Manager will have the authority to reject Work which does not conform to the Contract Documents. Whenever the Construction Manager considers it necessary or advisable for implementation of the intent of the Contract Documents, the Construction Manager will have authority to require additional inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.6.18 through 4.6.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.6.10 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.6.11 The Construction Manager will receive from the Contractor and review and approve all Shop Drawings, Product Data and Samples, coordinate them with information received from other Contractors, and transmit to the

Architect those recommended for approval. The Construction Manager's actions will be taken with such reasonable promptness as to cause no delay in the Work of the Contractor or in the activities of other Contractors, the Owner, or the Architect.

§ 4.6.12 The Architect 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 and the design concept expressed in the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work of the Contractor or in the activities of the other Contractors, the Owner, or the Construction Manager, while allowing sufficient time in the Architect's professional judgment 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 Architect'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 Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.6.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.6.14 Following consultation with the Construction Manager, the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7 and will have authority to order minor changes in the Work as provided in Section 7.4.

§ 4.6.15 The Construction Manager will maintain at the site for the Owner one record copy of all Contracts, Drawings, Specifications, addenda, Change Orders and other Modifications, in good order and marked currently to record all changes and selections made during construction, and in addition approved Shop Drawings, Product Data, Samples and similar required submittals. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.6.16 The Construction Manager will assist the Architect in conducting inspections to determine the dates of Substantial Completion and final completion, and will receive and forward to the Architect written warranties and related documents required by the Contract and assembled by the Contractor. The Construction Manager will forward to the Architect a final Project Application and Project Certificate for Payment upon compliance with the requirements of the Contract Documents.

§ 4.6.17 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.6.18 The Architect will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of the Construction Manager, Owner or Contractor. The Architect's response to such requests will be made with reasonable promptness and within any time limits agreed upon. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Section 4.6, 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.

§ 4.6.19 Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith.

§ 4.6.20 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.7 CLAIMS AND DISPUTES

§ 4.7.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 4.7.2 Decision of Architect. Claims, including those alleging an error or omission by the Construction Manager or Architect, shall be referred initially to the Architect for action as provided in Section 4.8. A decision by the Architect, as provided in Section 4.8.4, shall be required as a condition precedent to arbitration or litigation of a Claim between the Contractor and Owner as to all such matters arising prior to the date final payment is due, regardless of (1) whether such matters relate to execution and progress of the Work or (2) the extent to which the Work has been completed. The decision by the Architect in response to a Claim shall not be a condition precedent to arbitration or litigation in the event (1) the position of Architect is vacant, (2) the Architect has not received evidence or has failed to render a decision within agreed time limits, (3) the Architect has failed to take action required under Section 4.8.4 within 30 days after the Claim is made, (4) 45 days have passed after the Claim has been referred to the Architect or (5) the Claim relates to a mechanic's lien.

§ 4.7.3 Time Limits on Claims. Claims by either party must be made within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.

§ 4.7.4 Continuing Contract Performance. Pending final resolution of a Claim including arbitration, unless otherwise agreed in writing the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 4.7.5 Waiver of Claims: Final Payment. 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.

§ 4.7.6 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 Architect 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 Architect 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 Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the Architect has given notice of the decision. If the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Section 4.8.

§ 4.7.7 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 10.3. If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with the procedure established herein.

§ 4.7.8 Claims for Additional Time.

§ 4.7.8.1 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.

§ 4.7.8.2 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 and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the scheduled construction.

§ 4.7.9 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, of any of the other party's employees or agents, or of others for whose acts such party is legally liable, 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 first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be filed as provided in Sections 4.7.7 or 4.7.8.

§ 4.8 RESOLUTION OF CLAIMS AND DISPUTES

§ 4.8.1 The Architect will review Claims and take one or more of the following preliminary actions within ten days of receipt of a Claim: (1) request additional supporting data from the claimant, (2) submit a schedule to the parties indicating when the Architect expects to take action, (3) reject the Claim in whole or in part, stating reasons for rejection, (4) recommend approval of the Claim by the other party or (5) suggest a compromise. The Architect may also, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim.

§ 4.8.2 If a Claim has been resolved, the Architect will prepare or obtain appropriate documentation.

§ 4.8.3 If a Claim has not been resolved, the party making the Claim shall, within ten days after the Architect's preliminary response, take one or more of the following actions: (1) submit additional supporting data requested by the Architect, (2) modify the initial Claim or (3) notify the Architect that the initial Claim stands.

§ 4.8.4 If a Claim has not been resolved after consideration of the foregoing and of further evidence presented by the parties or requested by the Architect, the Architect will notify the parties in writing that the Architect's decision will be made within seven days, which decision shall be final and binding on the parties but subject to arbitration. Upon expiration of such time period, the Architect will render to the parties the Architect's written decision relative to the Claim, including any change in the Contract Sum or Contract Time or both. If there is a surety and there appears to be a possibility of a Contractor's default, the Architect may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 4.9 ARBITRATION

§ 4.9.1 Controversies and Claims Subject to Arbitration. Any controversy or Claim arising out of or related to the Contract, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator or arbitrators may be entered in any court having jurisdiction thereof, except controversies or Claims relating to aesthetic effect and except those waived as provided for in Section 4.7.5. Such controversies or Claims upon which the Architect has given notice and rendered a decision as provided in Section 4.8.4 shall be subject to arbitration upon written demand of either party. Arbitration may be commenced when 45 days have passed after a Claim has been referred to the Architect as provided in Section 4.7 and no decision has been rendered.

§ 4.9.2 Rules and Notices for Arbitration. Claims between the Owner and Contractor not resolved under Section 4.8 shall, if subject to arbitration under Section 4.9.1, be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect, unless the parties mutually agree otherwise. Notice of demand for arbitration shall be filed in writing with the other party to the Agreement between the Owner and Contractor and with the American Arbitration Association, and copies shall be filed with the Construction Manager and Architect.

§ 4.9.3 Contract Performance During Arbitration. During arbitration proceedings, the Owner and Contractor shall comply with Section 4.7.4.

§ 4.9.4 When Arbitration May Be Demanded. Demand for arbitration of any Claim may not be made until the earlier of (1) the date on which the Architect has rendered a final written decision on the Claim, (2) the tenth day after the parties have presented evidence to the Architect or have been given reasonable opportunity to do so, if the Architect has not rendered a final written decision by that date, or (3) any of the five events described in Section 4.7.2.

§ 4.9.4.1 When a written decision of the Architect states that (1) the decision is final but subject to arbitration and (2) a demand for arbitration of a Claim covered by such decision must be made within 30 days after the date on which the party making the demand receives the final written decision, then failure to demand arbitration within said 30 days' period shall result in the Architect's decision becoming final and binding upon the Owner and Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence, but shall not supersede arbitration proceedings unless the decision is acceptable to all parties concerned.

§ 4.9.4.2 A demand for arbitration shall be made within the time limits specified in Sections 4.9.1 and 4.9.4 and Section 4.9.4.1 as applicable, and in other cases within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to Section 13.7.

§ 4.9.5 Limitation on Consolidation or Joinder. No arbitration arising out of or relating to the Contract Documents shall include, by consolidation or joinder or in any other manner, the Construction Manager, the Architect, or the Construction Manager's or Architect's employees or consultants, except by written consent containing specific reference to the Agreement and signed by the Construction Manager, Architect, Owner, Contractor and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the Owner, Contractor, other Contractors as described in Article 6 and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No persons or entities other than the Owner, Contractor or other Contractors as defined in Section 3.1.2 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a dispute not described therein or with a person or entity not named or described therein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 4.9.6 Claims and Timely Assertion of Claims. A party who files a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded. When a party fails to include a Claim through oversight, inadvertence or excusable neglect, or when a Claim has matured or been acquired subsequently, the arbitrator or arbitrators may permit amendment.

§ 4.9.7 Judgment on Final Award. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Contractors or subcontractors of other Contractors.

§ 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 Construction Manager for review by the Owner, Construction Manager and Architect the names of persons or entities (including those who are to furnish

materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Construction Manager will promptly reply to the Contractor in writing stating whether or not the Owner, Construction Manager or Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Construction Manager 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, Construction Manager 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, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. The Contract Sum shall be increased or decreased by the difference in cost occasioned by such change and an appropriate Change Order shall be issued. However, no increase in the Contract Sum 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, Construction Manager or Architect makes reasonable objection to such change.

§ 5.3 SUBCONTRACTUAL RELATIONS

§ 5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect 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 shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

§ 5.4.2 If the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY OTHER CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION WITH OWN FORCES AND TO AWARD OTHER CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, which include persons or entities under separate contracts not administered by the Construction Manager. The Owner further reserves the right to award other 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. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided elsewhere in the Contract Documents.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces including persons or entities under separate contracts not administered by the Construction Manager, the Owner shall provide for coordination of such forces with the Work of the Contractor, who shall cooperate with them.

§ 6.1.3 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 this Article 6 and in Articles 3, 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner's own forces, Construction Manager and other 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's own forces or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Construction Manager and Architect 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 own forces or other Contractors' 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 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible therefor.

§ 6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed construction or partially completed construction or to property of the Owner or other Contractors as provided in Section 10.2.5.

§ 6.2.5 Claims and other disputes and matters in question between the Contractor and other Contractors shall be subject to the provisions of Section 4.7 provided the other Contractors have reciprocal obligations.

§ 6.2.6 The Owner and other Contractors 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, other 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 as described in Section 3.15, the Owner may clean up and allocate the cost among those responsible as the Construction Manager, in consultation with the Architect, determines to be just.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 CHANGES

§ 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, Construction Manager, Architect and Contractor; a Construction Change Directive requires agreement by the Owner, Construction Manager and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.1.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive 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.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Construction Manager and signed by the Owner, Construction Manager, Architect and Contractor, stating their agreement upon all of the following:

- .1 a change in the Work;
- .2 the amount of the adjustment in the Contract Sum, if any; and
- .3 the extent of the adjustment in the Contract Time, if any.

§ 7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Section 7.3.3.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner, Construction Manager and Architect, directing a change in the Work and stating a proposed basis for 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 be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 as provided in Section 7.3.6.

§ 7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager and Architect 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 Construction Manager on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.6 shall be limited to the following:

- .1 costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers compensation insurance;
- .2 costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

- 4 costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- 5 additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.7 Pending final determination of cost to the Owner, amounts not in dispute may be included in Applications for Payment. 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 Construction Manager. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.8 If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be referred to the Construction Manager for determination.

§ 7.3.9 When the Owner and Contractor agree with the determination made by the Construction Manager concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately issued through the Construction Manager and shall be recorded by preparation and execution of an appropriate Change Order.

§ 7.4 MINOR CHANGES IN THE WORK

§ 7.4.1 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order issued through the Construction Manager and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

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. The date shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect 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. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by 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 to permit the timely filing of mortgages, mechanic's liens and other security interests.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in progress of the Work by an act or neglect of the Owner's own forces, Construction Manager, Architect, any of the other Contractors or an employee of any of them, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner pending arbitration, or by other causes which

the Architect, based on the recommendation of the Construction Manager, determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Section 4.7.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

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.

§ 9.2 SCHEDULE OF VALUES

§ 9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect, through the Construction Manager, a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Construction Manager and Architect may require. This schedule, unless objected to by the Construction Manager or Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least fifteen days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment for Work 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, Construction Manager or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for elsewhere in the Contract Documents.

§ 9.3.1.1 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 of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and 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 materials and equipment or otherwise protect the Owner's interest, and shall include applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 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.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Construction Manager will assemble a Project Application for Payment by combining the Contractor's applications with similar applications for progress payments from other Contractors and, after certifying the amounts due on such applications, forward them to the Architect within seven days.

§ 9.4.2 Within seven days after the Architect's receipt of the Project Application for Payment, the Construction Manager and Architect will either issue to the Owner a Project Certificate for Payment, with a copy to the Contractor, for such amount as the Construction Manager and Architect determine is properly due, or notify the Contractor and Owner in writing of the Construction Manager's and Architect's reasons for withholding

certification in whole or in part as provided in Section 9.5.1. Such notification will be forwarded to the Contractor by the Construction Manager.

§ 9.4.3 The issuance of a separate Certificate for Payment or a Project Certificate for Payment will constitute representations made separately by the Construction Manager and Architect to the Owner, based on their individual observations at the site and the data comprising the Application for Payment submitted by the Contractor, that the Work has progressed to the point indicated and that, to the best of the Construction Manager's and Architect's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the Construction Manager or Architect. The issuance of a separate Certificate for Payment or a Project Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a separate Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed the Contractor's construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Construction Manager or Architect may decide not to certify payment and may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager or Architect will notify the Contractor and Owner as provided in Section 9.4.2. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Construction Manager and Architect will promptly issue a Certificate for Payment for the amount for which the Construction Manager and Architect are able to make such representations to the Owner. The Construction Manager or Architect may also decide not to certify payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss because of:

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or another contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
or
- .7 persistent failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Construction Manager and Architect have issued a Project Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect.

§ 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 similar manner.

§ 9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager and Architect on account of portions of the Work done by such Subcontractor.

§ 9.6.4 Neither the Owner, Construction Manager nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, 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.

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 If, through no fault of the Contractor, 1) the Construction Manager and Architect do not issue a Project Certificate for Payment within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment or 2) the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Construction Manager and Architect or awarded by arbitration, then the Contractor may, upon seven additional days' written notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, which shall be accomplished as provided in Article 7.

§ 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 so the Owner can occupy or utilize the Work for its intended use.

§ 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 and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. 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. Upon receipt of the list, the Architect, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. The Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Architect 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. 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.

§ 9.8.3 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Construction Manager and Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.11 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments,

retainage if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor and Construction Manager shall jointly prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect after consultation with the Construction Manager.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Construction Manager, Contractor and Architect 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 completion of the Work, the Contractor shall forward to the Construction Manager a written notice that the Work is ready for final inspection and acceptance and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager will forward the notice and Application to the Architect who will promptly make such inspection. When the Architect, based on the recommendation of the Construction Manager, finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their observations 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 said final Certificate is due and payable. The Construction Manager's and 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.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 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 Construction Manager and Architect so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager and 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 through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims. The making of final payment shall constitute a waiver of Claims by the Owner as provided in Section 4.4.5.

§ 9.10.4 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. Such waivers shall be in addition to the waiver described in Section 4.7.5.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors.

§ 10.1.2 In the event the Contractor encounters on the site material reasonably believed to be asbestos or polychlorinated biphenyl (PCB) which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner, Construction Manager and Architect in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless, by written agreement of the Owner and Contractor, or in accordance with final determination by the Architect on which arbitration has not been demanded, or by arbitration under Article 4.

§ 10.1.3 The Contractor shall not be required pursuant to Article 7 to perform without consent any Work relating to asbestos or polychlorinated biphenyl (PCB).

§ 10.1.4 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Construction Manager, Architect, their 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 in the affected area if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Owner, anyone directly or indirectly employed by the Owner or anyone for whose acts the Owner 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 construed to negate, abridge or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 10.1.4.

§ 10.1.5 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner, Construction Manager and Architect in writing. The Owner, Contractor, Construction Manager and Architect shall then proceed in the same manner described in Section 10.1.2.

§ 10.1.6 The Owner shall be responsible for obtaining the services of a licensed laboratory to verify a presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

- .1 employees on the Work and other persons who may be affected thereby;

- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors;
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and
- .4 construction or operations by the Owner or other Contractors.

§ 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.

§ 10.2.4 When use for 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.

§ 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, 10.2.1.3 and 10.2.1.4 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, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner, Construction Manager and Architect.

§ 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.

§ 10.3 EMERGENCIES

§ 10.3.1 In an emergency affecting safety or 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 4.7 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 claims under workers compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;
- .2 claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (2) by another person;

- .5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle; and
- .7 claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be submitted to the Construction Manager for transmittal to the Owner with a copy to the Architect prior to commencement of the Work. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Section 9.10.2. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.2 OWNER'S LIABILITY INSURANCE

§ 11.2.1 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance. Optionally, the Owner may purchase and maintain other insurance for self-protection against claims which may arise from operations under the Contract. The Contractor shall not be responsible for purchasing and maintaining this optional Owner's liability insurance unless specifically required by the Contract Documents.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance in the amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is earlier. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work.

§ 11.3.1.1 Property insurance shall be on an "all-risk" policy form and shall insure against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, falsework, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's services and expenses required as a result of such insured loss. Coverage for other perils shall not be required unless otherwise provided in the Contract Documents.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires minimum deductibles and such deductibles are identified in the Contract Documents, the Contractor shall pay costs not covered because of such deductibles. If the Owner or insurer increases the required minimum deductibles above the amounts so identified or if the Owner elects to purchase this

insurance with voluntary deductible amounts, the Owner shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles.

§ 11.3.1.4 Unless otherwise provided in the Contract Documents, this property insurance shall cover portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also portions of the Work in transit.

§ 11.3.1.5 The insurance required by this Section 11.3 is not intended to cover machinery, tools or equipment owned or rented by the Contractor which are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage for owned or rented machinery, tools or equipment which shall be subject to the provisions of Section 11.3.7.

§ 11.3.2 Boiler and Machinery Insurance. The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Construction Manager, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or for other special hazards be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, adjoining or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other perils covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 Waivers of Subrogation. The Owner and Contractor waive all rights against each other and against the Construction Manager, Architect, Owner's other Contractors and own forces described in Article 6, if any, and the subcontractors, sub-subcontractors, consultants, agents and employees of any of them, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as the Owner and Contractor may have to the proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, Owner's separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of

insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with an arbitration award in which case the procedure shall be as provided in Section 4.9. If after such loss no other special agreement is made, replacement of damaged property shall be covered by appropriate Change Order.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection be made, arbitrators shall be chosen as provided in Section 4.9. The Owner as fiduciary shall, in that case, make settlement with insurers in accordance with directions of such arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

§ 11.3.11 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

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 Construction Manager's or Architect's request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by either, be uncovered for their observation 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 Construction Manager or Architect has not specifically requested to observe prior to its being covered, the Construction Manager or Architect 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 charged to the Owner. If such Work is not in accordance with the Contract Documents, the Contractor shall pay such costs unless the condition was caused by the Owner or one of the other Contractors in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 The Contractor shall promptly correct Work rejected by the Construction Manager or Architect or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear costs of correcting such rejected Work, including additional testing and inspections and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby.

§ 12.2.2 If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. This period of one year 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. This obligation under this Section 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

§ 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 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 2.4. If the Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from the Architect issued through the Construction Manager, the Owner may remove it and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within ten days after written notice, the Owner may upon ten additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Construction Manager's and Architect's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

§ 12.2.5 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or other Contractors caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

§ 12.2.6 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 time period of one year as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

§ 12.3.1 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

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.

§ 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. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.3 WRITTEN NOTICE

§ 13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder 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, Construction Manager, 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 thereunder, except as may be specifically agreed in writing.

§ 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 Construction Manager and Architect timely notice of when and where tests and inspections are to be made so the Construction Manager and Architect may observe 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 Construction Manager, 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 Construction Manager and 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 Construction Manager and Architect of when and where tests and inspections are to be made so the Construction Manager and Architect may observe such procedures. The Owner shall bear such costs except as provided in Section 13.5.3.

§ 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, the Contractor shall bear all costs made necessary by such failure including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses.

§ 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 Construction Manager for transmittal to the Architect.

§ 13.5.5 If the Construction Manager or Architect is to observe tests, inspections or approvals required by the Contract Documents, the Construction Manager or 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 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

§ 13.7.1 As between the Owner and Contractor:

- .1 Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;
- .2 Between Substantial Completion and Final Certificate for Payment. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and
- .3 After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to

run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contract may terminate the Contract if the Work is stopped for a period of 30 days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor, for any of the following reasons:

- .1 issuance of an order of a court or other public authority having jurisdiction;
- .2 an act of government, such as a declaration of national emergency, making material unavailable;
- .3 because the Construction Manager or Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.2, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents;
- .4 if repeated suspensions, delays or interruptions by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less; or
- .5 the Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 If one of the above reasons exists, the Contractor may, upon seven additional days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit and damages.

§ 14.1.3 If the Work is stopped for a period of 60 days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has persistently failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.2.

§ 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; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, after consultation with the Construction Manager, and upon certification by the Architect that sufficient cause exists to justify such action, 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.

§ 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.

§ 14.2.4 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 Contractor. If such costs 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, upon application, be certified by the Architect after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

§ 14.3 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 An adjustment shall be made for increases in the cost of performance of the Contract, including profit on the increased cost of performance, caused by suspension, delay or interruption. No adjustment shall be made to the extent:

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.3.3 Adjustments made in the cost of performance may have a mutually agreed fixed or percentage fee.

SECTION 007300 - SUPPLEMENTARY CONDITIONS

1. GENERAL CONDITIONS

1.1. The General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, AIA Document A201/CMa - 1992 Edition, Articles 1 through 14 inclusive, is a part of this contract and is bound herewith.

1.2. References to Articles herein are to Articles in A201/CMa – 1992 Edition.

2. SUPPLEMENTARY CONDITIONS

2.1. The following provisions modify, change, delete from or add to AIA Document A201/CMa - 1992 Edition. Where any article of the General Conditions is modified or any paragraph, subparagraph or clause thereof is modified or deleted by these provisions, the unaltered provisions of that article, paragraph, sub-paragraph or clause shall remain in effect.

3. REFERENCE TO DIVISION 1 - GENERAL REQUIREMENTS

3.1. Certain provisions of Division 1 GENERAL REQUIREMENTS supplement the administrative and work-related provisions of the GENERAL CONDITIONS.

3.2. Articles affected are cross referenced in the various Sections of Division 1.

3.3. ARTICLE 1 - GENERAL PROVISIONS

A. Paragraph 1.1 - Basic Definitions

Add the following paragraph 1.1.1:

“The Contract Documents also include Advertisement for Bid, Instructions to Bidder, sample forms, the Bid Form, the Contractor’s completed Bid and the Award Letter.”

Add the following subparagraph:

1.1.8 Terms and Definitions

The following definitions apply to the terms listed below as used on the Drawings and in the Project Manual:

Provide: Furnish and Install

Approved: Approved by Architect or authority enforcing standards

Described: Refer to Project Manual

Specified: Refer to Project Manual

Shown: Refer to Drawings

Add the following subparagraph:

1.3.2 The Contractor will be furnished free of charge up to five (5) sets of the Drawings and Project Manual. Additional sets will be furnished at the cost of reproduction, postage, and handling.

3.4 ARTICLE 2 – OWNER

A. To Subparagraph 2.2.3 – Add the following sentence:

“The Contractor, at their expense shall bear the costs to accurately identify the location of all underground utilities in the area of their excavation and shall bear all costs for any repairs required, out of failure to accurately identify said utilities.”

B. Delete Subparagraph 2.2.5 in its entirety and substitute the following:

2.2.5 The Contractor shall be furnished free of charge up to two (2) sets of the Drawings and Project Manuals. As well as an electronic version for their use.

3.5 ARTICLE 3 – CONTRACTOR

A. Paragraph 3.1 - Definition

Sub-paragraph 3.1.1: Add the following sentences:

“This definition applies to each Contractor having an agreement with the Owner.”

“The duties and obligations of the Contract apply to this Contractor (as defined herein) regardless of similar or identical duties or obligations of other Prime Contracts related to the Project. Therefore, even though other Prime Contractors may have similar, identical or overlapping duties and obligations, each and every duty and obligation set forth in this Contract is enforceable against this Contractor.”

B. Amend Paragraph 3.2.2 to state the any errors, inconsistencies or omissions discovered shall be reported to the Architect and Owner immediately.

- C. Delete the third sentence in Paragraph 3.2.3.
- D. Add the following Paragraphs:
- 3.3.2.1 The Contractor shall immediately remove from the Work, whenever requested to do so by the Owner, any person who is considered by the Owner or Architect to be incompetent or disposed to be so disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or Architect.
- E. Paragraph 3.4 - Labor and Materials:
- Add the following Paragraphs:
- 3.4.3 The Contractor must provide suitable storage facilities at the Site for the proper protection and safe storage of their materials. Consult the Owner and the Architect before storing any materials.
- 3.4.4 When any room is used as a shop, storeroom, office, etc., by the Contractor or Subcontractor(s) during the construction of the Work, the Contractor making use of these areas will be held responsible for any repairs, patching or cleaning arising from such use.
- 3.4.5 Refer to Division 1 for detailed requirements concerning Temporary Facilities and Equipment.
- 3.4.6 Before starting the Work, each Contractor shall carefully examine all preparatory Work that has been executed to receive their Work. Check carefully, by whatever means are required, to insure that its Work and adjacent, related Work, will finish to proper contours, planes and levels. Promptly notify the General Contractor/Construction Manger of any defects or imperfections in preparatory Work which will in any way affect satisfactory completion of its Work. Absence of such notification will be construed as an acceptance of preparatory Work and later claims of defects or requests for adjustment of the Contract Sum will be denied.
- 3.4.7 Under no circumstances shall the Contractor's Work proceed prior to preparatory Work having been completely cured, dried and/or otherwise made satisfactory to receive this Work. Responsibility for timely installation of all materials

rests solely with the Contractor responsible for the Work, who shall maintain coordination at all times.

F. Paragraph 3.5 - Warranty:

Add the following Paragraphs:

3.5.2 The Contractor will guarantee all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for one year after Acceptance by the Owner, and will maintain all items in perfect condition during the period of guarantee.

3.5.3 Defects appearing during the period of guarantee will be made good by the Contractor, at his sole expense, upon demand of the Owner, it being required that all work will be in perfect condition when the period of guarantee will have elapsed.

3.5.4 In addition to the General Guarantee there are other guarantees required for certain items for different periods of time than the one year above, and are particularly so stated in the part of the specifications referring to same. The said guarantees will commence at the same time as the General Guarantee.

3.5.5 If the Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the Owner will have the right to replace, repair or otherwise remedy the failure, defect or damage at the Contractor's expense.

G. Paragraph 3.7 - Permits, Fees and Notices

Add the following subparagraphs:

3.7.5 Where the local law at the site of the building requires a Certificate of Occupancy, the Construction Manager shall obtain and pay for this Certificate through the Owner and deliver it to the Owner.

3.7.6 The general building permit for all components of the entire project will be obtained from the applicable authority and paid for by the Owner through the Construction Manager.

H. Paragraph 3.12 - Shop Drawings, Product Data and Samples

Add the following subparagraph:

3.12.12 Refer to Section 013300, SUBMITTALS, for detailed requirements.

I. 3.15 - Cleaning Up

Add the following subparagraph:

3.15.3 Refer to Section 011100, SUMMARY OF WORK, for detailed requirements.

3.6 ARTICLE 4 - ADMINISTRATION OF THE CONTRACT

A. Paragraph 4.1 - Architect

Add the following Subparagraph:

4.1.2 The Architect will have no full-time project representative on this project.

Delete Paragraph 4.5 in its entirety and replace with the following:

4.5 The Architect will approve or reject Claims by Written decision, which shall state the reasons therefore and shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be subject to mediation and other remedies at law as herein set forth.

3.7 ARTICLE 5 - SUBCONTRACTORS

A. Paragraph 5.2 - Awards of Subcontracts and Other Contracts for Portions of the Work.

Delete subparagraph 5.2.3 in its entirety and replace with the following:

5.2.3 If the Owner or Construction Manager has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Construction Manager has no reasonable objection, subject to the statutory requirements of 29 Delaware Code 6962(d)(10)b.3,4.

Add the following subparagraph:

5.2.5 Delaware State law provisions concerning naming and use of Subcontractors supersede any foregoing provisions of

Paragraph 5.2 where such provisions are in conflict with Delaware State Law. Refer to provisions in Section 002113 INSTRUCTIONS TO BIDDERS.

3.8 ARTICLE 6 - CONSTRUCTION BY OWNER OR BY OTHER CONTRACTORS

A. Paragraph 6.1 - Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

Add the following subparagraph:

6.1.4 Refer to Section 011100, SUMMARY OF WORK, for detailed requirements.

B. Paragraph 6.2 - Mutual Responsibility

Delete Subparagraph 6.2.5 in its entirety and substitute the following:

6.2.5 Should the Contractor, any Subcontractor, or Sub-subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts any of them may be liable, cause damage to the work of property of any separate Contractor on the project, or should such separate Contractor or interested party sustain loss or damaged due to acts or omissions on the part of the Contractor any Subcontractor or Sub-subcontractor, any one directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the Contractor shall, upon due notice settle with such other Contractors by agreement or arbitration, if he will so settle. Contractor shall use all reasonable means to resolve the matter quickly. If such separate Contractor sues the Owner, Construction Manager, or Architect, or initiates an arbitration proceeding on account of any damages alleged to have been so sustained, the Owner, Construction Manager, or Architect shall notify the Contractor, who shall indemnify them and defend such proceedings at the Owner, Construction Manager, or Architect's expense. If any judgment against the Owner, Construction Manager, or Architect arises therefrom, the Contractor shall pay or satisfy it, together with all fees, costs, expenses, disbursements, or liabilities related thereto. The Contractor shall also reimburse the Owner, Construction Manager, or Architect for all attorney's fees and court or arbitration costs which the Owner, Construction Manager, or Architect has incurred.

3.9 ARTICLE 7 - CHANGES IN THE WORK

A. Paragraph 7.2 - Change Orders

Add the following subparagraphs:

7.2.3 See Section 012600, CHANGE ORDER PROCEDURES, for detailed requirements.

7.2.4 In the event that work is performed under the provisions of paragraph 7.33, the Owner will reimburse the Contractor for all costs directly incurred in the performance of the Work, plus overhead and profit as follows: Costs shall include the cost of materials including sales tax and cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits required by agreement or custom; bond premiums, rental value of power tools, equipment and machinery. Overhead shall include the following: supervision, superintendent, wages of time keepers, watchmen and clerks, hand tools, incidentals, general office expense, and all other expenses not included in "cost". All such overhead shall be directly attributable to the change. As applied to Change Orders, overhead and profit shall be as follows:

1. For extra work performed by the Contractor with his own forces, 10% for overhead and 5% for profit.
2. For work done by a subcontractor, 10% for overhead and 5% for profit to which the Contractor may add an additional 7.5% for his overhead and profit combined.
3. For work deleted by a Change Order or where reductions in costs are involved, no item for overhead or profit shall be included in the computation. Change Orders shall have additions and deductions figured separately without overhead and profit added. The smaller amount shall then be deducted from the larger to determine the net value of the change. If the net results in an addition to the Contract Sum, the above overhead and profit items shall be added to the net increase only.

3.10 ARTICLE 8 - TIME

A. Paragraph 8.2 - Progress and Completion

Delete subparagraph 8.2.3 in its entirety and substitute the following:

8.2.3 Refer to Section 011100 SUMMARY OF WORK and Section 013216, SCHEDULING, for detailed requirements. Work

shall commence immediately upon the Contractors receipt of a letter of intent from the Construction Manager.

8.2.4 The Contractor guarantees and warrants that there will be sufficient tradesmen on the job each day to ensure that there will be no interruption of work. If the Construction Manager in his sole discretion decides that the work and the progress of the job has been impeded because of the Contractor's inability to supply tradesmen for the job, the Construction Manager may terminate the contract with forty-eight (48) hours notice.

8.2.5 If the Work falls behind Progress Schedule as submitted by the Contractor, the Contractor shall employ additional labor and/or equipment necessary to bring the Work into compliance with the Progress Schedule at no additional cost to the Owner.

B. Paragraph 8.3 – Delays and Extensions of Time

Add the following subparagraph:

8.3.2.1 The Contractor shall update the status of the suspension, delay or interruption of the Work with each Application for Payment. (The Contractor shall report the termination of such cause immediately upon the termination thereof.) Failure to comply with this procedure shall constitute a waiver for any claim for adjustment of time or price based upon said cause.

Delete Paragraph 8.3.3 in its entirety and replace with the following:

8.3.3 Except in the case of a suspension of the Work directed by the Owner, an extension of time under the provisions of Paragraph 8.3.1 shall be the Contractor's sole remedy in the progress of the Work and there shall be no payment or compensation to the Contractor for any expense or damage resulting from the delay.

Add the following Paragraph:

8.3.4 By permitting the Contractor to work after the expired time for completion of the project, the Owner does not waive its rights under the Contract.

3.11 ARTICLE 9 - PAYMENTS AND COMPLETION

A. Paragraph 9.2 - Schedule of Values

Add the following sentence to subparagraph 9.2.1:

"Refer to Section 013300, SUBMITTALS, for submittal requirements."

Add the following subparagraphs:

9.2.2 The Schedule of Values shall be submitted using AIA Document G702, Continuation Sheet to G703.

9.2.3 The Schedule of Values is to include a line item for Project Closeout Document Submittal. The value of this item is to be no less than 3.5% of the initial contract amount.

B. Paragraph 9.3 - Applications for Payment

Add the following Subparagraphs:

9.3.4 Until Closeout Documents have been received and outstanding items completed, the Owner will pay 95% (ninety-five percent) of the amount due the Contractor on account of progress payments.

C. Paragraph 9.5 – Decisions to Withhold Certification

Add the following to 9.5.1:

failure to provide a current Progress Schedule;
a lien or attachment is filed;
failure to comply with mandatory requirements for maintaining Record Documents.

D. Paragraph 9.6 - Progress Payments

Delete subparagraph 9.6.1 in its entirety and replace with the following:

9.6.1 After the Architect has approved and issued a Certificate for Payment, payment shall be made by the Owner within 30 days after Owner's receipt of the Certificate of Payment.

3.12 Article 10 – Protection of Persons and Property

A. 10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Paragraphs:

10.1.2 Contractor shall develop a safety program in accordance with the Occupational Safety and Health Act of 1970. A copy of said plan shall be furnished to the Owner and Architect prior to the commencement of that Contractor's Work.

10.1.3 Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full time bases. If deemed necessary by the Owner or Architect, Contractor Safety meetings will be scheduled. The attendance of all Safety Representatives will be required. Minutes will be recorded of said meeting by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

3.13 ARTICLE 11 - INSURANCE

A. Paragraph 11.1.: Contractor's Liability Insurance

Subparagraph 11.1.1: Make the following change:

11.1.1 In the first line following the word "maintain" insert the words "in a company or companies licensed to do business in the state of Delaware....".

B. Subparagraph 11.1.2: Delete entirely and insert the following:

11.1.2 "The insurance required by subparagraph 11.1.1 shall be written for not less than the following or as required by law, whichever is greater.

In conjunction with Insurance Requirements AIA General Conditions, Article 11, the Contractor shall be bound by the following limits of liability insurance (for contracts under this bid pac). The Contractor shall use the standard "ACCORD" form titled "Certificate of Insurance" in submitting his liability insurance limits. The required limits to be inserted in the "ACCORD" form are as follows:

The Contractor shall purchase and maintain at all times throughout the term of this Agreement without interruption and, at the least, from the date of the commencement of the Work until the date of final payment or the date insurance coverage is required to be maintained after final payment to the Contractor under this Agreement, whichever is later, the following insurance coverages (with the specified limits of liability) and shall provide to the Construction Manager the complete policies for such insurance coverages upon the request of the Construction Manager:

- 11.1.2.1 Commercial General Liability (“CGL”) coverage with limits of not less than \$1,000,000 each occurrence and \$2,000,000 in the "annual aggregate".
 - 11.1.2.1.1 If the CGL coverage contains a “General Aggregate Limit”, such General Aggregate Limit shall apply separately to each project of the Contractor, specifically including this Project.
 - 11.1.2.1.2 CGL coverage shall be written on ISO Occurrence Form CG 00 011093, or a substitute form providing equivalent coverage and shall cover liability arising from premises, operations, independent contractors, product-completed operations and personal and advertising injury.
 - 11.1.2.1.3 EDiS Company, Owner and all other parties required by EDiS Company shall be included as additional insureds on the CGL using Additional Insured Endorsements that provide coverage for both ongoing and completed operations. The insurance for the additional insureds shall be as broad as the coverage provided for the named insured Contractor. The CGL coverage shall apply as Primary and non-contributory insurance before any other insurance or self-insurance, including any deductible, maintained by, or provided to, any additional insured other than the other insurances coverages purchased and maintained by the Contractor hereunder.
 - 11.1.2.1.4 Contractor shall maintain CGL coverage for itself and all additional insureds for the duration of the Project and maintain Completed Operations coverage for itself and each additional insured for at least three (3) years after completion of the Work, using Additional Insured Endorsements that provide Completed Operations Coverage.
- 11.1.2.2. Business Automobile Liability (“BAL”) coverage with combined single limits of at least \$1,000,000 (per occurrence).

- 11.1.2.2.1 BAL coverage must include coverage for liability arising out of all owned, leased, hired and non-owned automobiles.
- 11.1.2.2.2 BAL coverage shall be written on an occurrence basis.
- 11.1.2.2.3 Construction Manager, Owner and all other parties required by the Construction Manager shall be included as additional insureds on the BAL coverage. The insurance for the additional insureds shall be as broad as the coverage provided for the named insured Contractor. The BAL coverage shall apply as Primary and non-contributory insurance before any other insurance or self-insurance, including any deductible, maintained by, or provided to, any additional insured other than the other insurances coverages purchased and maintained by the Contractor hereunder.
- 11.1.2.3. Commercial Umbrella ("CU") coverage with limits of at least \$5,000,000.
 - 11.1.2.3.1 CU coverage shall be written on an occurrence basis.
 - 11.1.2.3.2 Construction Manager, Owner and all other parties required by the Construction Manager shall be included as additional insureds on the CU coverage for both ongoing and Completed Operations. The insurance for the additional insureds shall be as broad as the coverage provided for the named insured Contractor. The CU coverage shall apply as Primary and non-contributory insurance before any other insurance or self-insurance, including any deductible, maintained by, or provided to, any additional insured other than the other insurances coverages purchased and maintained by the Contractor hereunder.
- 11.1.2.4 Workers' Compensation shall be maintained to protect against claims under the workers' compensation act with limits of at least \$500,000 for each accident. Employers'

Liability coverage will also be maintained with limits of at least \$500,000 for each accident for bodily injury including death and disease.

11.1.2.4.1 WCEL coverage shall be written on an occurrence basis.

11.1.2.4.2 Where applicable and/or as required by the construction manager, the U.S. Longshoremen and Harborworkers' Compensation Act endorsement shall be included as part of the WCEL coverage and attached to the policy for WCEL coverage.

11.1.2.4.3 Where applicable and/or as required by the Construction Manager, the Maritime Coverage Endorsement shall be included as part of the WCEL coverage and attached to the policy for WCEL coverage.

11.1.2.5 The Contractor shall provide property insurance necessary for the protection against loss of owned, rented or borrowed capital equipment and tools, including tools owned by employees, and any tools, equipment staging towers and forms owned, rented or borrowed by the Subcontractor. The property insurance shall include a Waiver of Subrogation in favor of all parties required to be named as Additional Insureds under the Contract Documents. Contractor shall ensure that any subcontractor employed by him similarly carries sufficient insurance to protect that subcontractor's property.

11.1.2.6 Contractor waives all rights against the Construction Manager, Owner and all their agents, officers, directors and employees for recovery of damages to the extent those damages are covered by any of the insurance coverages purchased and maintained by the Contractor.

11.1.2.7 Contractor shall provide the Construction Manager with appropriate certificates of insurance coverages evidencing that the insurance coverages required herein are valid and in full force and effect at least thirty (30) days before the Contractor performs any Work and before the Contractor or any of its agents, subcontractors or employees enters upon the job site. Each such certificate of insurance and the actual insurance policy for each insurance coverage required herein shall contain a provision that the coverage and protection afforded under the policy will not be canceled or

- modified or allowed to expire without at least thirty (30) days' prior written notice to the Construction Manager.
- 11.1.2.8 Each policy of insurance coverage purchased and maintained by the Contractor herein shall be so purchased and maintained from or by an insurance company properly and fully authorized and licensed to do business and to issue policies of insurance in the state in which the Project is located.
- 11.1.2.9 Each policy of insurance coverage purchased and maintained by the Contractor herein shall provide that the insurer shall defend any suit or action against the Construction Manager, Owner and/or their agents, officers, directors and employees and hold them harmless, even if such suit or action is frivolous or fraudulent. Such policy also shall provide the Construction Manager and Owner the right to engage their/its own attorney(s) for the purpose of defending any legal action against the Construction Manager, Owner and their agents, officers, directors and employees, and that the Contractor shall indemnify and hold harmless the Construction Manager, Owner, and their agents, officers, directors and employees, for costs and expenses, including attorney's fees, arising out of or incurred in defending such suit or action.
- 11.1.2.10 The purchase, maintenance or issuance of insurance coverage of any type by the Contractor or the Construction Manager or Owner as required herein or otherwise, shall not be deemed or construed to release, limit, waive or discharge the Contractor from any or all of the obligations and risks imposed by the Agreement upon the Contractor. Neither shall any forbearance nor omission by the Construction Manager to require proof of insurance coverages or certificates of insurance or to obtain or review any policies of insurance coverage from the Contractor before permitting the Contractor to proceed or continue with the Work be deemed a waiver of the Construction Manager's rights or the Contractor's obligations regarding the provision of insurance coverage under this Agreement.
- 11.1.2.11 Waiver of Subrogation. Subcontractor hereby waives any and all rights of recovery against the Construction Manager, Owner and their respective officers, members, agents, employees, and insurance companies occurring on or arising out of Contractor's Work to the extent such loss or damage is covered by proceeds received from insurance required under this Agreement to be carried by the Contractor.

11.1.2.12 Contractor hereby certifies that it has furnished to its insurance provider(s) a copy or copies of the foregoing insurance requirements (all the applicable requirements of Section 9. hereof) ("requirements"), and Contractor, for and on behalf of itself and its insurance provider(s), certifies and agrees that all insurance coverages (including but not limited to the types, limits, periods of coverage, endorsements and policies applicable or in regard thereto) provided to the Construction Manager hereunder are in accordance and full compliance with the requirements, as reasonably determined and interpreted by the Construction Manager. Contractor, to the fullest extent permitted by applicable law, shall defend, indemnify and save harmless the Construction Manager, Owner and their respective successors, assigns, directors, officers, agents and employees from and against any and all damages and losses, without limitation, including attorneys' fees and costs caused by, arising out of or resulting from the Contractor or its insurance provider(s) refusal or failure to provide all the insurance coverages (including but not limited to the types, limits, periods of coverage, endorsements and policies applicable or in regard thereto) required hereunder, to comply in any respect with the requirements, and/or to fully honor and abide by any of the certifications and/or agreements set forth in this section.

3.14 ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2 Correction of Work

Add the following Subparagraph to 12.2.2:

12.2.2.1 At any time during the progress of the Work, or in any case where the nature of the defects will be such that it is not expedient to have the defects corrected, the Owner, at its option, will have the right to deduct such sum, or sums, of money from the amount of the Contract as it considers justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

3.15 ARTICLE 13: MISCELLANEOUS PROVISIONS

Add the following Paragraph:

13.8 CONFLICTS WITH FEDERAL STATUTES OR REGULATIONS

13.8.1 If any provision, specifications or requirement of the Contract Documents conflict or is inconsistent with any statute, law or regulation of the government of the United States of America, the Contract shall notify the Architect and Owner immediately upon discovery.

3.16 ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.3 TERMINATION BY THE OWNER FOR CONVENIENCE

Delete Paragraph 14.3.3 in its entirety and replace with the following:

14.3.3 In case of such termination for the Owner's convenience the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination along with reasonable overhead.

Add the following Articles and Paragraphs:

3.17 ARTICLE 15 - PREFERENCE FOR DELAWARE LABOR (NEW ARTICLE)

A. 15.1 The Contractor shall comply with the following provisions of Delaware Code, Title 29, Chapter 69, Section 6910:

In the construction of all public works for the State or any political subdivision or by persons contracting with the State or any political subdivision thereof, preference in employment of laborers, workmen or mechanics, shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State. Each public works contract for the construction of public works for the State or any political subdivision thereof shall contain a stipulation that any person, company, or corporation who violates this section shall pay a penalty to the Secretary of Finance equal to the amount of compensation paid to any person in violation of this section.

3.18 ARTICLE 16 - LICENSE AND TAX REQUIREMENTS (NEW ARTICLE)

A. 16.1 Contractor and subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. Contractor's shall submit a copy of all business licenses required by local and state agencies. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, the Contractor shall furnish the State Tax Department, within 10 days after award of contract, a statement of the total values of each contract and subcontract,

together with the names and addresses of the contracting parties. The Contractor, before the payment of any award or amount payable to any Contractor or subcontractor not a resident of Delaware, shall ascertain from said non-resident Contractor or subcontractor and/or the State Tax Department, whether he has obtained a license and satisfied his liability paid by the non-resident Contractor or subcontractor, the Contractor shall deduct from the award the amount payable to said non-resident contractor or subcontractor the amount of said license liability and shall pay same to the State Tax Department within 10 days after final payment and settlement with the non-resident Contractor or subcontractor.

- B. 16.2 Taxes: The Contractor shall pay all sales, consumer, use and other taxes required by law.

3.19 ARTICLE 17 - PREVAILING DELAWARE WAGE RATES (NEW ARTICLE)

- A. 17.1 In accordance with Delaware Code, Title 29, Chapter 69, Section 6960, all laborers and mechanics of the Contractor and all subcontractors employed to perform work directly upon the site of the work shall be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account the full amounts accrued at the time of payment computed at wage rates not less than those determined by the Division of Industrial Affairs, Department of Labor, State of Delaware, as the prevailing rates in this area.
- B. 17.2 This approved scale of wages must be posted by the Contractor in a prominent and easily accessible place at the site of the work.
- C. 17.3 It is further stipulated that there may be withheld from the Contractor such accrued payment as may be considered necessary by the contracting officer to pay laborers and mechanics employed by the Contractor or any subcontractors on the work the difference between the rates of wages required and the rate of wages received by such laborers and mechanics and not refunded to the Contractor, Subcontractor or their agents.
- D. 17.4 Where wage rates are published in this Manual they are issued by the State Department of Labor on the date indicated and are included for the convenience of Bidders. The Owner, the Architect, and the Construction Manager, accept no responsibility for the accuracy or applicability of any rates included herein. The actual wage rate determinations which

will apply to the work will be those in effect on the first day of public advertisement for bids as determined by the State Department of Labor. It will be the responsibility of each bidder to contact the State Department of Labor and to incorporate these rates in his bid.

- E. 17.5 "In accordance with Delaware Code, Title 29, Section 6960 as amended January 24, 2008, contractors shall furnish sworn payroll information to the Department of Labor on a weekly basis for each contract which exceeds \$15,000 for renovation work and \$100,000 for new construction. The construction contract amount is based on a cumulative total of all contracts bid for a specific project. Payroll forms for submission may be obtained from the Department of Labor."

17.5.1 A Payroll Report, available from the Department of Labor is to be used to provide this information.

END OF SECTION

SECTION 007343 – WAGE RATE REQUIREMENTS

1. SUMMARY

- 1.1. In accordance with Delaware Code, Title 29, Chapter 69, Section 6912, all laborers and mechanics of the Contractor and all subcontractors employed to perform work directly upon the site of the work shall be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account the full amounts accrued at the time of payment computed at wage rates not less than those determined by the Division of Industrial Affairs, Department of Labor, State of Delaware, as the prevailing rates in this area.
- 1.2 This approved scale of wages must be posted by the Contractor in a prominent and easily accessible place at the site of the work.
- 1.3 It is further stipulated that there may be withheld from the Contractor such accrued payment as may be considered necessary by the contracting officer to pay laborers and mechanics employed by the Contractor or any subcontractors on the work the difference between the rates of wages required and the rate of wages received by such laborers and mechanics and not refunded to the Contractor, subcontractor or their agents.
- 1.4 Where wage rates are published in this Manual they are issued by the State Department of Labor on the date indicated and are included for the convenience of Bidders. The Owner, the Architect, and the Construction Manager, accept no responsibility for the accuracy or applicability of any rates included herein. The actual wage rate determinations which will apply to the work will be those in effect on the first day of public advertisement for bids as determined by the State Department of Labor. It will be the responsibility of each bidder to contact the State Department of Labor and to incorporate these rates in his bid.
- 1.5 "In accordance with Delaware Code, Title 29, Section 6912, as amended July 5, 1994, contractors shall furnish sworn payroll information to the Department of Labor on a weekly basis for each contract which exceeds \$15,000 for renovation work and \$100,000 for new construction. The construction contract amount is based on a cumulative total of all contracts bid for a specific project. Payroll forms for submission may be obtained from the Department of Labor."
 - 1.5.1 A Payroll Report, available from the Department of Labor is to be used to provide this information.
- 1.6 A copy of the Prevailing Wages for the project is attached hereto.

END OF SECTION

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 451-3423

Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

Located at:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

PREVAILING WAGES FOR BUILDING CONSTRUCTION EFFECTIVE MARCH 15, 2012

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	23.22	29.83	39.20
BOILERMAKERS	65.47	33.22	48.83
BRICKLAYERS	45.63	45.63	45.63
CARPENTERS	49.06	49.06	39.22
CEMENT FINISHERS	40.38	29.11	21.20
ELECTRICAL LINE WORKERS	43.49	37.29	28.44
ELECTRICIANS	59.10	59.10	59.10
ELEVATOR CONSTRUCTORS	73.14	40.93	30.55
GLAZIERS	62.60	62.60	54.20
INSULATORS	50.38	50.38	50.38
IRON WORKERS	58.70	58.70	58.70
LABORERS	37.20	37.20	37.20
MILLWRIGHTS	60.85	60.85	47.42
PAINTERS	40.62	40.62	40.62
PILEDRIVERS	66.42	37.64	30.45
PLASTERERS	21.61	21.61	17.50
PLUMBERS/PIPEFITTERS/STEAMFITTERS	57.95	43.24	46.28
POWER EQUIPMENT OPERATORS	55.81	55.81	24.13
ROOFERS-COMPOSITION	21.01	20.71	17.02
ROOFERS-SHINGLE/SLATE/TILE	17.59	17.50	16.45
SHEET METAL WORKERS	64.39	62.18	62.18
SOFT FLOOR LAYERS	44.92	44.92	44.92
SPRINKLER FITTERS	50.65	50.65	50.65
TERRAZZO/MARBLE/TILE FNRS	50.50	50.50	45.45
TERRAZZO/MARBLE/TILE STRS	57.98	57.98	52.63
TRUCK DRIVERS	22.49	23.89	20.03

CERTIFIED: 4/30/12

BY: [Signature]

ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 451-3423.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: New Dover High School Bid Package F, Kent County



SECTION 10 11 00 - SUMMARY OF WORK

1. RELATED DOCUMENTS

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

2. CONTRACTS

2.1 The work will be performed under separate prime contracts managed by the Construction Manager.

3. ALTERATIONS & COORDINATION

3.1 Contractor shall be responsible to coordinate their work with the work of others, including, but not limited to, the preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from the beginning of activity, through project close-out and warranty periods.

4. KNOWLEDGE OF CONTRACT REQUIREMENTS

4.1 The Contractor and his Subcontractors, Sub-subcontractors and material men shall consult in detail the Contract Documents for instructions and requirements pertaining to the Work, and at his and their cost, shall provide all labor, materials, equipment and services necessary to furnish, install and complete the work in strict conformance with all provisions thereof.

4.2 The Contractor will be held to have examined the site of the Work prior to submitting his proposal and informed himself, his Subcontractors, Sub-subcontractors and material men of all existing conditions affecting the execution of the Work.

4.3 The Contractor will be held to have examined the Contract Documents and modifications thereto, as they may affect subdivisions of the Work and informed himself, his Subcontractors, Sub-subcontractors and material men of all conditions thereof affecting the execution of the Work.

4.4 The Scope of Work for the Contract is not necessarily limited to the description of each section of the Specifications and the illustrations shown on the Drawings. Include all minor items not expressly indicated in the Contract Documents, or as might be found necessary as a result of field conditions, in order to complete the Work as it is intended, without any gaps between the various subdivisions of work.

4.5 The Contractor will be held to be thoroughly familiar with all conditions affecting labor in the area of the Project including, but not limited to, Unions, incentive pay,

procurements, living, parking and commuting conditions and to have informed his Subcontractors and Sub-subcontractors thereof.

5. CONTRACT DOCUMENTS INFORMATION

- 5.1 The Contract Documents are prepared in accordance with available information as to existing conditions and locations. If, during construction, conditions are revealed at variance with the Contract Documents, notify the Construction Manager immediately, but no more than three (3) days from the day the variance is first known. Failure to give timely notice shall operate to waive any claim Contractor might otherwise have for an adjustment to Contract Time or Sum as a consequence of such variance.
- 5.2 The Specifications determine the kinds and methods of installation of the various materials, the Drawings establish the quantities, dimensions and details of materials, the schedules on the Drawings give the location, type and extent of the materials.
- 5.3 Dimensions given on the Drawings govern scale measurements and large scale drawings govern small scale drawings, except as to anything omitted unless such omission is expressly noted on the large scale drawings.
- 5.4 The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive", "open generic/descriptive", "compliance with standards", "performance", "proprietary", or a combination of these. The methods used for specifying one unit of work has no bearing on requirements for another unit of work.
- 5.5 Whenever a material, article or piece of equipment is referred to in the singular number in the Contract Documents, it shall be the same as referring to it in the plural. As many such materials, articles or pieces of equipment shall be provided as are required to complete the Work.
- 5.6 Whenever a material, article or piece of equipment is specified by reference to a governmental, trade association of similar standard, it shall comply with the requirements of the latest publication thereof and amendments thereto in effect on the bid date.
- 5.7 In addition to the requirements of the Contract Documents, Contractor's work shall also comply with applicable standards of the construction industry and those industry standards are made a part of Contract Documents by reference, as if copied directly into Contract Documents, or as if published copies were bound herein.
- 5.8 Where compliance with two (2) or more industry standards, contract requirements, or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, then

the most stringent requirements, which are generally recognized to be also the most costly, is intended and will be enforced, unless specifically detailed language written into the Contract Documents clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently equal but different requirements, and uncertainties as to which level of quality is more stringent, to Architect for decision before proceeding.

- 5.9 Reference standards referenced directly in Contract Documents or by governing regulations have precedence over non-reference standards which are recognized in industry for applicability of work.
- 5.10 Contractor's bid is based on the complete set of Contract Documents including documents not specifically issued as part of the bid pack but referenced in same.

6. SCOPE OF WORK/GENERAL INFORMATION

- 6.1 A Scope of Work for each contract to be awarded on the project follows in this section. When a Contract has been awarded to a Contractor, the successful Contractor will be listed after the title of the Contract. When no Contract has yet been awarded, no Contractor's name will be listed. Previous Scopes of Work include addendum changes.
- 6.2 Contractor is responsible for performing the work listed in the Summary of Work for his contract. Contractor is also responsible for knowing the work that has been assigned to preceding contracts. No additional compensation or extension of time will be allowed a Contractor due to his ignorance of the work assigned to his Contract or to other contracts which may affect his work. The Contractor is responsible, however, for all items which are covered in the Specifications and Drawings relating to their Contract if not specifically mentioned in the Summary of Work.
- 6.3 The Construction Manager will provide on site a source for temporary electric, temporary water and portable sanitation facilities only. It is each Contractor's responsibility to make the necessary connections, including all material for temporary electric and water. Please note that utility charges for office trailers will be the responsibility of the individual Contractors. As well as local permits required for trailers.
- 6.4 A dumpster will be provided on site for free use by Contractors to dispose of non-hazardous, common, work-related refuse. Clean-up is the responsibility of each Contractor. Clean up shall be performed on a daily basis. Contractors not complying will be advised in writing and back charged for all costs associated with the clean up of their work.
- 6.5 Contractors are reminded that there are limited storage areas available on site. Off site storage will be the responsibility of each individual Contractor.

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- 6.6 Office trailer permits off site will be the responsibility of each individual Contractor. On site Contractor's field offices, one (1) per Contractor, if required, will be located as directed by the Construction Manager.
- 6.7 Contractor will be prepared to discuss and submit a detailed project schedule seven (7) days after receipt of Notice to Proceed and to begin its submittal process. The Project Schedule is an integral part of this contract. Certain construction sequences and priorities must take place in order to meet the target dates. Concentrated work periods will occur and each Contractor is responsible to staff the project as required by the current Construction Schedule or as directed by the Construction Manager. Contractor will cooperate with the Construction Manager in planning and meeting the required sequences of work and Project Schedule as periodically updated by the Construction Manager.
- 6.8 All bids must include insurance limits in accordance with Article 11 of the Section 00 73 00 SUPPLEMENTARY CONDITIONS.
- 6.9 Hoisting, scaffolding and material handling is the responsibility of each Contractor, unless otherwise noted.
- 6.10 Contractor will be responsible for layout of its own work. The Construction Manager will provide benchmark and layout of the building line.
- 6.11 Contractor will be responsible to keep clean public roadways soiled by construction traffic on a daily basis. If cleaning is not done, the Construction Manager may perform the cleaning on an overtime basis and backcharge the Contractor responsible.
- 6.12 Contractor Scopes of Work and Schedule are interrelated. Familiarity with each is required.
- 6.13 The Construction Manager will provide testing services for soil, concrete and steel. Other testing as required by the Contract Documents will be in accordance with the technical specifications and/or the individual scope of work. Refer to Specification Section 01 45 00 - QUALITY CONTROL.
- 6.14 Safety is the responsibility of each individual Contractor. The project will be governed under the guidelines of OSHA.
- 6.15 Inter-Contractor shop drawing distribution will be performed by the Construction Manager. Contractor is individually responsible for either coordinating his work with these distributed drawings or notifying the Construction Manager, in writing, of any discrepancies.
- 6.16 Coordination with other trades will be required. The Contractor will be required to

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attend periodic coordination meetings with other trades where requirements, conflicts and coordination issues will be discussed and resolved. Attendance when requested will be mandatory. If inter-Contractor coordination is not satisfactorily performed, the conflicting Contractors shall mutually share the cost to relocate and/or reinstall their work.

- 6.17 Contractor shall submit a schedule of values to the Construction Manager through the Building Blok Management Program prior to the submission of their first invoice for approval on AIA G702/CMA, Application for Payment and G703, Continuation Sheet.
- 6.18 Contractor is expected to review and coordinate its Work with the complete set of Contract Documents, including all items noted as by his trade whether or not shown on that particular set of drawings. Documents are available at the site for review.
- 6.19 Contractor is responsible for obtaining all necessary permits required for his work, including street permits. Unless otherwise noted, building permit shall be secured by the Construction Manager. Any subcontractor who will be restricting access to street, right of way or adjacent property must notify the Construction Manager 48 hours in advance.

The documents require the Subcontractor to secure their own permits. In some jurisdictions (Middletown, Newark, etc.) the permit (Mechanical, HVAC, etc.) is included in the Building Permit and you must specifically advise Subcontractor of the assessment and amount in order to avoid having them not be responsible.

- 6.20 Contractor's License: Submit a copy of all business licenses required by local and state agencies.
- 6.21 Contractor shall absorb, without additional compensation, any and all costs of working beyond normal hours to maintain job progress in accordance with the current construction schedule.
- 6.22 No asbestos or PCB's in or on any material or equipment will be accepted or allowed on this project. All hazardous materials will be treated in accordance with all State and Federal regulations.
- 6.23 Daily clean up of the work is the responsibility of each individual Contractor which includes broom cleaning of their debris as required. Contractor will be individually back charged by the Construction Manager for clean up not satisfactorily performed by the Contractor.
- 6.24 In the event asbestos is uncovered, the Contractor shall notify the Construction Manager of the areas requiring removal of asbestos. The Construction Manager shall then coordinate the removal with the Owner.

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- 6.25 This project is to be constructed adjacent to and in existing buildings. Contractor shall exercise all due precautions to minimize noise, air pollution and any other construction hazards which in any way would cause discomfort or danger to the occupants of the existing building in the area.
- 6.26 Existing mechanical, electrical, plumbing, sprinkler, medical gas, fire alarm, etc. systems will be shut off and locked out by the Owner as required by the Work. Tie-in's and modifications to those systems will be performed by the specific Contractor associated with the work as indicated in the Contract Documents. Re-energizing and re-start up of all systems should be performed by the Owner.
- 6.27 The Safety Cable System shall not be altered or removed without a written request submitted to the Project Manager with a copy to the Field Manager. It shall be the responsibility of each and every Contractor that is removing or altering the Safety Cable System to maintain the fall protection safety provided by the safety cable and not leave the area unprotected. Each and every Contractor shall be responsible to re-install the Safety Cable System immediately after work is completed. Each and every Contractor shall be responsible to re-install the Safety Cable System in accordance to OSHA standards.
- 6.28 Normal work hours for this project are from 7:00 a.m. to 3:30 p.m. Any work to be performed outside of these hours must receive prior approval from the Construction Manager. Requests to work beyond normal work hours shall be submitted at least 48 hours prior.
- 6.29 Contractor is responsible for having a competent project superintendent/foreman on-site during all work performed under its contract.
- 6.30 In the event the Contractor has non-English speaking employees or subcontractors on the project, they shall have a superintendent or foreman on site, at all times, who speaks English and can communicate with Contractor's employees. Should the Contractor fail to meet this requirement, at any time, Construction Manager may direct all Work to stop until the proper supervision is on site. The Contractor will be responsible for maintaining the project work schedule and make up at its own expense, any delay to the Schedule resulting from the work stoppage.
- 6.31 Punch List Procedures: Contractor shall be given a copy of the punch list with his appropriate work identified. Contractor shall have nine (9) calendar work days to complete its punch list work. On the 10th day or as determined by the Construction Manager, the Construction Manager shall employ other contractors, as required, to complete any incomplete punch list work and retain from the appropriate Contractors retainage all costs incurred.
- 6.32 Contractor shall provide the necessary safety barricades and railings required to complete their work and comply with all OSHA, local code and contract

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specifications.

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Bid Package 'G'**

CONTRACT NO. NDHS-33 SITE, FIELD STADIUMS AND ACCESSORIES

A. Work included in this contract consists of, but is not necessarily limited to, all labor, materials and equipment for:

- Technical Specification sections:

Division 0	Bidding and Contract Requirements
Division 1	General Requirements
Section 017419	Construction Waste Management and Disposal
Section 018113	Sustainable Design Requirements LEED for Schools
Section 033000	Cast-In-Place Concrete
Section 042000	Unit Masonry
Section 11 66 23	Track and Field Equipment
Section 12 93 13	Site Furnishings
Section 13 34 16	Grandstands and Bleachers
Section 32 31 13	Chain Link Fences and Gates
Section 32 31 15	Ornamental Steel Fencing

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

- Provide sitework, utilities for work assigned with the contract.
- Furnish, install, maintain and remove sediment control system including sediment control plan. Maintain sediment control until substantial completion established by DNREC.
- Clearing and grubbing as necessary to accomplish work indicated on plans and specifications.
- Topsoil shall be stripped and stockpiled as necessary to accomplish your work.
- Rough grading for area defined on site drawings for buildings, lawn areas, bituminous pathways. Preparation of subgrade for building slabs.
- This Contractor is responsible for all excavation and backfill for work associated with this contract scope.
- Provide a certified construction reviewer (CCR) to perform inspections and provided written reports; signed and sealed by professional engineer. Coordinate with DNREC.
- Provide all permits related to work for this project outside of building permit.
- Owner to provide City of Dover building per for structures.

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- Contractor to provide all permits; including City plumbing permit.
- Furnish, install and remove temporary orange construction fencing as required. To protect your work areas during construction.
- Proof rolling of limit of excavation.
- This contractor to provide all utility work as detailed on plans and specifications for Bid Package G, see documentation or plans.
- Backfilling as detailed below is the responsibility of this Contractor. Soil types shall be in accordance with DelDot standard specifications.
- It is the intent to use on site material and not imported fill. The use of this onsite material shall conform to the compaction requirements as specified on the civil drawings. If the on site material does not meet those requirements or if there is insufficient on site material available, this contractor shall import at no additional expense to the project sufficient material to complete the work.
- Provide perimeter protection of all excavated areas until suitably backfilled.
- Provide all finished fields and synthetic fields per plans and specifications.
- Provide all track and field equipment.
- Provide street cleaning of mud, etc. on daily basis.
- Provide all site furnishings.
- Include all costs for temporary barricades, arrows, pedestrian protection, flagmen, etc. required to complete the work.
- Provide all grandstands, bleachers and press boxes.
- Base bid shall include all standard dewatering measures; utilizing trenches, crocks, stone and portable pumping measures. This contractor to provide these measures as required to perform their work.
- Provide all fencing and gates.
- The Contractor shall provide and maintain all temporary access road to and from the work areas.
- Provide ornamental fencing and gates.

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- Temporary water will be the responsibility of the individual Contractors. The Construction Manager will not provide this service.
- Provide all masonry pavers.
- Provide all concrete walks, aprons and roadways.
- Provide all lawn areas as indicated on drawings.
- Provide alternates to supply meadow planting in lieu of standard turf.
- Provide all planting and mulching as indicated.
- Provide all utility connections as indicated including all taps and distribution in all areas documented for Bid Package G.
- Contractor to provide a \$40,000 allowance for work to be determined by the Construction Manager.
- Provide irrigation systems as defined.

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CONTRACT NO. NDHS-34 GENERAL CONSTRUCTION

A. Work included in this contract consists of, but is not necessarily limited to, all labor, materials and equipment for:

- Technical Specification sections:

Division 0	Bidding and Contract Requirements
Division 1	General Requirements
Section 017419	Construction Waste Management and Disposal
Section 018113	Sustainable Design Requirements LEED for Schools
Section 033000	Cast-In-Place Concrete
Section 042000	Unit Masonry
Section 04 72 00	Cast Stone
Section 05 12 00	Structural Steel Framing
Section 05 21 00	Steel Joist Framing
Section 05 31 00	Steel Decking
Section 05 40 00	Cold-Formed Metal Framing
Section 05 50 00	Metal Fabrications
Section 06 10 00	Rough Carpentry
Section 06 20 00	Finish Carpentry
Section 07 21 00	Thermal Insulation
Section 07 26 40	Spray Polyurethane Foam Insulating Air Barrier
Section 07 26 16	Under-Slab Vapor Barrier/Retarder
Section 07 42 13	Metal Wall Panels
Section 07 53 00	Elastomeric Membrane Roofing
Section 07 62 00	Sheet Metal Flashing and Trim
Section 07 71 00	Roof Specialties
Section 07 72 00	Roof Accessories
Section 07 90 05	Joint Sealers
Section 08 11 13	Hollow Metal Doors and Frames
Section 08 33 23	Overhead Coiling Doors
Section 08 33 33	Coiling Counter Doors
Section 08 43 13	Aluminum-Framed Storefronts
Section 08 06 71	Door Hardware Schedule
Section 08 71 00	Door Hardware
Section 08 80 00	Glazing
Section 08 91 00	Louvers
Section 09 05 61	Common Work Results For Flooring Preparation
Section 09 21 16	Gypsum Board Assemblies
Section 09 51 00	Acoustical Ceilings

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Section 09 65 66	Resilient athletic Flooring
Section 09 67 00	Fluid-Applied Flooring
Section 09 68 13	Tile Carpeting
Section 09 90 00	Painting and Coating
Section 10 11 01	Visual Display Boards
Section 10 21 13.19	Solid Composite Toilet Compartments
Section 10 28 00	Toilet, Bath, and Laundry Accessories
Section 10 44 00	Fire Protection Specialties
Section 10 51 00	Lockers
Section 11 40 00	Foodservice Equipment
Section 12 21 13	Horizontal Louver Blinds
Section 12 34 00	Laminate Clad Casework
Section 12 36 00	Countertops, Backsplashes and Window Stools

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

This contract will be for the General Building package associated with the ancillary buildings located throughout the site of Dover High School. They include the following:

- North Building Fieldhouse
- East Building Fieldhouse
- West Building Fieldhouse
- Maintenance Building
- Ticket Booths
- Ball Field Concessions
- Dugouts

It will be the responsibility of NDHS- Contract 34 to provide these building in their entirety from subgrade to final acceptance. This includes all building construction as well as the MEP work required. The Owner will provide the building permit. The Contractor will be responsible for all other permits required by the City of Dover, Kent County or any other governing agency having jurisdiction over this work site.

- This Contractor to provide secure dry storage for all doors, frames and hardware until work has been installed.
- All field trimming required to adjust to existing conditions.
- This Contractor shall include in the base an allowance of \$30,000 for work to be determined by the Construction Manager.
- This Contractor shall at a minimum provide a fire extinguisher rated not less than 2A for each structure while construction is underway.

END OF SECTION

SECTION 01 21 00 - ALLOWANCES

1. RELATED DOCUMENTS

- 1.1 The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- 1.2 Refer to provisions in AIA General Conditions A201/CMa – 1992 Edition, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION WHERE THE CONSTRUCTION MANAGER IS NOT A CONSTRUCTOR, for requirements in addition to those specified in Division 1.
- 1.3 Refer to Scope Information Sheets for all contracts bound in the Project Manual under Section 01 11 00 - SUMMARY OF WORK. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- 1.4 For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.
- 1.5 Include in the Contract Sum all lump sum and unit cost allowances stated in the Contract Documents.
- 1.6 Designate in the construction progress schedule the delivery dates for products specified under each allowance.
- 1.7 Designate in the Schedule of Values the quantities of materials required under each unit cost allowance.

2. ALLOWANCES FOR PRODUCTS

- 2.1 The amount of each allowance includes:
 - A. The cost of the product or labor to the Contractor or Subcontractor, less any applicable trade discounts.
 - B. Delivery to the site.
 - C. Labor required under the allowance, only when labor is specified to be included in the allowance. If labor is not specified to be included in the allowance, it shall be included in the Contractor's bid and in the resulting Contract Sum.
 - D. Applicable taxes.

- E. Profit and overhead.
- 2.2 In addition to the amount of each allowance, include in the Contract Sum the Contractor's costs for:
- A. Handling at the site; including unloading, uncrating and storage.
 - B. Protection from the elements and from damage.
 - C. Labor for installation and finishing, except where labor is specified to be a part of the allowance.
 - D. Other expenses required to complete the installation.
 - E. Contractor's and Subcontractor's overhead and profit.
- 2.3 Refer to Scope Information Sheets under Section 01 11 00 - SUMMARY OF WORK for the amount of each lump sum allowance and for work specified in the specification sections listed below.
- A. Section 02072: Provide labor under direction of CM.
3. ADJUSTMENT OF COSTS
- 3.1 Should the net cost be more or less than the specified amount of the allowance, the Contract Sum will be adjusted accordingly by Change Order.
- A. For products and labor specified under a unit cost allowance, the unit cost shall apply to the quantities actually used with a nominal allowance for waste, as determined by receipted invoices, or by field measurement.
- 3.2 At Contract closeout, reflect all approved changes in Contract amounts in the final statement of accounting.

END OF SECTION

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SECTION 01 22 00 - UNIT PRICES

1. GENERAL PROVISIONS

- 1.1 The general provision of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- 1.2 Refer to provisions in AIA Document A201/CMa - 1992 Edition, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION WHERE THE CONSTRUCTION MANAGER IS NOT A CONSTRUCTOR, for requirements in addition to those specified in Division 1.
- 1.3 For work being constructed under separate prime contract, provisions of this Section apply to each contract being bid.

2. BASE BID

- 2.1 The Base Bid shall consist of all work shown or specified in the Contract Documents, exclusive of any Additive Unit Prices specified herein.
- 2.2 The Base Bid shall include all work in any Subtractive Unit Prices specified herein.

3. UNIT PRICES

- 3.1 State in the Bid Form the amount to be added to (or subtracted from) the Base Bid per unit of measurement for each Unit Price specified. State this amount to include all overhead and profit. No surcharge in addition to the Unit Price listed will be permitted.
- 3.2 See Section 00 21 13, INSTRUCTIONS TO BIDDERS for related information.
- 3.3 For description of Unit Prices requested, refer to the specification. The method of stating the Unit Prices is described in the Bid Form.
- 3.4 Where both add and deduct unit prices are requested, there shall not be more than a 10% variation between the two.

4. APPLICATION OF UNIT PRICES

- 4.1 Unit prices stated in the Bid Form will apply from the time the Bid is submitted until Contract completion.

5. MEASUREMENT OF QUANTITIES

- 5.1 Quantities shall be determined by field measurement by contractor personnel and as

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verified by the Construction Manager.

5.2 At the Contractor's option, and at his expense, measurement may be made by a registered surveyor.

6. LIST AND DESCRIPTION OF UNIT PRICES

N/A

END OF SECTION

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SECTION 01 23 00 - ALTERNATES

1. GENERAL PROVISIONS

- 1.1 The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- 1.2 Refer to provisions in AIA Document A201/CMa - 1992 Edition, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION WHERE THE CONSTRUCTION MANAGER IS NOT A CONSTRUCTOR for requirements in addition to those specified in Division 1.
- 1.3 For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

2. BASE BID

- 2.1 The Base Bid shall consist of all work shown or specified in the Contract Documents, exclusive of any Additive Alternates specified herein.
- 2.2 The Base Bid shall include all work in any Subtractive Alternates specified herein.

3. ALTERNATES

- 3.1 State in the Bid Form the amount to be added to the Base Bid for each Alternate specified.
- 3.2 See Section 002113 - INSTRUCTIONS TO BIDDERS for related information.
- 3.3 The description of Alternates contained herein is in summary form. Detailed requirements for materials and execution shall be as specified in other sections and as shown on drawings.

Alternate BPG-25: Add Remote Athletics Building.

Add \$ _____

Alternate BPG-26: Add Maintenance Building.

Add \$ _____

Alternate BPG-27: Add for Enlarged Football Bleacher Design – Main Stadium.

Add \$ _____

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Alternate BPG-28: Add Soccer Bleachers – Auxiliary Stadium.

Add \$ _____

Alternate BPG-29: Add (4) Tennis Courts.

Add \$ _____

Alternate BPG-30: Add Ticket Booths and Signage Structures – Main & Auxiliary Stadium.

Add \$ _____

Alternate BPG-31: Add Canopies above Entry Gates – Main Stadium.

Add \$ _____

Alternate BPG-32: Add Lighting / Light Bases at Tennis Courts.

Add \$ _____

Alternate BPG-33: Add Lighting / Light Bases at Baseball / Softball Stadiums.

Add \$ _____

Alternate BPG-34: Add for "Blue" Color for all Synthetic Running Surfaces (in lieu of "Red").

Add \$ _____

Alternate BPG-35: Add Synthetic Athletic Turf at Main Baseball / Main Softball Stadium's playing surfaces.

Add \$ _____

Alternate BPG-36: Add Unit Paving Areas (in lieu of Scored Concrete).

Add \$ _____

Alternate BPG-37: Add Flagpole Plinth Monuments.

Add \$ _____

END OF SECTION

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SECTION 012600 - CHANGE ORDER PROCEDURES

1. GENERAL:

- 1.1 The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- 1.2 Refer to provisions in AIA Document A232 – 2009 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.
- 1.3 The Construction Manager is responsible for processing all change orders. Each request will be assigned a change order request (COR) number. The Change Order Request & Execution Form will be initiated via the web-based project management system (Building Blok) used by the CM.
- 1.4 It is to be clearly understood that no extra work shall commence without an approved written and executed change order from the Owner.

2. INITIATING A CHANGE ORDER:

- 2.1 Specific changes initiated by the Owner, Architect, Construction Manager (CM) or Contractor will be processed as follows:
 - A. The Owner will authorize the Architect to prepare sufficient documents to establish an accurate price. These documents to be forwarded to the Construction Manager and Owner “for pricing only, not authorized for construction.” The Construction Manager will develop the estimate (within 2 weeks) showing a breakdown by trades with all trade contractor quotes. The Owner will approve or reject the change request within two (2) weeks. If the Owner elects to proceed with the change, the Construction Manager will prepare formal change orders to the various trade contractors involved in the change and reference in all formal change orders the original change order request number.
 - B. Field Change: Contractor shall immediately notify the Construction Manager of a change due to field conditions or site conditions. If documents cannot be prepared for pricing due to schedule constraints, the Construction Manager will make every effort in estimating the field change. If the Owner and Construction Manager agree that certain field changes should be handled on a time and material basis, the Construction Manager will closely monitor the Contractor's labor and material affecting this change. At the completion of the work a formal change order will be issued.
 - C. Contractor Change: If a Contractor initiates a change order for work not included in the Contract, the Construction Manager and Architect will research the validity of the request, verify quantities and pricing and submit to the Owner for approval on a

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change order request.

- 2.2 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor, Construction Manager and the Architect.
3. PROCESSING A CHANGE ORDER:
- 3.1 The Contractor will fill in the Change Order Request & Execution Form (COREF) with a brief description of the change, any time extension, and cost changes.
- 3.2 The Contractor will attach to the COREF copies of the written quotations from the trade contractors, Contractors, and suppliers. The Labor Detail Sheet and the Change Order Detail forms must be added as an attachment to the COREF. The Contractor and each sub-tier contractor (as applicable) must fill out the Labor Detail Sheet and Change Order Detail Sheet. Samples of these forms are attached.
- 3.3 In all cases, this cost or credit shall be based on the "DPE" wages required and the "invoice price" of the materials/equipment needed.
- 3.4 "DPE" shall be defined to mean "direct personnel expense". Direct payroll expense includes direct salary plus customary fringe benefits (prevailing wage rates) and documented statutory costs such as workman's compensation insurance, FICA, and unemployment insurance.
- A. "Fringe Benefit" is any medical, life or disability insurance, paid time off, etc.
 - B. "Worker's Compensation" is the insurance required for injuries including medical leave, etc.
 - C. "FICA" is the costs association with Social Security and Medicare insurance.
 - D. "Unemployment insurance" is the cost associated with the governmental assessment for employee's unemployment benefits.
- 3.5 "Invoice price" of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor (or Subcontractor) to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity.
- 3.6 In addition to the above, the Contractor is allowed markup for overhead and profit on additional work performed as outlined in Specification Section 012613, Contractor Compensation.
- 3.7 Building Blok Procedures: The Contractor will submit all change order requests and supporting documentation via the Building Blok web-based project management system. Each Contractor will be issued a unique login and password. Each contractor must
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submit the information as follows:

- A. Create a new change order, from your "To-Do List" by clicking on the "Create Issue" tab in the upper right corner and select "Change Order Request".
- B. The Contractor will enter a brief description of the change in the "Summary" block. A detailed description of the change will be entered in the "Description of Change" block, to include any changes to documents or time extension. The cost of the change will be entered in the "Total Cost Change" block.
- C. The Labor Detail Sheet and the Change Order Detail forms must be added as an attachment to the request. The Contractor and each sub-tier contractor (as applicable) must fill out the Labor Detail Sheet and Change Order Detail Sheet. Samples of these forms are included behind this section. In addition to these forms, the Contractor also must attach any material and equipment rental quotations. All of these documents should be scanned and saved as a PDF file. Click on the "Browse" box to upload the file. Be sure to wait until Building Blok tells you the file was "Uploaded Successfully".
- D. Once the information is entered on the form and the proper attachments are uploaded, the contractor will click "Save". The Contractor will be prompted to enter their password to approve an electronic signature. Once you save the request you will have an opportunity to check it before submitting it to the CM. After you verify the COREF is correct click "Recommend Approval" to submit the change request to the CM. The Contractor will then be prompted to re-enter the password to approve an electronic signature and complete the submission request. Click on "Home" in the upper left corner to make sure the change order does not appear on your To-Do List.
- E. The Change Order Request will then be reviewed by the CM Project Manager and Recommended for Approval, Rejected, or returned to the Contractor for additional information. Once the Construction Manager, Owner, and Architect have approved the request all parties will receive an email from Building Blok notifying them that a fully executed Change Order and Contract Recalculation Form can be downloaded from Building Blok. Hard copies of the executed change order and recalculation form will not be provided by the CM.

It is to be clearly stated that no extra work shall commence without an approval from the **Owner or Construction Manager** or Owner's representative.

END OF SECTION

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CHANGE ORDER REQUEST & EXECUTION FORM

110 South Poplar Street
Suite 400
Wilmington, DE 19801

Tel. 302-421-5700
Fax 302-421-5715

DATE:

PROJECT NAME:

CONTRACT:

REQUEST NUMBER:

CONTRACTOR:

CHANGE ORDER NUMBER:

STATE PO NUMBER:

The following is a summary of the request submitted by the contractor as described above. All supporting documents have been attached and described herewith. This summary shall contain a total amount of compensation requested by the contractor as well as any request for an extension in contract time. It shall be understood that the amounts described below shall remain valid for a period of sixty days from the date described above unless otherwise stated.

A detailed breakdown of Labor, material, equipment, and subcontract costs must be attached to be considered for review.

1. Summary Description(s):
2. Changes to the Contract Drawings:
3. Changes to the Project Manual:
4. Total Cost Change:
5. Total Time Change:

REVIEWED		
This request has been reviewed and ___approval___disapproval is recommended by:		
Name	Title	Date
APPROVED		
This change order request is not approved until executed by all parties bound by a contractual relationship. Upon execution it shall represent a modification to the agreement and is subject to all terms and conditions of the contract documents.		
Contractor: _____		Architect: _____
Signed By: _____		Signed By: _____
Title: _____		Title: _____
Date: _____		Date: _____
EDiS Company _____		Owner: _____
Signed By: _____		Signed By: _____
Title: _____		Title: _____
Date: _____		Date: _____



CHANGE ORDER DETAIL FORM
 (Provided by contractor, subcontractor or sub tier contractor)

DATE SUBMITTED:

CONTRACT:

CONTRACTOR:

PROJECT NAME:

CHANGE ORDER REQUEST #:

LABOR SECTION			
TRADESMAN(s):	LABOR HOURS	RATE (per schedule)	SUBTOTAL
Subtotal			

MATERIAL SECTION			
MATERIAL:	QUANTITY	UNIT COST	SUBTOTAL
Subtotal			

EQUIPMENT SECTION			
EQUIPMENT:	QUANTITY	UNIT COST	SUBTOTAL
Subtotal			

SUBTOTAL	
SUBCONTRACTOR/ SUB TIER*	
OH & PROFIT (10% on sub/sub tier only)	
BOND COST	
OH & PROFIT (15% on own work)	
GRAND TOTAL	

SECTION 01 26 13 - CONTRACTOR COMPENSATION

1. GENERAL

- 1.1 The Contractor agrees to perform any additional Work, for the net cost of materials and labor (including wages paid, payroll taxes, and all insurance) plus the following percentage for all of his overhead and profit, which includes Field Supervision:

The percentages to be added or allowed for any Work change involving both added Work and omitted Work shall be applied only to the net difference in cost.

- (a) 15% mark-up (10% overhead and 5% profit) by the Contractor on Work performed by his own forces.
 - (b) For work done by a Subcontractor, 10% for subcontractor overhead and 5% for subcontractor profit to which the Contractor may add 7.5% for his overhead and profit combined.
 - (c) Contractor mark-up shall include supervision, home and field overhead, all self-owned small tools and equipment.
- 1.2 When the Contractor is directed to perform overtime work at the CM (Owner) expense to accelerate contractual work, the cost for same shall only be the actual premium costs incurred by the Contractor.

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

1. GENERAL PROVISIONS

- 1.1 The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- 1.2 Refer to provisions in either AIA Document A201/CMA - 1992 Edition, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION WHERE THE CONSTRUCTION MANAGER IS NOT A CONSTRUCTOR for requirements in addition to those specified in Division 1.
- 1.3 For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

2. REQUIREMENTS INCLUDED

- 2.1 Submit Applications for Payment to Construction Manager in accordance with the schedule and procedures established in the Contract Documents.

3. RELATED REQUIREMENTS

- 3.1 Owner-Contractor Agreement.
- 3.2 Conditions of the Contract: Article 9 PAYMENTS AND COMPLETION.
- 3.3 Section 01 31 13: Project Meetings
- 3.4 Section 01 33 00: Submittals
- 3.5 Section 01 77 00: Contract Closeout

4. FORMAT AND DATA REQUIRED

- 4.1 Submit Schedule of Values and itemized applications through the Building Blok System.
- 4.2 Provide itemized data on Continuation Sheet:
 1. Format, schedules, line items and values: Duplicates of those of the schedule of values previously accepted by the Construction Manager.

5. PREPARATION OF APPLICATIONS FOR PROGRESS PAYMENTS

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5.1 Schedule of Values and Applications for Payment to be processed through the Building Blok Management Program.

6. PREPARATION OF APPLICATION FOR FINAL PAYMENT

6.1 Fill in Application form as specified in progress payments.

7. SUBMITTAL PROCEDURES

7.1 Complete Invoice:

1. Submit completed Application to the Construction Manager by the 25th of each month.

7.2 To be submitted through the Building Blok Management Program.

END OF SECTION

SECTION 01 31 13 - PROJECT COORDINATION MEETING

1. PROJECT COORDINATION MEETING

1.1 An on-site project coordination meeting will be held on a biweekly basis throughout the project construction period.

2. ATTENDANCE

2.1 Attendance at the project coordination meeting is mandatory of each Contractor or major supplier on the project.

2.2 The representative of the Contractor shall be the Project Manager and field superintendent, unless a substitute representative has been approved by the Construction Manager.

2.3 Contractor will begin attending the Project Coordination Meetings at least 4 weeks prior to mobilization on site, and will continue until the Contractor has fulfilled the obligations of his Contract.

3. AGENDA

3.1 The Construction Manager will set the agenda for the biweekly Project Coordination Meeting.

3.2 At a minimum, the Contractor shall be prepared to discuss the following:

1. Actual vs. as planned progress for the prior two week period.
2. Planned construction activities for the next four weeks.
3. Contract document clarifications.
4. Coordination items with other contractors.
5. Quality Control.
6. Recently issued change orders.
7. Potential change orders.
8. Submittals and shop drawings.
9. Other items requiring Construction Manager's attention.

END OF SECTION

SECTION 01 31 16 - BIM MODELING COORDINATION DRAWING GUIDELINES

1. GENERAL

- 1.1 All Sheetmetal, Mechanical Piping, Plumbing, Fire Protection (FP), Electrical and ATC Subcontractors will be required to prepare 3D coordination drawing using the latest AutoCAD and Navisworks Clash Detective programs. Coordination drawings will be distributed via email and/or disk. The mechanical piping and plumbing work may be awarded to the same subcontractor so some steps such as emailing amongst themselves may not apply; the procedures contained herein will generally be the same. All costs shall be included in the contractors bid.

NOTE: The coordination drawings will be administered through the Building Blok Project Manager system. See Section 01 12 50 Web Based Project Manager System for Construction.

- 1.2 Contract architectural, MEP and structural drawings (3D) will be available electronically from the designated FTP site.
- 1.3 All ductwork, piping and electrical systems shall be thoroughly dimensioned as to location and height above finished floor. Each different system will be drawn in a different color. Yellow shall not be used. Text shall be uniform in size across all trades. Object blocks (i.e. sprinkler heads) shall be indicated close to their actual size. Piping 2" and larger shall be indicated as a double line. Insulation thickness of pipes and duct shall be indicated.
- 1.4 The Sheetmetal Subcontractor will take the lead and develop a drawing list for approval by the Construction Manager subdividing the buildings into separate areas of zones. The drawing list will be for submission and will indicate a submission schedule coordinated with the construction activities. The drawings shall be developed in a sequential fashion so as to not delay installation of the work or the overall project schedule. The Sheetmetal Subcontractor shall include a master key plan so that the area of each drawing can be readily identified as to the location within each building. The Construction Manager shall prepare a schedule identifying the activity and duration of each submission.
- 1.5 Following a coordination kick-off meeting, a list of each subcontractor, their coordination contact person, phone number and email addresses will be generated and distributed to all parties. As each drawing is completed, it is to be emailed to each party on the coordination list.
- 1.6 The Sheetmetal Subcontractor shall maintain a weekly status log on the Building Blok System. Each subcontractor is responsible to submit and coordinate his work with each trade.

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- 1.7 Preparation of coordination drawings shall commence at the issuance of a letter of intent. The coordination drawings may lack data in certain instances pending receipt of equipment drawings, but sufficient space shall be allotted for the items affected. When final information is received, such data shall be promptly inserted on the composite by that subcontractor.
- 1.8 Coordination drawings shall indicate clearances for servicing and accessing equipment, including space for equipment disassembly required for periodic maintenance.
- 1.9 Coordination is the responsibility of all MEP subcontractors; the Sheetmetal Contractor shall assign a project manager dedicated to oversee this process. The Sheetmetal Project Manager will call meetings, weekly, or as required, which subcontractors must attend to avoid delay. Failure to attend will require the subcontractor to field run the work not coordinated. No extra compensation will be paid to any subcontractor for relocating any equipment, duct, pipe, conduit or other material that has been installed without proper coordination. If the installation of any uncoordinated work or improper installation or coordinated work necessitates additional work by other Subcontractors, The cost of such additional work shall be assessed to the Subcontractor responsible as determined by the Construction Manager.
- 1.10 At the conclusion of each composite drawing(s) coordination process, the Sheetmetal Subcontractor will notify the Construction Manager whereupon an on-site coordination meeting will be scheduled for the purpose of signing off on each respective drawing(s). Each Subcontractor will not be authorized to release any material for fabrication or installation until the composite drawing(s) has been prepared and the signature process is executed and approved by the Construction Manager.
- 1.11 Coordination drawings of the underground and underslab piping by the plumbing Subcontractor and electrical work will be required. These drawings shall be prepared in 3D modeling software. The Plumbing Contractor shall proceed in the preparation of the coordinated underground plumbing drawings. The Plumbing Contractor shall add to the background drawings pertinent information such as footings, grade beams, column piers, etc. into the background. The Plumbing Contractor shall include location, invert, size and plumbing accessories, dimensioned to centerline of adjacent columns. At the completion of this work, the Plumbing Contractors will E-mail their work to the Electrical Contractor for incorporation of all below slab electrical conduit and electrical utilities. Upon completion of this work, the Plumbing Contractor shall prepare a coordinated underground composite plan for sign-off as described in Paragraph 1.22 below:
- 1.12 As soon as practical, the Sheetmetal Subcontractor will coordinate the background model of all architectural elements of the building indicating all walls, partitions,

columns, concrete beams, structural steel with bottom of steel elevations, windows, doors, room numbers, ceiling heights, ceiling types, and ceiling layouts, floor elevations and other structural and architectural features. The Sheetmetal Subcontractor shall prepare but not limited to reflected ceiling plans showing the location of light fixtures (which shall include depths), speakers, smoke/heat detectors, fire alarm horn/strobes, sprinklers, grilles, registers, diffusers and any other components requiring coordination. In addition, the Sheetmetal Subcontractor shall inform the Project Manager of any changes in layouts or dimensions as may be issued during the coordination process through addendums, bulletins, RFIs etc. The Sheetmetal Subcontractor shall electronically forward these background drawings to all participants.

- 1.13 Once the layout drawings are prepared all subcontractors shall incorporate all equipment and panels into the model prior to the Sheetmetal Subcontractor proceeding with their own work. Thereafter the Sheetmetal Subcontractor will prepare layout drawings of all ductwork. These drawings will show all wall fire ratings, registers, grilles, diffusers and similar features as well as locations of all valves, dampers, damper operators and other items requiring access for maintenance. All dimensions should be from centerlines of columns and ductwork elevations shall be from finished floor slab.
- 1.14 The Sheetmetal Subcontractor upon completion of his work will electronically forward his data to the Mechanical Piping Subcontractor and copy all participants. The Mechanical Piping Subcontractor shall download the sheetmetal data and incorporate, by separate layer, their own piping routing, valves (including control valves) with valve tags, as well as other areas requiring access for service and maintenance to determine their relationship and possible interference with the mechanical, architectural or structural features to be performed as part of the work.
- 1.15 The Mechanical Piping Subcontractor upon completion of his work will electronically forward his data to the Plumbing Subcontractor and copy all participants. The Plumbing Subcontractor shall download the sheetmetal and piping data and incorporate, by separate layer, their own routing as well as other areas requiring access for service and maintenance to determine their relationship and possible interference with the mechanical, architectural or structural features to be performed as part of the work.
- 1.16 The Plumbing Piping Subcontractor upon completion of his work will electronically forward his data to the FP Subcontractor and copy all participants. The FP Subcontractor shall download the drawing and incorporate, by separate layer, their own routings as well as other areas requiring access for service and maintenance, to determine their relationship and possible interferences with the mechanical, electrical, plumbing and architectural or structural items to be installed as part of the overall work.

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- 1.17 The Fire Protection Subcontractor will then electronically forward his data to the Electrical Subcontractor(s) and copy all participants. The electrical Subcontractor shall download the drawing and incorporate, by separate layer, their own routings of conduit equal to or greater than 2", bus ducts, cable tray, junction boxes, as well as the depth of all light fixtures, access panels, etc. as required to determine the relationship and possible interferences with the plumbing, mechanical, architectural or structural items to be installed as part of the overall work. In addition the Electrical Subcontractor shall indicate the location of all electrical panels, substations, switchgear, and MCC's. The Electrical Subcontractor will be responsible to verify that the electrical lighting layout shown on these drawings is correct and to make corrections and additions of all other light fixtures as required. In areas where no mechanical work occurs, but where other crowded electrical installations are evident, the Electrical Subcontractor shall prepare similar drawings.
- 1.18 The Carpentry Subcontractor shall review each issuance of every drawing to determine any possible interference with wall, soffit or ceiling construction and resolve with the respective subcontractors. The ATC Subcontractor shall review each issuance of every drawing to determine any possible interference regarding locations of controls to ensure sufficient access to them is being maintained.
- 1.19 The Sheetmetal Subcontractor shall provide one color composite set of drawings and forward them to the Construction Manager. This composite will then be reviewed during meetings determined by the Construction Manager at which all subcontractors shall be represented in order to review and resolve any real or apparent interference or conflicts.
- 1.20 In the preparation of all the final composite drawings, large scale details as well as cross and longitudinal sections shall be made as required to fully delineate all conditions. Particular attention shall be given to the locations, size and clearance dimensions of equipment items, shafts and similar features. The final composite drawings shall include the locations of all controls, tie-ins, connections for other subcontractor's work, and pipe and duct insulation as required. Each trade subcontractor indicating their acceptance and approval of the indicated routings and layouts and their relationship with the adjoining or contiguous work of all subcontractors shall then sign off these final composite drawings. Therefore, no unauthorized deviations will be permitted. If deviations are made without the knowledge and agreement of the Construction Manager and other affected Subcontractors, the work in question will be subject to removal and correction at no additional cost to the Owner.
- 1.21 In preparing the composite drawings, minor changes in duct, pipe or conduit routings that do not affect the intended function may be made as required to avoid space conflicts, when mutually agreed. Items may not be revised, exposed items relocated or items run exposed when not intended without approval. No changes shall be made in any structural members or architectural features which affect the

function or aesthetics of the buildings. If conflicts or interferences cannot be satisfactorily resolved, the Architect shall be notified and his decision obtained.

- 1.22 After final composite drawings have been accepted and approved, the Sheetmetal Subcontractor shall print one (1) color copy to be signed by all subcontractors. The Sheetmetal Subcontractor shall provide and distribute two (2) prints to each of the subcontractors, and two (2) set of prints for submittal purposes to the Construction Manager. Subcontractors requiring further prints for their own distribution go to Building Blok to download. The original signed off drawing shall be sent to the Construction Manager for permanent possession.
- 1.23 The record copies of final composite drawings shall be retained by each subcontractor as a working reference. All shop drawings, prior to their submittal to the Construction Manager shall be compared with the composite drawings and developed accordingly by the subcontractor responsible. Any revisions to the composite drawings, which may become necessary during the process of the work, shall be noted by all subcontractors and shall be neatly and accurately recorded on the record copies. Each subcontractor shall be responsible for the up-to-date maintenance of his own record copies of the composite drawings and to keep one (1) copy available at the site. The composite drawings and any subsequent changes thereto shall be utilized by each subcontractor in its development of the as-built drawings. Note: the coordination drawings may be used as "As-builts" (with appropriate changes and changing to title block).

2. COORDINATION FOR ELECTRICAL AND CONTROLS

- 2.1 The Electrical Subcontractor and the ATC Subcontractor will prepare coordinated floor plan drawings of electrical, control devices and panel locations on architectural floor plans using 3D modeling software. All devices and panels shall be indicated on these plans with indication of the location from nearest end wall or column and the mounting height from finished floor.
- 2.2 The Electrical Subcontractor and ATC Subcontractor will prepare coordinated electrical and special systems room drawings indicating all electrical, ATC , fire alarm, security, nurse call and telecommunications panels, equipment and devices using a 3D modeling software.
- 2.3 Devices indicated on the plans shall include but not be limited to receptacles, switches, emergency power off switches, dimmers, sensors, wall mounted exit lights, fire alarm horns and strobes, fire alarm pull stations, security devices, nurse call, thermostats, humidistats, tele/data outlets and all special systems.
- 2.4 Panels indicated on the plans shall include but not be limited to lighting, power, receptacles, BAS/ATC, security and fire alarm.

- 2.5 Plans shall show the necessary clearances in front of each panel as required by electrical codes.
- 2.6 The Carpentry Subcontractor shall review these plans and coordinate the spacing of wall studs and location of blocking to allow for the installation of the devices and panels per these coordinated drawings.
- 2.7 Failure to properly perform this coordination may require the relocation of the devices after they are installed. The subcontractor will be responsible for all relocation costs incurred which may involve but no limited to reframing work, drywall repairs and repainting.

3. COORDINATED SLEEVE DRAWINGS

- 3.1 The Sheetmetal, Plumbing, Mechanical, Fire Protection, Electrical and ATC Contractors will prepare coordinated floor and wall sleeve opening drawings for review by the Structural Engineer.
- 3.2 The above work will be for foundation walls and slabs only.
- 3.3 Coordinated drawings shall differentiate between those openings that are already indicated on the contract drawings, openings that will be sleeved prior to the floor or wall being poured and those openings that will be core-drilled.

END OF SECTION

SECTION 01 31 19 – PRE-INSTALLATION MEETINGS

1. PRE-INSTALLATION MEETINGS

1.1 An on-site pre-installation meeting will be held at least two weeks prior to commencement of installation of work.

2. ATTENDANCE

2.1 Attendance at the pre-installation meeting is mandatory of each Contractor and/or major supplier as required for each specific meeting listed below.

2.2 The following individuals shall attend these meetings:

- Contractors' Project Manager
- Contractors' Field Superintendent
- Contractors' Safety Representative (as needed)
- Key Subcontractors, Suppliers, and Vendors
- EDiS Project Manager
- EDiS Field Manager
- EDiS Safety Director (as needed)
- EDiS MEP Specialist (as needed)
- Owner's Representative (as needed)
- Architect/Engineer (as needed)
- Governmental Agency Representatives (as needed)
- Testing/Inspection Agency Representatives (as needed)
- Utility Company Representatives (as needed)

3. SUBMITTALS

3.1 Each contractor is responsible to have all submittals and mock-ups, as related to the pre-installation meeting scope of work, submitted and approved prior to commencement of the pre-installation meeting.

4. LIST OF REQUIRED MEETINGS

- Sitework – Erosion and Sediment Control
- Sitework
 - Bulk Grading
 - Asphalt Paving
 - Concrete Curbs, Gutters, & Sidewalks
- Landscaping
- Site Utilities
- Foundations & Concrete Slabs
- Underslab Utilities
- Structural Steel Erection & Miscellaneous Metals OSHA mandated Safety Meeting
- Roofing OSHA mandated Safety Meeting

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- Building Envelope
 - Exterior Structural Stud Assembly
 - Masonry & Stone
 - Curtain Wall/Glazing/Storefronts
- Doors/Frames/Hardware
- Interior Glass and Glazing
- Finish Carpentry & Millwork
- Acoustical Ceilings/Acoustical Wall Panels
- Paint and VWC
- Flooring (VCT, Carpet)
- Terrazzo Flooring
- Hydraulic Elevators
- Kitchen Equipment
- Athletic Courts and Equipment
- Partition Walls
 - Metal Studs
 - Drywall
 - Insulation
 - Doors/Frames/Hardware
- Loading Dock Equipment
- Hydraulic Elevators
- Fire Protection
 - Fire Sprinkler Systems
 - Fire Alarm Systems
 - Ansul System
- MEP Coordination
 - Mechanical Piping Roughin
 - Plumbing Roughin
 - Insulation
 - Electrical Roughin
 - Electrical – Bonding, grounding, lightning protection
 - Automatic Temperature Controls
 - Commissioning
- Voice/Data Low Voltage Wiring
- Security System
- Audio-Visual Equipment
- Owner Furnished Equipment
- Final Cleaning

5. AGENDA

- 3.1 At a minimum, the Contractor shall be prepared to discuss the items as listed on the agenda template shown on the following page:

F. REVIEW SUBMITTALS (SEE THE SUBMITTAL REGISTER)

G. REVIEW MATERIALS AND DELIVERIES

H. JOB SITE SAFETY (SEE THE CONTRACTOR'S SAFETY PROGRAM OR OSHA)

- Safety Plans must be submitted before the start of work
- Certificates of Insurance need to be submitted before the start of work
- Minimum PPE – Hardhats, steel toe boots, safety glasses
- Lock-out, Tag, Test and Try ALL utilities is critical before the start of demolition
- Signage & HAZCOM Requirements
- Potential Hazards
 - Excavations >4 ft
 - Slips/trips/falls
 - Existing utilities to remain and protected
 - Overhead debris
 - Power tools
 - Heavy equipment

I. COORDINATION WITH OTHER TRADES

J. ACTION ITEMS AND RESPONSIBILITY

END OF SECTION

SECTION 01 31 25 – WEB-BASED PROJECT MANAGEMENT SYSTEM

1. GENERAL PROVISIONS

- 1.1 The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- 1.2 Refer to provisions in AIA Document A201 – 2007 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, for requirements in addition to those specified in Division 1.
- 1.3 Refer to Scope Information Sheets for all contracts bound in the Project Manual under Section 011100 - SUMMARY OF WORK. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- 1.4 All Contractors shall use Internet/Web-based project management software to transmit documents, track, and otherwise manage this project.
- 1.5 Use of this project management software will not change any contractual responsibilities of the construction team members.

2. DEFINITIONS

- 2.1 System: A real time web-based software that shares data, translates data, organizes data, facilitates communication, archives actions, and offers scheduling prompts to identified Users.
- 2.2 Users: Authorized participants of this project furnished with a unique password and authorized to access the system to view/input/export data. Owner, Construction Manager, Architect, and the Contractors are all Users. Other Users may be added as necessary.
- 2.3 Contacts: Entities identified to automatically receive specific transmissions or entities selected to receive specific information sent by the system through to an e-mail address.
- 2.4 Signees: Those individuals identified, by the Contractors, authorized to sign change orders and payment applications via electronic signature. This electronic signature is as contractually binding as an original signature on paper.

3. USE OF SYSTEM

- 3.1 The use of the system is mandatory for the documentation of the transmittal of all non-oral information, even if the actual transmission of the information is by another means.
- 3.2 The use of the system will be mandatory by the Contractors to send, retrieve, and respond to data.

3.3 In addition to this web-based project management system, the Contractors will be required to use electronic mail (email) for day-to-day communication and correspondence. Email will be the primary means of transmitting written communication (i.e. meeting minutes, draft pay applications, etc.).

4. QUALITY ASSURANCE

4.1 A three hour training session in the use of the software for this project will be offered by the Construction Manager at a location convenient to the project site. Attendance by one member of each Contractor's organization is mandatory. Additional attendees may enroll based on availability of training space. All attendees must have a working knowledge of computers. Training can not begin until three working days after the receipt of the submittals indicated below.

4.2 Technical assistance will be provided by on-line help, email, or telephone for all Users throughout the life of the project.

5. SUBMITTALS

5.1 Submit to the Construction Manager, within 5 days following the receipt of the letter of intent to award, in an electronic template, the following:

- a. Electronic logo of organization (as needed)
- b. Names, mailing address and electronic address of its Users and Contacts.
- c. Designation the role/responsibility for each User

6. SOFTWARE AND HARDWARE REQUIREMENTS

6.1 Each User shall provide and maintain a computer with high speed internet access and an email address. The computer shall have a high speed internet browser (Internet Explorer 8.0 or higher, Firefox version 3.6.12 or higher, Google Chrome or Safari version 5.0 or higher) and a high speed cable Internet access, high speed DSL or T1 line.

6.2 License(s) to Use System - Each Contractor will be provided unlimited licenses to use the system for this project. Each license will allow secure unlimited usage from the notice to proceed until the original contract completion date.

7. SYSTEM DESCRIPTION

7.1 The web based project management system is a "secure, real-time, interactive, centralized database" specifically established and maintained for the management of this construction project. The product is designed to facilitate communication and improve the time management of its users by facilitating the sharing of information. Information will be available 24/7, from any computer meeting the specifications listed above. The information is fully protected. The

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electronic platform allows information to be transmitted across the internet reducing printing and postage costs and the time associated with such activities.

- 7.2 The system contains a directory of the project participants.
- 7.3 The system includes templates, with the CM's letterhead, for each document created inside the system. The template allows the use of "pull down" menus to complete significant portions of each document.
- 7.4 The system allows the templates (and attached documents created outside the system) to be distributed to Users and Contacts.
- 7.5 The System contains "translation software" to permit the viewing (and marking) of documents created outside the system. The system can view documents created by different software programs and can deliver images of its translation to any computer meeting the criteria listed above.
- 7.6 The system can be personalized by the Construction Manager to automatically send e-mail notices upon issuance of certain documents if such a practice facilitates the User's business needs.
- 7.7 The system is the product of Building Blok, LLC (www.buildingblok.com) and will be continuously updated.
- 7.8 The Construction Manager will administer the Building Blok User accounts for this project.

8. DOCUMENTS CREATED INSIDE THE SYSTEM

- 8.1 The following documents shall be created on templates inside the system.
 - a. Transmittals for submittals processed in the system. The transmittals are automatically created by the system when the submittal is uploaded.
 - b. Submittal Register showing all of the submittals required of the contract, assigned to each Contractor.
 - c. Submittal Log: The CM will maintain submittal log after it is initialized.
 - d. RFI (Requests for Information)
 - e. Change Orders
 - f. RFP (Requests for Proposal)
 - g. ASI (Architect's Supplemental Instructions)
 - h. Tasks & Memos as determined by the CM
 - i. Payment Applications
 - j. Closeout Tracking Log
- 8.2 The following documents may, at each Users option, be created on the system.
 - a. Morning & Afternoon Activity Reports generated by the system
 - b. E-mails: Contacts that do not have access to the system may be sent information from the system, by the system.

- c. Reports of information on the system
- d. Project Notices: "Broadcast" messages can be sent to other Users system entry screen.

9. DOCUMENTS CREATED OUTSIDE THE SYSTEM AND DISTRIBUTED BY THE SYSTEM

9.1 The following documents are expected to be created outside the system and distributed through the system. The actual documents may be scanned or electronically attached to the transmittal.

- a. Technical Submittals: Shop drawings, product data, testing reports, certifications, installation instructions, operation & maintenance manuals, will be submitted and distributed through the system. The Architect will return all submissions through the system electronically. The Construction Manager will distribute submittals (after Architect's action) electronically. Contractors may download and distribute submittals to their subcontractors and suppliers or elect to print paper copies for distribution, or both.
- b. Photographs: Digital photographs and scanned images can be loaded onto the system and shared.
- d. Schedule of Values/ Payment Applications: (The "pencil" review of these documents can occur inside the system).
- e. Change Orders: (The "pencil" review of these documents can occur inside the system.)
- g. Schedules: The schedule document(s) will be available for review on the system.
- h. Data created in other software may be uploaded to the system electronically.

10. DOCUMENTS CREATED OUTSIDE THE SYSTEM AND DISTRIBUTED OUTSIDE THE SYSTEM

10.1 The following documents are expected to be created outside the system and distributed outside the system. The actual documents may be scanned or electronically attached to the transmittal.

- a. Schedules: The Construction Manager will develop the Master Schedule through Microsoft Project 2003. The schedule will be distributed either through hard copies at meetings or through email.
- b. Product samples, color samples, physical samples are still required to be provided per the technical specifications, however, the transmittal documenting the distribution shall be done inside the system and submitted electronically and printed to accompany the actual submission.
- c. Meeting minutes will be created using Microsoft Word 2003 and distributed through hard copies at meetings or through email.
- d. AIA closeout documents, which require an "original" signature, will be created and distributed outside the system.

END OF SECTION

SECTION 01 32 16 - CONSTRUCTION SCHEDULE

1. PRE-BID CONSTRUCTION SCHEDULE

- 1.1 Time is a critical element of this Project. By entering a bid, the Contractor agrees to adhere to the intermediate Milestone Dates and Dates of Substantial and Final Completion established herein. The Contractor also understands that all work must be performed in an orderly and closely coordinated sequence in order to achieve the specified Milestones and Completion Dates, and the Contractor hereby agrees to perform his work in conformance with the Pre-Bid Construction Schedule established herein, or with the then current and approved Project Construction Schedule as amended from time to time by the Construction Manager.
- 1.2 The Pre-Bid Construction Schedule includes allowances for time lost due to adverse and abnormal weather conditions, other than floods, hurricanes, tornadoes, lightning and other like acts of God. The Contractor understands and agrees that it shall not be entitled to any extensions of the Contract Time or adjustment to the Contract Sum, except as allowed in the General Conditions of the Contract for Construction. The Contractor further acknowledges that the Work may be required to be performed during the winter season, that conditions during this season may be adverse and abnormal, but that such conditions will not be the basis for an extension of the Contract Time or adjustment to the Contract Sum.

2. SCHEDULING OF THE WORK AFTER AWARD OF CONTRACT

- 2.1 After award of Contract, or issuance of a Notice to Proceed, the Contractor will meet with the Construction Manager to review the Pre-Bid Construction Schedule, and the overall project plan for construction. Following the above review the Contractor will meet with each subcontractor and supplier to view the detailed plans for performing his Work. Following these meetings and within fourteen (14) days after award of the Contract or issuance of a Notice to Proceed, the Contractor shall prepare and submit for the Construction Manager's approval a Work Schedule providing for the expeditious, timely and practical execution of the Work. The Contractor's Work Schedule shall include activity descriptions and durations for shop drawings, fabrication, delivery and installation. If the Construction Manager so requests, the Contractor shall provide adequate explanation regarding crew sizes, production rates and similar data used to arrive at the durations and sequences.
- 2.2 The Construction Manager shall review the Contractor's Work Schedule, coordinate it with the separate work by other contractors, the Owner and the Construction Manager, and after coordination, shall incorporate it into the approved Project Construction Schedule. The approved Project Construction Schedule shall be issued to the Contractor and the Contractor shall perform his Work in conformity therewith.
- 2.3 The Contractor shall submit proposed schedule revisions and obtain the written

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approval of the Construction Manager therefore before deviating from the Project Construction Schedule.

2.4 The Construction Manager will incorporate approved schedule revisions into the Project Construction Schedule, and shall otherwise update and revise the Project Construction Schedule as the Construction Manager, at his sole discretion, deems necessary.

2.5 Project schedule attached.

3. ADHERENCE TO THE SCHEDULE

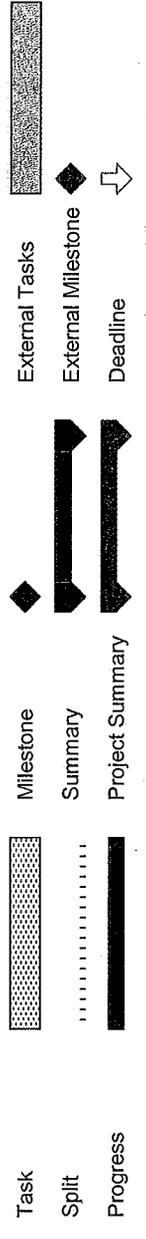
3.1 The Contractor shall start each part of its Work on the date designated for start in the approved Project Construction Schedule unless advised by the Construction Manager. The Contractor shall carry the Work forward expeditiously with adequate forces, equipment and materials, and shall complete each part of his work on or before the date designated in the approved Project Construction Schedule.

3.2 If the Construction Manager determines that the Contractor is behind schedule, the Construction Manager shall have the right to require that the Contractor take steps, at the Contractor's expense, to accelerate its Work. Such steps shall include increases in manpower, equipment and materials and/or overtime as the Construction Manager may deem necessary. If the Contractor fails to comply with the Construction Manager's instructions relating to improved rate of progress, the Contractor may be held in default under the appropriate provisions of the General Conditions of the Contract.

3.3 Each Contractor shall, if directed by the Construction Manager, provide the Construction Manager a 2-week look ahead of anticipated manpower showing the number of men, classification, and anticipated work.

END OF SECTION

ID	Task Name	Duration	Start	Finish	1st Quarter Dec Jan	2nd Quarter Apr May Jun	3rd Quarter Jul Aug Sep	4th Quarter Oct Nov Dec	1st Quarter Jan Feb Mar	2nd Qu Apr May
1	Project Start	315 days	Wed 1/16/13	Tue 4/1/14						
2	Award Contracts	1 day	Wed 1/16/13	Wed 1/16/13						
3	Submittals / Shop Drawings	15 days	Thu 1/17/13	Wed 2/6/13						
4	Review Shops & Precure Materials	20 days	Thu 2/7/13	Wed 3/6/13						
5	Start Construction	1 day	Thu 2/21/13	Thu 2/21/13						
6	Install UG electric to Geo-Thermal Vaults	20 days	Fri 2/22/13	Thu 3/21/13						
7	Construct Out Buildings	275 days	Tue 3/12/13	Mon 3/31/14						
8	Site, paving, Stadiums & Fields	275 days	Tue 3/12/13	Mon 3/31/14						
9	Project Substantially Complete	1 day	Tue 4/1/14	Tue 4/1/14						



Project: BPG Bid Schedule
Date: Thu 11/8/12

SECTION 01 32 19 - SUBMITTAL REGISTER

1. SUBMITTALS/SUBMITTAL REGISTER

- 1.1 The Contractor shall submit all items listed or specified within the sections of the Specifications included in its Work. Submittals shall include such items as: contractor's, manufacturer's or fabricator's drawings; descriptive literature including, but not limited to, catalog cuts, diagrams, operation charts or curves; test reports; samples, operations and maintenance manuals, including parts lists; certifications; warranties and other required submittals. Submittals pertinent to materials and equipment which are subject to advance approval shall be scheduled and made prior to the acquisition or the delivery thereof.
- 1.2 The Contractor shall carefully control procurement operations to assure that each individual submittal is made on or before the dates required for timely performance of its Work.
- 1.3 Within seven (7) days after award of Contract or issuance of Notice to Proceed, the Contractor shall execute and submit to the Construction Manager; An electronic Excel format document identifying the complete submittal register for future project submittals. The register shall contain a list of each item of equipment and material of each type for which fabricator's drawings and/or related descriptive data, test reports, samples, spare parts, operation and maintenance manuals, or other types of submittals required by the Specifications. The order of listing of items on the Register shall conform to the sequence of the items as they occur within the divisions. Drawings of component items forming a system or that are interrelated shall be scheduled to be correlated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time shall be allowed for review and approval and possible resubmittal of any item subject to approval, because no delay damages or time extensions will be allowed for time lost in late submittals or resubmittals. The Construction Manager and Architect/Engineer will review the Submittal Register for approval action. The approved Register will become a part of the Contract and Contractor will be subject to requirements thereof. The Contractor shall revise and/or update the Register monthly to take into account all changes in the Contract. Each such revised edition and/or revision to the Register shall be resubmitted to the Construction Manager. This Register shall be coordinated with related submittals of other Contractors.

2. SAMPLES

- 2.1 Submit tagged or labeled samples in triplicate, unless another quantity is otherwise specified by the Construction Manager.
- 2.2 Tags or labels shall be securely affixed and contain as a minimum the following information: Project Name, Contractor's Name, Contract Title and Number, Date, Transmittal Number, Product Manufacturer's or Fabricator's Name and Product Identifier.

END OF SECTION

SECTION 013226 - SUBCONTRACTOR DAILY REPORTS

1. SUBCONTRACTOR DAILY REPORTS

1.1 The Subcontractor shall submit a Daily Report to the Construction Manager on the forms provided covering the following subjects:

1. Work in Progress, including areas where work is being performed, nature of the operations in progress, and the manpower assigned.
2. Extra Work (Time and Material) in progress.
3. Materials Received.
4. Trade labor breakdown including identification of all workers on site and the number of hours (or portions thereof) worked by each.
5. *Inspection Checklist (performed daily).*

1.2 The Subcontractor shall submit the Daily Report to the Construction Manager by 9:00 AM on the next workday following the workday covered in the Daily Report.

2. DAILY EXTRA WORK REPORT

2.1 The Subcontractor shall submit on the form provided a Daily Extra Work Report on each day he performs authorized Extra Work on a time and material basis.

2.2 A separate Daily Extra Work Report shall be submitted for each separate authorized Extra Work item done on a time and material basis.

2.3 The Subcontractor shall submit his Daily Extra Work Report as an attachment to his Daily Report by 9:00 AM on the next workday following the workday covered in the Daily Extra Work Report.

3. Sample Daily Report

3.1 A sample daily report follows this section for your reference.

END OF SECTION



CONTRACTOR'S DAILY REPORT

Project Name: _____

Date: _____

Contractor: _____

Contract No. & Description: _____

Weather: _____

Foreman's Name (Print) _____

TRADE	*CLASS	MANPOWER COUNT	TOTAL MAN HOURS	TODAY'S DESCRIPTION / LOCATION OF WORK
TOTAL				

* INDICATE: F = FOREMAN; J = JOURNEYMAN; A = APPRENTICE

Work Status/Work Planned: _____

Construction Equipment: _____

Qualified Operator(s) _____

Deliveries or Materials: _____

Machinery, tools, material, and equipment to be used: _____

Inspection of work area, machinery, tools, material, or equipment _____

The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement is prohibited. Such machine, tool, material or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

Please See Other Side

Below is a general checklist of requirements on this project. Contractors will check off items that pertain to their contract and project tasks. Notify EDis Field Manager of any issues. This checklist is not meant to be all inclusive. Please refer to additional OSHA regulations for compliance.

House Keeping

- Material Storage Area's Orderly
- Trash Containers Available and Emptied daily
- Fire Hazards
- Lighting and ventilation
- Exits and Stair clear passage
- Walkways, corridors clear passage
- Daily debris /trash removal
- _____

Personal Protective Equipment

- Hard Hats being worn
- Safety Glasses with side shields being worn
- Secondary Eye/Face protection
- Respirators as required
- Hand protection when needed
- Ear protection when needed
- Inspected & Maintained
- _____

Fire Prevention

- Fire extinguishers inspected
- Flammable / Combustibles properly store
- Approved Fuel cans used and labeled
- Oxygen / Acetylenes stored properly
- _____

Electrical

- GFI in use
- Three prong insulated extension cords used
- Extension cords in good condition
- Lockout / Tag-out program in use
- _____

Excavations

- Miss Utility been contacted
- Properly Barricaded
- Ladders in use at depths over 4'-0"
- Ladders every 25'-0" distance
- Shored, sloped, benched as required
- Dewatering as needed
- _____

Ladders

- Good condition
- Correct pitch
- Extends 3'-0" above landing
- Open and secured / tied off
- _____

Scaffolds

- Certified Scaffold Installer
- Guardrails, toe boards, and planking secured
- Appropriate signage
- Adequate cross bracing
- Secured to building over 25'-0" in height
- _____

Cranes

- Rated Load Capacity available in cab
- Swing Radius barricaded
- Appropriate certificates / decals / hand signals
- Daily safety inspection log completed
- _____

Fall Protection

- Fall protection plan on file
- Full harness / shock absorbing lanyard used
- Anchoring points secured
- Perimeter barricades
- Open sided floor protection
- 6'-0" Tie-off utilized
- _____

Paperwork

- MSDS Information
- Contractors Safety Program
- Hazardous Communications Training
- Hazardous Communications Program
- Contractor Qualified Representation
- _____

Other

- _____
- _____

Foreman / Competent Person:

Print Name _____

SECTION 01 33 00 – SUBMITTAL PROCEDURES

1. GENERAL PROVISIONS

1.1 The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

2. ITEMS TO BE SUBMITTED AT START OF WORK

2.1 Performance/Labor and Material Payment Bond(s): One (1) copy of each bond simultaneously with the signed Agreement. See General Conditions Article 11.4 and Supplementary Conditions.

2.2 Policies or Certificates of Insurance: Two (2) copies simultaneously with the signed Agreement. See General Conditions Article 11 and Supplementary Conditions.

2.3 Contractor's License: Submit a copy of all business licenses required by local and state agencies.

2.4 Contractor's Schedule of Values: Submit for approval within 21 days after the Agreement is signed through the Building Blok Management Program.

2.5 Contractor's Progress Schedule: Two (2) copies for review and reference within 21 days after the Agreement is signed. See General Conditions Article 3.10 and provisions in this Section.

2.6 Submittal Schedule: In Excel electronic format within 21 days after the Agreement is signed. See provisions in this Section.

2.7 Products List: In Excel format for approval within 30 days after the Agreement is signed. See provisions in Section 016200 - MATERIAL AND EQUIPMENT.

3. NON-RESIDENT CONTRACTOR & SUBCONTRACTORS BONDS

3.1 Refer to requirements in Section 011100 - INSTRUCTIONS TO BIDDERS for filing of Surety Bonds with the Division of Revenue.

3.2 If such bonds are required on this project, it will be the responsibility of the Contractor to produce evidence to the Construction Manager that they have been filed, or if not required, to supply a notarized statement that they are not required. This must be done within seven (7) days after award of Contract and in any event before construction starts.

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4. RELATED REQUIREMENTS

4.1 See Section 017700 - CONTRACT CLOSE OUT: for submittal requirements for Contract Close out.

5. SUBMITTALS

5.1 All submittals shall be directed to the Construction Manager utilizing the Building Blok Management System.

5.2 Prepare a Submittal's Schedule in Excel electronic format for Shop Drawings, Product Data and Samples. Show:

1. The dates for Contractor's submittals.
2. The dates submittals will be required for Owner-furnished products.
3. The date approved submittals will be required from the Architect.

5.3 Should the Architect or Construction Manager elect to omit any items from the list of items to be reviewed, it shall not relieve the Contractor from compliance with the Contract Documents with regard to that item. In such instance, the Contractor may still elect to have submittals prepared for his own use without review by the Architect or Construction Manager.

6. SHOP DRAWINGS

6.1 Conform to provisions in General Conditions applying to Shop Drawings.

6.2 Present in a clear and thorough manner.

1. Identify details by reference to sheet and details, schedule or room numbers shown on Contract Drawings.
2. Submit through the Building Blok Management System.

7. PRODUCT DATA

7.1 Conform to provisions in General Conditions applying to Product Data.

7.2 Preparation:

1. Clearly mark each copy to specifically identify products or models pertinent to project.

2. Show performance characteristics and capacities.
3. Submit through the Building Blok Management System.
4. Show dimensions and clearances required.
5. Show wiring or piping diagrams and controls.

7.3 Manufacturer's standard schematic drawings and diagrams:

1. Modify drawings and diagrams to delete information which is not applicable to the Work.
2. Supplement standard information to provide information specifically applicable to the Work.

8. SAMPLES

8.1 Conform to provisions in General Conditions applying to Samples.

8.2 Provide samples of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the project, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.
3. Submit through the Building Blok Management System.

8.3 Field samples and mock-ups; See requirements, if any, in other specification Sections.

9. SUBMITTAL REQUIREMENTS

9.1 Make submittals promptly through the Building Blok System in accordance with published schedule, and in such sequence as to cause no delay in the Work or in the Work of any other contractor.

9.2 Number of submittals required.

1. Shop drawings and Product Data: All submittals through the Building Blok Management System, shop drawings for temporary steel, steel and miscellaneous steel, MEP shop drawings shall also provide one (1) paper copy for approval and ultimate use by the Construction manager for field verification. Any additional copies required by the Contractor shall be made by him.

2. Samples: Submit four (4) each. Submit all data and pictures of samples through the Building Blok Management System. Physical samples to be noted on Building Blok submittal and supplied to Construction manager for processing. When approved it will be returned to the Construction Manager to be retained at the site for reference use.

9.3 Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and number.
3. Contract identification.
4. The names of the Contractor, Supplier and Manufacturer.
5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the Work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8 inch x 3 inch blank space for Contractor and Architect's stamps.
12. Contractor's stamp, initialed or signed, certifying review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents. Submittals which have not been stamped with this stamp or its approved equivalent will be returned without being reviewed.

- 9.4 Shop Drawing coordination and interface with work of other Contracts and adjacent work is the responsibility of each individual Contractor.

10. RESUBMISSION REQUIREMENTS

- 10.1 Make any corrections or changes in the submittals required by the Architect and

resubmit until approved.

10.2 Shop drawings and Product Data:

1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those requested by the Architect.

10.3 Samples: Submit new samples as required for initial submittal.

11. FINAL DISTRIBUTION OF APPROVED SUBMITTALS

11.1 The Construction Manager will distribute copies of Shop Drawings and Product Data which carry the Architect's stamp through Building Blok to:

1. Contractor that made submittal.
2. Jobsite File.
3. Record Document File.
4. Other Contractors, as required for coordination.

11.2 The Construction Manager will distribute samples as required.

11.3 The Contractor will distribute copies of Shop Drawings and Product Data which carry the Architect's stamp to:

1. Subcontractors.
2. Suppliers.
3. Fabricators.

12. SCHEDULE OF VALUES

12.1 Use AIA Document G703, Continuation Sheet to G702. As formatted on the Building Blok Management System.

13. PROGRESS SCHEDULE

13.1 Prepare schedules in the form of a horizontal bar chart.

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1. Provide separate horizontal bar chart for each trade or operation.
 2. Horizontal time scale: Identify the first work day of each week.
 3. Scale and spacing: To allow space for notations and future revisions.
 4. Minimum sheet size 11 inches by 17 inches.
- 13.2 Format of listings: The chronological order of the start of each item of work.
- 13.3 Show the complete sequence of construction by activity.
- 13.4 Show the dates for the beginning, and completion of, each major element of construction such as:
1. Site clearing.
 2. Site utilities.
 3. Foundation work.
 4. Structural framing.
 5. Subcontractor work.
 6. Equipment installation.
- 13.5 Show projected percentage of completion for each item as of the first day of each month.
- 13.6 Update Progress Schedule monthly and submit with Application for Payment and Schedule of values.
- 13.7 Indicate progress of each activity to date of submission.
- 13.8 Show changes occurring since previous submission of schedule:
1. Major changes in scope.
 2. Activities modified since previous submission.
 3. Revised projections of progress and completion.
 4. Other identifiable changes.

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- 13.9 Provide a narrative report as needed to define:
1. Problem areas, anticipated delays and the impact of the schedule.
 2. Corrective action recommended, and its effect.
 3. The effect of changes on schedules of other prime contractors.
- 13.10 Submit one reproducible transparency.
- 13.11 After review, distribute copies of the schedule to:
1. Jobsite File.
 2. Subcontractors.
 3. Architect.
 4. Owner.
- 13.12 Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

END OF SECTION

SECTION 01 35 00 – CONTRACTOR EMPLOYEE BACKGROUND CHECK

1. It is the contractor's responsibility to perform background checks and screen all employees working onsite. The background check must include checking for a previous history of Child Abuse Convictions, Child Molestation Convictions, Felony Convictions, and Drug Convictions within the last 5 years. Any employee with any of these convictions may not enter the job site or school campus. This background check must be completed and screened by the contractor prior to an employee entering the job site. The Construction Manager, The Owner's representative and the Owner have the right to request that the screening data be submitted on a case by case basis.

END OF SECTION

CONTRACTOR

COMPETENT / QUALIFIED PERSON DESIGNATION LOG

Project:

Field Manager:

Contract: Contractor:	Applicable to Subcontractor (yes / no)		Foreman	Competent Person (if not foreman)
Subpart C-General Provisions				
1926-20 General Safety				
Subpart D - Health and Environmental Controls				
1926-53 Ionizing Radiation				
1926-55 Gases, Vapors, Fumes, Dusts, Mists				
1926-57 Ventilation				
1926.59 Hazard Communication				
1926.62 Lead				
Subpart E - Personal Protective Equipment				
1926.101 Hearing				
1926.103 Respirator Protection				
Subpart H - Materials Handling, Storage				
1926.251 Rigging Equipment for Material Handling				
Subpart J - Welding and Cutting				
1926.354 Welding, Cutting and Heating				
Subpart K - Electrical				
1926.404 Wiring Design and Protection				
Subpart L - Scaffolding				
1926.451 Scaffolding				
Subpart M - Fall Protection				
1926.502 Fall Protection Criteria and Practices				
1926.503 Training				
Subpart N - Cranes, Derrick -Redesignated 1926.1501				
Subpart O - Motor Vehicles and Equipment				
1926.601 Motor Vehicles				
Subpart P - Excavations				
1926.651 Specific Excavation Requirements				
1926.652 Requirements to Protective Systems				
Subpart S - Tunnels, Shafts, Caissons				
1926.800 Tunnels, Shafts, Caissons				
1926.803 Compressed Air				
Subpart T - Demolition				
1926.850 Preparatory Operations				
1926.852 Chutes				
1926.859 Mechanical Demolition				
Subpart V - Power Transmission and Distribution				
1926.955 Overhead Lines				

Contract: Contractor:	Applicable to Subcontractor (yes / no)		Foreman	Competent Person (if not foreman)
Subpart X - Stairways and Ladders				
1926.1053 Ladders				
1926.1060 Training Requirements				
Subpart Z - Toxic and Hazardous Substances				
1926.1101 Asbestos				
1926.1101 thru 1926.1148 Toxic and Hazardous Substances				

I certify that the listed employees are competent persons, as defined and required by specific OSHA standards. They are capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Name (print)

Contractor Signature

Date

Certification of Training Documents to be Submitted with Safety Policy/Program

Provide a certification of training for employees on your safety program.

In addition, Contractor shall provide certification of training on the following programs, as they pertain to your contract and project tasks. Certification of training must include: Employee's name, date of training, person conducting the training, topics covered, and a statement that the student has successfully completed the course. This list is not meant to be all inclusive: please refer to OSHA regulations for applicable safety requirements.

- a. Scaffold: 1926.454
- b. Fall Protection 1926.503
- c. Crane Operator: 1926.1427
- d. Signal person (this is for any persons connecting material or equipment for lifting):
1926.1428
- e. Crane maintenance: 1926.1429
- f. Steel erection fall protection: 1926.761
- g. Respiratory protection (medical clearance and training records complying with 1910.134
- h. Powder-actuated tools: 1926.302
- i. Motor Vehicles (are those vehicles that operate within an off-highway jobsite, not open to public traffic): 1926.21

SECTION 01 35 23 - SAFETY PROGRAM

1. GENERAL

- 1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety activities and programs in connection with the Work.
- 1.2 Contractor shall be responsible for the safety of its personnel.
- 1.3 Hard hats and safety glasses must be worn by all personnel on the jobsite, except in contractor's administrative office/trailer. All equipment must comply with OSHA standards. All job site personnel shall wear long pants, shirts (no tank tops) and work boots.

2. SAFETY PROGRAM

- 2.1 Prior to commencing the Work, the Contractor shall submit to the Construction Manager (1) electronic copy and (1) bound copy of its safety program and one (1) copy of MSDS information in a 2" ringed notebook. One paper copy of the safety program and MSDS will be retained by the Construction Manager in the field office.
- 2.2 The safety program shall outline those hazards peculiar to the Contractor's Work, and the steps to be taken to eliminate or reduce the risk of injury or loss due to those hazards. **The program shall be site specific.** Contractor shall implement and enforce its safety program, which is in accordance with all OSHA, Federal, State and local laws.
- 2.3 Contractor shall designate a qualified Safety Supervisor to implement the safety program. Unless otherwise approved by the Construction Manager, the Safety Supervisor shall be the Contractor's field Superintendent/Foremen.
- 2.4 Prior to starting work on-site, the Contractor shall arrange with the on-site Field Manager to have their employees complete the EDiS Company Zero Accidents Safety Orientation program.
- 2.5 Contractor shall hold weekly safety toolbox talks with all of its employees every Monday at 12:30 PM. The Contractor shall designate a responsible, capable person to conduct these meetings. Contractor's safety supervisor or superintendent must submit to the Construction Manager weekly toolbox talks attendance sheets and the topics discussed.

3. SUBSTANCE ABUSE POLICY STATEMENT

The Construction Manager is committed to providing a safe work site environment for its employees and Contractors' employees. The Construction Manager does not condone or

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permit employees and Contractors' employees to use or be under the influence of drugs or alcohol while they are on any of the Construction Manager work sites. The Policy is as follows:

- 3.1 It is a violation of the Construction Manager's policy for employees and Contractors' employees to use, possess, sell, trade, or otherwise engage in the use of illegal drugs and alcohol.
- 3.2 It is a violation for employees and Contractors' employees to report to work while influenced by illegal drugs or alcohol.
- 3.3. It is a violation for employees and Contractors' employees to use prescription drugs illegally (i.e. to use prescription drugs that have not been legally obtained) and to use prescription drugs in a manner other than the prescribed intentions.
- 3.4 Employees and Contractors' employees who are taking medication, which is prescribed by their physician, are expected to discuss potential side effects with their prescribing physician, as it relates to the work requirements.

Violations of this policy will require disciplinary action. If any employees or Contractors' employees are observed or suspected of being influenced by drugs or alcohol, they will be instructed to stop work and may be required to leave the work site.

4. EXECUTION

- 4.1 Contractor shall comply with all applicable federal, state and local laws, regulations and orders relating to occupational safety and health, and related procedures, and shall, to the extent permitted by law, indemnify and hold Construction Manager, Owner and Architect, and their respective directors, officers, or agents and employees, harmless from any and all liability, public or private, penalties, contractual or otherwise, losses, damages, costs, attorney's fees, expenses, causes of action, claims or judgments resulting from a claim filed by anyone in connection with the aforementioned acts, or any rule, regulation or order promulgated thereunder, arising out of the Contractor's Work, this Agreement or any subcontract executed in prosecution of the Work. Contractor further agrees in the event of a claim of violation of any such laws, regulations, orders or procedures arising out of or in any way connected with the performance of this agreement, Construction Manager may immediately take whatever action is deemed necessary by Owner and/or Construction Manager to remedy the claim or violation. Any and all costs or expenses paid or incurred by Owner and/or Construction Manager in taking such action shall be borne by Contractor, and may be deducted from any payments due Contractor.
- 4.2 The Contractor agrees to (1) take all necessary steps to promote safety and health on the job site; (2) cooperate with Owner and/or Construction Manager and other

Contractors in preventing and eliminating safety and health hazards: (3) train, instruct and provide adequate supervision to ensure that its employees are aware of, and comply with, applicable Federal and State safety and health laws, standards, regulations and rules, safe healthful work practices and all applicable safety rules, regulations and work practices and procedures (4) not create any hazards or expose any of its employees, employees of the Owner and/or Construction Manager or employees of Contractors to any hazards; and (5) where the Contractor is aware of the existence of a hazard not within its control, notify the Construction Manager of the hazard as well as warn exposed persons to avoid the hazard.

- 4.3 The Contractor's Superintendent or Safety Supervisor shall immediately, verbally report, and promptly thereafter confirm in writing to the Construction Manager any unsafe conditions or practices that are observed, or violations of job safety which are not within the Contractor's control.
- 4.4 Contractors shall immediately, verbally report, and promptly thereafter confirm in writing, to the Construction Manager any unsafe practices or conditions that are observed which are not under the Contractor's control.
- 4.5 The Contractor's Superintendent or Safety Supervisor shall insure that adequate first aid supplies are available, and that personnel are qualified to administer first aid/CPR, as required by State and/or Federal regulations.
- 4.6 Contractor shall promptly notify Construction Manager of any personal injury requiring medical treatment of any of the Contractor's employees at the Project site; or of significant damage to property arising in connection with Contractor's performance, as promptly as possible after the occurrence of such injury or damage. Within twenty-four hours of such occurrence, Contractor shall furnish to Construction Manager a complete written report of such injury or damage.
- 4.7 Contractor certifies that the forgoing terms shall be made applicable to all Contractors' suppliers, materialmen or anyone furnishing labor and/or materials to the site.
- 4.8 The Contractor shall continue to educate his job Safety Supervisor or Superintendent of their responsibilities, which shall include:
 1. Instructing workers and subcontractors under its supervision in safe work practices and work methods at the time they are given work assignments.
 2. Ensuring that its workers and subcontractors have and use the proper protective equipment and suitable tools for the job.
 3. Continuously checking to see that no unsafe practices or conditions are allowed to exist on any part of his job.

4. Acquainting its workers and subcontractors with all applicable safety requirements and seeing that they are enforced.
 5. Setting a good example for his workers.
 6. Making a complete investigation of accidents to determine facts necessary to take corrective action.
 7. Promptly completing a "Supervisor's Investigation Form" with his Supervisor's assistance and distributing as required. This form will be provided by the Construction Manager.
 8. Holding weekly "tool box" safety meetings with his men to:
 - a. Discuss observed unsafe work practices or conditions including a review of current Construction Manager safety report.
 - b. Review the accident experience of his crew and discuss correction of accident causes.
 - c. Encourage safety suggestions from his men.
 9. Seeing that prompt medical treatment is administered to an injured employee.
 10. Correcting or reporting immediately to job superintendent any observed unsafe conditions, practices or violations of job security.
 11. Making all reports required by these Contract Documents to the Construction Manager in a full and timely fashion.
5. SAFETY MEETINGS
- 5.1 The Contractor's Project Manager or Superintendent shall attend weekly or biweekly supervisory job meetings. The first topic of these meetings will be job site safety. The weekly safety reports will be reviewed and violations must be corrected immediately. Contractors will be encouraged to participate in the on-going jobsite safety.
6. TOOL BOX SAFETY MEETINGS
- 6.1 The Contractor shall schedule weekly "tool box" safety sessions to be held by his job safety supervisor or superintendent for all of his employees.
 - 6.2 A member of the Contractor's management staff shall periodically attend "tool box" safety sessions to evaluate their effectiveness and offer any appropriate suggestions

for improvement.

7. REPORTS

- 7.1 Contractors shall report all accidents or injuries on a timely basis in accordance with all applicable regulations.
- 7.2 Contractors shall promptly complete an accident investigation report of all accidents.
- 7.3 A record of all "tool box" safety sessions shall be made and submitted to the Construction Manager on forms to be provided.

8. SAFETY REPRESENTATIVE

- 8.1 The Construction Manager may employ the services of a Safety Representative on the project.
- 8.2 The Safety Representative *will* visit the job site on a weekly basis to determine if the work is being performed in a safe manner and in accordance with OSHA, State and Local safety regulations. Safety representative is not responsible for observing and documenting all possible safety violations. The Contractor's Safety Representative or Superintendent shall attend job site safety inspections with the Safety Representative on a weekly basis.
- 8.3 The Safety Representative will file a written report with the Construction Manager at the end of each inspection listing the safety violations observed during the inspection.
- 8.4 The Construction Manager will distribute the Safety Representative's report to all Contractors. All safety violations must be corrected immediately.

9. RIGHT TO STOP THE WORK DUE TO SAFETY VIOLATIONS

- 9.1 The Construction Manager, in its sole discretion, may order the Contractor to stop the work due to safety violations under the following circumstances:
 - 1. If the Construction Manager observes the Contractor is violating safety regulations and the Contractor takes no immediate action to correct the violation.
 - 2. If the Contractor has been notified by the Construction Manager in writing that he is in violation of safety regulations and fails to take action to correct the violation within 24 hours of the notice.
- 9.2 If the Construction Manager directs the Contractor to stop the work due to safety violation, it will be done in accordance with the General Conditions of the Contract. Contractor shall not be permitted an adjustment of the Contract Time or Sum for the

days lost to any suspension of work.

- 9.3 If the Construction Manager or Safety Representative observes Contractor's employee violating this safety program or OSHA Standards in an habitual manner, or creating a serious life safety violation, the Construction Manager or Safety Representative may instruct the Contractor's superintendent or foreman to remove the violator from the work site for failure to comply with the safety program and the contract.

10. EMERGENCY PROCEDURES

- 10.1 The Construction Manager shall establish a central meeting location for the assembly of all Contractors' employees in the event of a major job site emergency.

- 10.2 Contractor shall assemble all of their personnel and account for all employees. Contractor must immediately report to the Project Superintendent with the status of their employees.

11. FALL PROTECTION PROCEDURES

- 11.1 Contractor is responsible, in accordance with federal, state, local laws and regulations including OSHA, to provide and enforce their own site specific fall protection program and equipment. The following fall protection procedures shall be enforced by all Contractors as a minimum standard.

All workers on walking/working surfaces with unprotected sides or edges six feet (6') or higher above the next lower level must be protected from falls by the use of guardrail systems, net systems, fall arrest systems or control access zone programs. It is intended that when fall protection is required, it is required 100% of the time. All contractors are reminded that relevant industry regulations require that contractors comply with the following standards.

1. Workers constructing or working near leading edges must be protected.
2. Workers on the face of formwork or reinforcing steel must be protected at a height of 6 feet (6') or greater.
3. Scaffolds shall be guarded at 6 feet (6') above next lower level.
4. Brick layers performing overhand bricklaying and related work six feet (6') or higher above lower levels must be protected from falls.
5. Roofers must comply with OSHA standards for roof work.
6. The Contractor's controlled access zone plan shall be included in their site-specific safety program and shall be submitted prior to the start of work.

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Contractors are responsible for assuring programs are OSHA compliant.

7. Guidelines for Residential Construction or any interpretations will not be accepted in lieu of 1926 Standards.
 8. Contractors must provide certification per OSHA CFR29 § 1926.503(b) of employee training and retraining on fall protection upon request.
- 11.2 Contractor shall provide its own fall protection. Fall protection may be provided by guardrail systems, net systems, or personal fall arrest systems. All fall protection systems must comply with OSHA standards.
- 11.3 Stepladders, exposed to shafts or edges of the building, greater than six feet (6') above the next lower level, must be tied off or otherwise secured. Employee must wear fall protection, i.e. harness/lanyard.
- 11.4 The Safety Cable System shall not be altered or removed without a written request submitted to the Project Manager with a copy to the Field Manager. It shall be the responsibility of each and every Contractor that is removing or altering the Safety Cable System to maintain the fall protection safety provided by the safety cable and not leave the area unprotected. Each and every Contractor shall be responsible to re-install the Safety Cable System immediately after work is completed. Each and every Contractor shall be responsible to re-install the Safety Cable System in accordance to OSHA standards.
- 11.5 Fall protection will be enforced for Structural Steel Erectors.
1. As for a Contractor engaged in structural steel erection, the Contractor is specifically advised that structural steel erectors shall comply with all protection requirements for all work at a height of six feet (6') or greater above the next lower level, 100 percent of the time, by any of the following means.
 - a. Standard guardrail system.
 - b. Personal Fall Arrest System (PFAS) – full body harness with shock absorbing lanyard. Maximum free fall distance permitted, with lanyard and lanyard attachment shall not exceed six feet (6'). Anchor point must be capable of supporting five thousand pounds. Perimeter guard cables or alignment cables may not be used for anchor points.
 - c. Access to work area shall be provided by ladders. There shall be sufficient number of ladders available to reduce the amount of "beam walking." When it is absolutely necessary to traverse a beam, 100% fall protection must be utilized.

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- d. Steel erection Contractors must, at all times, be able to certify in writing that each of his employees has been properly trained in both OSHA fall protection standards and the Contractor's site specific project fall protection procedures.
- e. Prior to the erection of the steel, the Contractor shall meet with the Project Manager and Safety Representatives to review and document site specific procedures.

END OF SECTION

SECTION 013523 - SAFETY PROGRAM

1. GENERAL

- 1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety activities and programs in connection with the Work.
- 1.2 Contractor shall be responsible for the safety of its personnel.
- 1.3 Hard hats and safety glasses must be worn by all personnel on the jobsite, except in contractor's administrative office/trailer. All equipment must comply with OSHA standards. All job site personnel shall wear long pants, shirts (no tank tops) and work boots.

2. SAFETY PROGRAM

- 2.1 Prior to commencing the Work, the Contractor shall submit to the Construction Manager (1) electronic copy and (1) bound copy of its safety program and one (1) copy of MSDS information in a 2" ringed notebook. One paper copy of the safety program and MSDS will be retained by the Construction Manager in the field office.
- 2.2 The safety program shall outline those hazards peculiar to the Contractor's Work, and the steps to be taken to eliminate or reduce the risk of injury or loss due to those hazards. **The program shall be site specific.** Contractor shall implement and enforce its safety program, which is in accordance with all OSHA, Federal, State and local laws.
- 2.3 Contractor shall designate a qualified Safety Supervisor to implement their safety program. Unless otherwise approved by the Construction Manager, the Safety Supervisor shall be the Contractor's Field Superintendent/Foremen.
- 2.4 **Contractor shall furnish the names and qualifications of the competent persons and qualified persons who may be required for their scope of work by the Contractor's safety procedures, and by federal, state and/or local regulations. Examples include competent persons and/or qualified persons for steel erection, excavation, scaffold erection, confined space entry, crane and rigging operations, annual crane inspections, fall protection including horizontal lifeline systems, etc. See the attached Competent/Qualified Person Designation Log.**
- 2.5 **Contractor shall provide written certification showing that all employees have been trained on the Contractor's Safety Program. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training and the signature of the person who conducted the training or the signature of the employer. If the employer relies on training conducted by another employer or completed prior to the effective date of this section, the certification**

record shall include the date the employer determined the prior training was adequate rather than the date of actual training. The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury. Please forward certification (document) of training for each employee on an EDiS project. The latest training certificate shall be maintained.

- 2.6 Contractor shall provide certification of training on the following programs, as they pertain to your contract and project tasks: Scaffold, Fall Protection, Crane Operator, Signal Person, Crane Maintenance, Steel Erection Fall Protection, Respiratory Protection, Powder-Actuated Tools, and Motor Vehicles. Certification of training must include: Employee's name, date of training, person conducting the training, topics covered, and a statement that the student has successfully completed the course. This list is not meant to be all inclusive; please refer to OSHA regulations for applicable safety requirements.
- 2.7 Contractor Daily Reports with Safety Inspection Checklist will be submitted daily to Field Manager, verifying inspection of work area, machinery, equipment and tools.
- 2.8 Prior to starting work on-site, the Contractor shall arrange with the on-site Field Manager to have their employees complete the EDiS Company Zero Accidents Safety Orientation program.
- 2.9 Contractor shall hold weekly safety toolbox talks with all of its employees every Monday at 12:30 PM. The Contractor shall designate a responsible, capable person to conduct these meetings. Contractor's safety supervisor or superintendent must submit to the Construction Manager weekly toolbox talks attendance sheets and the topics discussed.

3. SUBSTANCE ABUSE POLICY STATEMENT

The Construction Manager is committed to providing a safe work site environment for its employees and Contractors' employees. The Construction Manager does not condone or permit employees and Contractors' employees to use or be under the influence of drugs or alcohol while they are on any of the Construction Manager's work sites. The Policy is as follows:

- 3.1 It is a violation of the Construction Manager's policy for employees and Contractors' employees to use, possess, sell, trade, or otherwise engage in the use of illegal drugs and alcohol.
- 3.2 It is a violation for employees and Contractors' employees to report to work while influenced by illegal drugs or alcohol.

- 3.3. It is a violation for employees and Contractors' employees to use prescription drugs illegally (i.e. to use prescription drugs that have not been legally obtained) and to use prescription drugs in a manner other than the prescribed intentions.
- 3.4. Employees and Contractors' employees who are taking medication, which is prescribed by their physician, are expected to discuss potential side effects with their prescribing physician, as it relates to the work requirements.

Violations of this policy will require disciplinary action. If any employees or Contractors' employees are observed or suspected of being influenced by drugs or alcohol, they will be instructed to stop work and may be required to leave the work site.

4. EXECUTION

- 4.1 Contractor shall comply with all applicable federal, state and local laws, regulations and orders relating to occupational safety and health, and related procedures, and shall, to the extent permitted by law, indemnify and hold Construction Manager, Owner and Architect, and their respective directors, officers, or agents and employees, harmless from any and all liability, public or private, penalties, contractual or otherwise, losses, damages, costs, attorney's fees, expenses, causes of action, claims or judgments resulting from a claim filed by anyone in connection with the aforementioned acts, or any rule, regulation or order promulgated thereunder, arising out of the Contractor's Work, this Agreement or any subcontract executed in prosecution of the Work. Contractor further agrees in the event of a claim of violation of any such laws, regulations, orders or procedures arising out of or in any way connected with the performance of this agreement, Construction Manager may immediately take whatever action is deemed necessary by Owner and/or Construction Manager to remedy the claim or violation. Any and all costs or expenses paid or incurred by Owner and/or Construction Manager in taking such action shall be borne by Contractor, and may be deducted from any payments due Contractor.
- 4.2 The Contractor agrees to (1) take all necessary steps to promote safety and health on the job site; (2) cooperate with Owner and/or Construction Manager and other Contractors in preventing and eliminating safety and health hazards; (3) train, instruct and provide adequate supervision to ensure that its employees are aware of, and comply with, applicable Federal and State safety and health laws, standards, regulations and rules, safe healthful work practices and all applicable safety rules, regulations and work practices and procedures (4) not create any hazards or expose any of its employees, employees of the Owner and/or Construction Manager or employees of Contractors to any hazards; and (5) where the Contractor is aware of the existence of a hazard not within its control, notify the Construction Manager of the hazard as well as warn exposed persons to avoid the hazard.
- 4.3 The Contractor's Superintendent or Safety Supervisor shall immediately, verbally

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- report, and promptly thereafter confirm in writing to the Construction Manager any unsafe conditions or practices that are observed, or violations of job safety which are not within the Contractor's control.
- 4.4 Contractors shall immediately, verbally report, and promptly thereafter confirm in writing, to the Construction Manager any unsafe practices or conditions that are observed which are not under the Contractor's control.
- 4.5 The Contractor's Superintendent or Safety Supervisor shall insure that adequate first aid supplies are available, and that personnel are qualified to administer first aid/CPR, as required by State and/or Federal regulations.
- 4.6 Contractor shall promptly notify Construction Manager of any personal injury requiring medical treatment of any of the Contractor's employees at the Project site; or of significant damage to property arising in connection with Contractor's performance, as promptly as possible after the occurrence of such injury or damage. Within twenty-four hours of such occurrence, Contractor shall furnish to Construction Manager a complete written report of such injury or damage.
- 4.7 Contractor certifies that the forgoing terms shall be made applicable to all Contractors' suppliers, materialmen or anyone furnishing labor and/or materials to the site.
- 4.8 The Contractor shall continue to educate his job Safety Supervisor or Superintendent of their responsibilities, which shall include:
1. Instructing workers and subcontractors under its supervision in safe work practices and work methods at the time they are given work assignments.
 2. Ensuring that its workers and subcontractors have and use the proper protective equipment and suitable tools for the job.
 3. Continuously checking to see that no unsafe practices or conditions are allowed to exist on any part of his job.
 4. Acquainting its workers and subcontractors with all applicable safety requirements and seeing that they are enforced.
 5. Setting a good example for his workers.
 6. Making a complete investigation of accidents to determine facts necessary to take corrective action.
 7. Promptly completing a "Supervisor's Investigation Form" with his Supervisor's assistance and distributing as required. This form will be provided by the Construction Manager.

8. Holding weekly "tool box" safety meetings with his men to:
 - a. Discuss observed unsafe work practices or conditions including a review of current Construction Manager safety report.
 - b. Review the accident experience of his crew and discuss correction of accident causes.
 - c. Encourage safety suggestions from his men.
 9. Seeing that prompt medical treatment is administered to an injured employee.
 10. Correcting or reporting immediately to job superintendent any observed unsafe conditions, practices or violations of job security.
 11. Making all reports required by these Contract Documents to the Construction Manager in a full and timely fashion.
5. SAFETY MEETINGS
- 5.1 The Contractor's Project Manager or Superintendent shall attend weekly or biweekly supervisory job meetings. The first topic of these meetings will be job site safety. The weekly safety reports will be reviewed and violations must be corrected immediately. Contractors will be encouraged to participate in the on-going jobsite safety.
6. TOOL BOX SAFETY MEETINGS
- 6.1 The Contractor shall schedule weekly "tool box" safety sessions to be held by his job safety supervisor or superintendent for all of his employees.
 - 6.2 A member of the Contractor's management staff shall periodically attend "tool box" safety sessions to evaluate their effectiveness and offer any appropriate suggestions for improvement.
7. REPORTS
- 7.1 Contractors shall report all accidents or injuries on a timely basis in accordance with all applicable regulations.
 - 7.2 Contractors shall promptly complete an accident investigation report of all accidents.
 - 7.3 A record of all "tool box" safety sessions shall be made and submitted to the Construction Manager on forms to be provided.

8. SAFETY REPRESENTATIVE

- 8.1 The Construction Manager may employ the services of a Safety Representative on the project.
- 8.2 The Safety Representative *will* visit the job site on a weekly basis to determine if the work is being performed in a safe manner and in accordance with OSHA, State and Local safety regulations. Safety representative is not responsible for observing and documenting all possible safety violations. The Contractor's Safety Representative or Superintendent shall attend job site safety inspections with the Safety Representative on a weekly basis.
- 8.3 The Safety Representative will file a written report with the Construction Manager at the end of each inspection listing the safety violations observed during the inspection.
- 8.4 The Construction Manager will distribute the Safety Representative's report to all Contractors. All safety violations must be corrected immediately.

9. RIGHT TO STOP THE WORK DUE TO SAFETY VIOLATIONS

- 9.1 The Construction Manager, in its sole discretion, may order the Contractor to stop the work due to safety violations under the following circumstances:
 - 1. If the Construction Manager observes the Contractor is violating safety regulations and the Contractor takes no immediate action to correct the violation.
 - 2. If the Contractor has been notified by the Construction Manager in writing that he is in violation of safety regulations and fails to take action to correct the violation within 24 hours of the notice.
- 9.2 If the Construction Manager directs the Contractor to stop the work due to safety violation, it will be done in accordance with the General Conditions of the Contract. Contractor shall not be permitted an adjustment of the Contract Time or Sum for the days lost to any suspension of work.
- 9.3 If the Construction Manager or Safety Representative observes Contractor's employee violating this safety program or OSHA Standards in an habitual manner, or creating a serious life safety violation, the Construction Manager or Safety Representative may instruct the Contractor's superintendent or foreman to remove the violator from the work site for failure to comply with the safety program and the contract.

10. EMERGENCY PROCEDURES

- 10.1 The Construction Manager shall establish a central meeting location for the assembly

of all Contractors' employees in the event of a major job site emergency.

10.2 Contractor shall assemble all of their personnel and account for all employees. Contractor must immediately report to the Project Superintendent with the status of their employees.

11. FALL PROTECTION PROCEDURES

11.1 Contractor is responsible, in accordance with federal, state, local laws and regulations including OSHA, to provide and enforce their own site specific fall protection program and equipment. The following fall protection procedures shall be enforced by all Contractors as a minimum standard.

All workers on walking/working surfaces with unprotected sides or edges six feet (6') or higher above the next lower level must be protected from falls by the use of guardrail systems, net systems, fall arrest systems or control access zone programs. It is intended that when fall protection is required, it is required 100% of the time. All contractors are reminded that relevant industry regulations require that contractors comply with the following standards.

1. Workers constructing or working near leading edges must be protected.
2. Workers on the face of formwork or reinforcing steel must be protected at a height of 6 feet (6') or greater.
3. Scaffolds shall be guarded at 6 feet (6') above next lower level.
4. Brick layers performing overhand bricklaying and related work six feet (6') or higher above lower levels must be protected from falls.
5. Roofers must comply with OSHA standards for roof work.
6. The Contractor's controlled access zone plan shall be included in their site-specific safety program and shall be submitted prior to the start of work. Contractors are responsible for assuring programs are OSHA compliant.
7. Guidelines for Residential Construction or any interpretations will not be accepted in lieu of 1926 Standards.
8. Contractors must provide certification per OSHA CFR29 § 1926.503(b) of employee training and retraining on fall protection upon request.

11.2 Contractor shall provide its own fall protection. Fall protection may be provided by guardrail systems, net systems, or personal fall arrest systems. All fall protection systems must comply with OSHA standards.

- 11.3 Stepladders, exposed to shafts or edges of the building, greater than six feet (6') above the next lower level, must be tied off or otherwise secured. Employee must wear fall protection, i.e. harness/lanyard.
- 11.4 The Safety Cable System shall not be altered or removed without a written request submitted to the Project Manager with a copy to the Field Manager. It shall be the responsibility of each and every Contractor that is removing or altering the Safety Cable System to maintain the fall protection safety provided by the safety cable and not leave the area unprotected. Each and every Contractor shall be responsible to re-install the Safety Cable System immediately after work is completed. Each and every Contractor shall be responsible to re-install the Safety Cable System in accordance to OSHA standards.
- 11.5 Fall protection will be enforced for Structural Steel Erectors.
1. As for a Contractor engaged in structural steel erection, the Contractor is specifically advised that structural steel erectors shall comply with all protection requirements for all work at a height of six feet (6') or greater above the next lower level, 100 percent of the time, by any of the following means.
 - a. Standard guardrail system.
 - b. Personal Fall Arrest System (PFAS) – full body harness with shock absorbing lanyard. Maximum free fall distance permitted, with lanyard and lanyard attachment shall not exceed six feet (6'). Anchor point must be capable of supporting five thousand pounds. Perimeter guard cables or alignment cables may not be used for anchor points.
 - c. Access to work area shall be provided by ladders. There shall be sufficient number of ladders available to reduce the amount of “beam walking.” When it is absolutely necessary to traverse a beam, 100% fall protection must be utilized.
 - d. Steel erection Contractors must, at all times, be able to certify in writing that each of his employees has been properly trained in both OSHA fall protection standards and the Contractor’s site specific project fall protection procedures.
 - e. Prior to the erection of the steel, the Contractor shall meet with the Project Manager and Safety Representatives to review and document site specific procedures.

END OF SECTION

SECTION 01 45 00 - QUALITY CONTROL

1. DESCRIPTION

1.1 Quality control services include inspections and tests performed by independent agencies and governing authorities, as well as by the Contractor. Inspection and testing services are intended to determine compliance of the work with requirements specified. Specific quality control requirements are specified in individual specification sections.

2. RESPONSIBILITIES

2.1 Contractor Responsibilities: Except where indicated as being the Owner's responsibility, quality control services are the Contractor's responsibility, including those specified to be performed by an independent agency and not by the Contractor. The Contractor shall employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified.

1. The Owner will engage and pay for services of an independent agency to perform the inspections and tests that are specified as Owner's responsibilities.

2.2 Retest Responsibility: Where results of inspections or test do not indicate compliance with Contract Documents, retests are the Contractor's responsibility.

2.3 Responsibility for Associated Services: The Contractor shall cooperate with independent agencies performing inspections or test. Provide auxiliary services as are reasonable. Auxiliary services include:

1. Provide access to the Work.
2. Assist taking samples.
3. Deliver samples to test laboratory.

2.4 Coordination: The Contractor and independent test agency shall coordinate the sequence of their activities and shall avoid removing and replacing work to accommodate inspections and test. The Contractor is responsible for scheduling time for inspections and tests.

2.5 Qualifications for Service Agencies: Contractor shall engage only inspection and test service agencies which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories.

2.6 Submittals: Contractor shall submit a certified written report of each test, Inspection

or similar service, in duplicate to the Construction Manager. Contractor shall submit additional copies of each report to any governing authority, when the authority so directs.

2.7 Report Data: Written inspection or test reports shall include:

1. Name of testing agency or test laboratory.
2. Dates and locations of samples, tests or inspections.
3. Names of individual present.
4. Complete inspection of test data.
5. Test results.
6. Interpretations.
7. Recommendations.

2.8 Repair and Protection: Upon completion of inspection or testing, Contractor shall repair damaged work and restore substrates and finishes. Contractor shall comply with requirements for "Cutting and Patching."

2.9 The 2000 IBC code the following testing is code required:

1. Structural tests and special inspections must be conducted by an approved agency (an agency or firm regularly engaged in conducting tests or furnishing inspection services, approved by the authority having jurisdiction.) This means that contractors will no longer be allowed to cast their own test cylinders for example.
2. Continuous special inspection (the full-time observation of work by an approved special inspector who is present until completion of the work) is required for any steel welds and connections. Critical elements may include: all slip critical bolted connections, complete and partial groove welds, multi-pass fillet welds and single pass fillet welds greater than 5/16".
3. Continuous special inspection is required during the placement of all concrete and shotcrete for the proper application techniques with a few exceptions.
4. Periodic special inspection (the part-time observation by an approved special inspector) is required for any steel welds and connections. Critical elements may include: all slip critical bolted connections, complete and partial groove welds, multi-pass fillet welds and single pass fillet welds greater than 5/16".

5. Spray applied fireproofing requires periodic special inspection for the structural member surface conditions, application, thickness, density and bond strength.
6. Based on the classification, occupancy, and design of the structure, the code requires periodic special inspection for placement of masonry units and reinforcing steel and continuous special inspection of grout placement.

END OF SECTION

SECTION 01 51 23 - TEMPORARY HEATING, COOLING AND VENTILATING

1. GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

1. Temporary Electric: Section 01 51 13
2. Temporary Facilities: Section 01 52 00
3. Heating Requirements for Cold Weather Installation and Protection of Materials:
Respective specification section for each item of work.
4. Section 01511 Construction IAQ Management.

1.2 DEFINITIONS:

Temporary power to be provided by building contractor for his work.

END OF SECTION

SECTION 01 52 00 - CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

1. GENERAL

1.1 DESCRIPTION

1. Construction Manager and Contractors shall provide all temporary facilities throughout the construction period unless otherwise indicated in the Contract Documents.
2. Construction Manager and Contractors shall pay all costs for providing, maintaining and removing of all temporary facilities unless otherwise indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

1. Temporary Electric: Section 01 51 13.

2. FACILITIES

2.1 TEMPORARY SANITATION FACILITIES

1. Construction Manager will provide and maintain sanitary facilities for all personnel on the project.
2. The number of sanitary facilities required shall be based on the total number of workers employed on the site and shall be in accordance with the provisions of the applicable code.
3. Construction Manager will maintain sanitary facilities in a sanitary and clean condition at all times.

2.2 TEMPORARY WATER

1. Drinking Water: Contractor shall provide potable water for drinking purposes for all his personnel on the site. He shall furnish disposable drinking cups at water stations. Each water station shall be equipped with a suitable trash container for disposal of the drinking cups.
2. Construction Water: Construction Manager will provide and maintain tap locations for construction water of sufficiently pure and potable quality to avoid deleterious effect on any materials used. Location of construction water tap locations will be determined by the Construction Manager depending on the stage of construction of the incoming water service. Contractor shall provide and maintain all hoses, piping and valves as required for obtaining construction

water from taps provided by the Construction Manager.

2.3 TEMPORARY TELEPHONES

1. Construction Manager will not provide any telephones or fax machines for Contractor's personnel. Each Contractor is responsible for its own phones and fax machines.

2.4 FIELD OFFICE

1. During the period of the Work and until final acceptance of the project, the Construction Manager will provide a weatherproof building for the Construction Manager's Field Project Manager(s) and Superintendent(s). Contractor shall make provisions for its own field office, subject to approval by the Construction Manager.

2.5 FIRE PROTECTION

1. The Construction Manager will provide and maintain portable fire extinguishers on each floor level and building area. Number to conform to applicable codes.
2. Contractor shall provide additional fire extinguishers as required by OSHA regulations for its work.
3. Fire extinguishers shall be Multi-Purpose (ABC) dry chemical, UL labeled.

2.6 ACCESS ROADS AND PARKING AREAS

1. The Construction Manager will provide and maintain access roads on the site.
2. Neither the Construction Manager nor the Owner will provide parking for Contractor's personnel on or about the project site. All parking provisions required for Contractors will be solely the responsibility of the Contractors or their personnel.

2.7 STORAGE AREAS

1. The Construction Manager will assign storage areas on the site. Storage areas are extremely limited and will be assigned in a manner which will best facilitate the work.
2. Contractor shall provide all other storage space required for its work at off-site locations.
3. All combustible or flammable materials must be safely stored in a secured area

in strict accordance with regulations, codes and laws enforced by local, State or Federal agencies, whichever is the most stringent.

2.8 FIRST AID STATION

1. The Construction Manager will provide and maintain an unmanned first aid station for all personnel in his jobsite office.

2.9 SECURITY

1. All safety and security measures shall be the responsibility of each Contractor. These measures shall include but are not limited to the provision of secured storage for tools, construction equipment, and materials and equipment scheduled for installation in the building.

2.10 BENCH MARKS AND BASELINE

1. The Construction Manager will lay out and establish and maintain bench marks and baselines.
2. The Contractor shall lay out his own work and shall be responsible for the accuracy of same.
3. Contractor shall check grades, lines, levels and dimensions as shown on the drawings and shall promptly report errors or inconsistencies in same to the Construction Manager before Work proceeds.
4. The Contractor is responsible for damaging or altering the bench marks and baselines established by the Construction Manager and shall bear the costs of replacing same.

2.11 FIELD OFFICE AND STORAGE TRAILERS

1. Contractor shall provide and maintain its own field office and storage trailers as required.
2. Contractor shall provide temporary heat and power for its field office and storage trailer.
3. Contractor's field offices and storage trailers shall be located as directed by the Construction Manager.

2.12 PROJECT SIGN

1. The Construction Manager will provide a Project Sign naming the major

participants, as determined by the Owner.

2.13 TRASH DISPOSAL

1. Each Contractor shall be responsible for clean up and depositing its common trash in the dumpsters provided by the Construction Manager.
2. The Construction Manager will not provide a trash chute.
3. The Construction Manager will provide dumpsters, and will arrange for disposal of common, non-hazardous, work-related trash deposited in these dumpsters.

2.14 HOISTING

1. Contractor shall provide its own materials hoists and cranes. No personnel hoist will be provided.

2.15 SCAFFOLDING AND WORKING PLATFORMS

1. No scaffolding shall be provided by the Construction Manager. Each Contractor shall provide all scaffolding required to perform its Work.

2.16 SAFETY BARRICADES AND RAILINGS

1. The Structural Contractor shall provide barricades around elevator, stair, shaft and cut openings in floors and roofs, and edges of floors and roofs. All barricades shall at a minimum, be constructed of two runs of 1/2" diameter wire rope cable with adequate turn-buckle and eyes such that no more than 60' of cable need be loosened or removed at any given location for access. All cables shall be installed such that no more than 3" of deflection of the cable is achieved at any point between supports. The methods and materials used in barricading shall be in accordance with OSHA and local code regulations, and shall be approved by the Construction Manager prior to installation. Barricades will be installed immediately after the installation of the floor slab on any level or part of a level on the Building. Until a level has been fully barricaded, the Structural Contractor will be responsible for maintenance of the barricades. After a level has been fully barricaded, the Construction Manager will assume maintenance of the barricades until a subsequent contractor requires the barricades to be removed in order to accomplish his work, at which time that contractor will assume maintenance of the barricades.
2. After the barricades are no longer needed, the Construction Manager will remove the barricades from the site. The Construction Manager will determine the location and scheduling of barriers to be removed.

3. Contractor shall provide for its own barricades at all other trenches, excavations, and locations not specifically identified in Paragraph 1 above.
4. Contractors who remove barricades shall be responsible for replacing them. If, after proper notification, in writing, from the Construction Manager the responsible Contractor does not correct his deficiencies in safety barricade placement, the Construction Manager reserves the right to undertake this work and backcharge the responsible Contractor(s).
5. During the execution of his work, Contractor will provide daily maintenance of, and upon completion of same, restore all barricades in a manner acceptable to prevailing safety standards enforced by local, State or Federal ordinance, whichever is most stringent. The intent is to leave no floor penetration or perimeter opening in an unsafe condition.
6. The Construction Manager shall arrange for temporary ladders required for access to each of the floor levels after the completion of floor slab work, and until the final stairs are ready for use.

2.17 PUMPING AND DRAINAGE

1. Contractor shall provide its own pumping and drainage.
2. When an area is released by one Contractor to another, the Contractor releasing an area shall be responsible for leaving it in a drained condition. The incoming Contractor shall assume responsibility for drainage on the day that he is scheduled to start work in the area. If the incoming Contractor is late in starting work, he shall assume responsibility for pumping and drainage arising as a result.

2.18 TEMPORARY BUILDING ENCLOSURES

N/A

2.19 TEMPORARY POWER AND LIGHTING

1. Provide own power source if required.
2. Contractor shall provide its own additional temporary lighting of sufficient lighting levels to properly install his work.

2.20 TEMPORARY HEAT

1. To be provided by General Carpentry Contractor if required for his work.

2.21 PROTECTION OF ADJACENT MATERIALS

1. Contractor shall protect adjacent materials and finishes from damage as a result of its work.

2.22 CLEAN UP

1. Contractor shall arrange for clean up and removal of debris resulting from its operations, and shall dispose of debris in accordance with the provisions of Paragraph 2.13 above. Clean up shall be scheduled on a continual basis to ensure that building, grounds and public properties are maintained free from accumulations of waste materials and trash, but in any case not less than once a week.
2. The Contractor will ensure that all waste materials that are combustible or flammable will be removed from the building at the end of each work day. All trash considered to be edible by rodent will be disposed of in metal containers and removed by the end of the work day.
3. At completion of its Work, each Contractor shall remove waste materials, rubbish, tools, equipment, and clean up all exposed surfaces in preparation for final cleaning.
4. If, after notification in writing from the Construction Manager, the Contractor does not correct its deficiencies in housekeeping within twenty four (24) hours, the Construction Manager reserves the right to undertake the Work and to backcharge the Contractor.
5. Final clean up prior to Owner occupancy shall be arranged for by the Construction Manager.

2.23 DUST PROTECTION

1. Contractor shall erect and maintain dust proof protection whenever its operations will produce dust and dirt that might filter through the building into occupied or finished areas. Contractor shall be responsible for all cleaning required due to its failure to provide such dust protection.

2.24 PROTECTION OF EXISTING CONSTRUCTION

1. Contractor shall be responsible for all damage that it may cause to materials and equipment stored or installed by other Contractors.

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1. Contractor shall provide any other Temporary Facilities and services that it requires and which are not specifically identified above.

3. PERMITS
 - 3.1 The Construction Manager will obtain the Building Permit. All other permits are to be obtained and paid for by the Contractor requiring them.

4. EXECUTION
 - 4.1 GENERAL
 1. Contractor shall install all temporary facilities in accordance with applicable codes.
 2. Contractor shall maintain temporary facilities for which it is responsible throughout the construction period.
 3. Contractor shall remove all temporary facilities for which it is responsible when they are no longer required or when the Construction Manager directs the removal of same.
 4. Contractor shall repair all damage to the Project Site caused by the installation of its temporary facilities.

END OF SECTION

SECTION 01 62 00 - MATERIAL AND EQUIPMENT

1. GENERAL CONDITIONS

- 1.1 The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other Conditions, if any) and Division 1 as appropriate apply to the Work specified in this Section.
- 1.2 Where work is to be executed under Separate Prime Contracts, the provisions of this Section apply to each Contract.

2. REQUIREMENTS INCLUDED

- 2.1 All materials and equipment incorporated into the Work shall:
 1. be new;
 2. conform to applicable specifications and standards; and
 3. comply with size, make, type and quality specified, or as specifically approved in writing by the Architect.
- 2.2 Manufactured and Fabricated Products shall conform to the following requirements:
 1. Designed, fabricated and assembled in accord with the best engineering and shop practices.
 2. Manufactured like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 3. Two or more items of the same kind shall be identical, by the same manufacturer.
 4. Products shall be suitable for service conditions.
 5. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
- 2.3 Contractor shall not use materials or equipment for any purpose other than that for which it is designated or is specified.
- 2.4 Materials removed from existing structures shall not be reused in the completed work unless specifically indicated or specified.
- 2.5 For materials and equipment specifically indicated or specified to be reused in the

Work:

1. Contractor shall use special care on removal, handling storage and reinstallation, to assure proper function in the completed Work.
2. Arrange for transportation, storage and handling of products which require off-site storage, restoration or renovation. Pay all costs for such work.

3. MANUFACTURER'S INSTRUCTIONS

3.1 When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including two copies to Construction Manager.

1. Maintain one set of complete instructions at the job site during installation and until completion.

3.2 Contractor shall handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, Contractor shall consult with Construction Manager for further instructions.
2. Contractor shall perform work in accord with manufacturer's instructions. Contractor shall not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

4. TRANSPORTATION AND HANDLING

4.1 Contractor shall arrange deliveries of Products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.

1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
2. Contractor shall immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that Products are properly protected and undamaged.

4.2 Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

5. STORAGE AND PROTECTION

5.1 Contractor shall store Products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Contractor shall store Products subject to damage by the elements in weathertight enclosures.
2. Contractor shall maintain temperature and humidity within the ranges required by manufacture's instructions.

5.2 Exterior Storage

1. Contractor shall store fabricated Products above the ground, on blocking or skids, to prevent soiling or staining. Cover Products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
2. Contractor shall store loose granular materials in a well-drained area on soiled surfaces to prevent mixing with foreign matter.

5.3 Contractor shall arrange storage in a manner to provide easy access for inspection. Contractor shall make periodic inspections of stored Products to assure that Products are maintained under specified conditions, and free from damage or deterioration.

5.4 Contractor shall store flammable materials so as to prevent contact with flames and fire. Conform with manufacturer's recommendations and local laws. Pay particular attention to storage of:

1. Roof insulation.
2. Roofing materials, including solvents.
3. Paint materials.
4. Cleaning and other solvents.
5. Fuels.

5.5 Protection after Installation:

1. Contractor shall provide substantial coverings as necessary to protect installed Products from damage from traffic and subsequent construction operations. Remove when no longer needed.

6. SUBSTITUTIONS AND PRODUCT OPTIONS

6.1 Product List.

1. Within 30 days after Contract Date, Contractor shall submit to Construction Manager a complete list of major products proposed to be used, with the name of the manufacturer and the installing Contractor.

6.2 Contractor's Options.

1. For Products specified only by reference standard, Contractor shall select any Product meeting that standard.
2. For Products specified by naming several Products or manufacturers, Contractor shall select any one of the Products or manufacturers named which complies with the specifications.
3. For Products specified by naming one or more Products or manufacturers and "or equal", Bidders must, during the bidding period, submit a request for substitutions for any Product or manufacturer not specifically named. See provisions in Paragraph 1.6.3.
4. For Products specified by naming only one Product and manufacturer, there is no option; and Contractor shall provide the precise Product specified.

6.3 Substitutions.

1. Until a date no later than seven (7) days before the date Bids are due, Architect will consider written requests from bidders for substitution of Products. The contractor will submit any substitution requests to the Construction Manager for transmittal to the Architect. The architect will review requests and will notify Bidders in an Addendum if the requested substitution is acceptable.
2. Should the Bidder desire a substitution, it shall submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:
 1. Comparison of the qualities of the proposed substitution with that specified.
 2. Changes required in other elements of the Work because of the substitution.
 3. Effect on the construction schedule.
 4. Cost data comparing the proposed substitution with the Product specified.

5. Any required license fees or royalties.
6. Availability of maintenance service, and source of replacement materials.
3. Architect, in its sole discretion, shall be the judge of the acceptability of the proposed substitution.
4. A request for a substitution constitutes a representation that Bidder:
 1. has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified;
 2. will provide the same warranties or bonds for the substitution as for the Product specified;
 3. will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects; and
 4. waives all claims for additional costs, under his responsibility, which may subsequently become apparent.
- 6.4 Architect will review requests for substitutions with reasonable promptness, and notify Bidders, in writing, through the Construction Manager, of the decision to accept or reject the requested substitution. Any decision to accept a substitution must be confirmed in an Addendum issued during the bidding period in order to be valid. Oral approvals will not be binding.

END OF SECTION

SECTION 01 71 23 - FIELD ENGINEERING

1. GENERAL PROVISIONS

1.1 The general provisions of the Contract, including the Conditions of the Contract, (General, Supplementary and other Conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

1.2 The provisions of the section apply to all contracts.

2. SURVEY

2.1 The Owner has had a site survey prepared by Becker Morgan Group. This information has been included in this Bid Pac.

3. CONSTRUCTION MANAGER

3.1 The Construction Manager will establish a bench mark and base line from which structures and grades shall be laid out by Contractors as designated in this section. The total extent of this layout is shown on the site drawings. One bench elevation shall be provided.

END OF SECTION

SECTION 01 73 29 - CUTTING AND PATCHING

1. GENERAL

- 1.1 Definition: "Cutting and Patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.
- 1.2 Refer to Other Sections of these specifications for specific cutting and patching requirements and limitations applicable to individual units of work.
- 1.3 Structural Work: Do not cut and patch structural work in a manner resulting in a reduction of load carrying capacity or load deflection ratio. Submit proposal and request and obtain Architect's/Engineer's approval before proceeding with cut and patch of structural work.
- 1.4 Operational/Safety Limitations: Do not cut and patch operational elements and safety components in a manner resulting in decreased performance, shortened useful life, or increased maintenance. Submit proposals and requests and obtain Architect's/Engineer's approval before proceeding with cut and patches of structural work.
- 1.5 Visual/Quality Limitations: Do not cut and patch work exposed to view (exterior and interior) in manner resulting in noticeable reduction of aesthetic qualities and similar qualities, as judged by Architect/Engineer.
1. Engage the original Installer/Fabricator, or (if not available) an acceptable equivalent entity, to cut and patch the following categories of exposed work but not limited to
 2. Exterior wall materials, ie., curtain wall
 3. Finish floor materials, ie., substrate, carpet, ceramic tile
 4. Walls
 5. Ceilings
- 1.6 Limitation on Approvals: Architect's/Engineer's approval to proceed with cutting and patching does not waive right to later acquire removal/replacement of work found to be cut and patched in an unsatisfactory manner, as judged by Architect/Engineer.

2. MATERIALS

- 2.1 General: Use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal or better

performance characteristics.

3. EXECUTION

- 3.1 Inspection: Before cutting, examine surfaces to be cut and patched and conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.
- 3.2 Temporary Support: To prevent failure provide temporary support of work to be cut.
- 3.3 Protection: Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.
1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
 2. Take precautions not to cut existing pipe, conduit or duct serving the building but scheduled to be relocated until provisions have been made to bypass them.
- 3.4 Cutting: Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible review proposed procedures with the original installer; comply with original installer's recommendations.
1. Where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a carborundum saw or core drill. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut and drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.
- 3.5 Patching: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
1. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and finishing.

END OF SECTION

SECTION 01 77 00 - CONTRACT CLOSE OUT

1. DESCRIPTION OF REQUIREMENTS

- 1.1 Provisions of this section apply to the procedural requirements for the actual close out of the Work, not to the administrative matters such as final payment or the change over of insurance. Close out requirements relate to both substantial and final completion of the Work; they also apply to individual portions of completed work as well as the Total work. Specific requirements contained in other sections have precedence over the general requirements contained in this section.
- 1.2 Closeout documents will be submitted through the Building Blok Management Program.

2. PROCEDURES AT SUBSTANTIAL COMPLETION

- 2.1 Prerequisites: Contractor shall comply with the General Conditions and complete the following before requesting inspection of the Work, or a designated portion of the Work, for certification of substantial completion:

1. submit executed warranties, workmanship bonds, maintenance agreements, inspection certificates, releases of liens, tax certification and similar required documentation for specific units of work, and documents needed to enable Owner's unrestricted occupancy and use;
2. submit record documentation, maintenance manuals, tools, spare parts, keys and similar operational items;
3. complete instructions of Owner's operating personnel, and start up of systems; and
4. complete final cleaning and remove temporary facilities and tools.

- 2.2 Inspection Procedures: Upon receipt of Contractor's request, Architect/Engineer will either proceed with inspection or advise Construction Manger of prerequisites not fulfilled. Following initial inspection, Architect/Engineer will either prepare certificate of substantial completion, or advise Construction Manager of work which must be performed prior to issuance of certificate. The Architect/Engineer will repeat the inspection when requested and assure that the work has been substantially completed. Results of the completed inspection will form the initial "punch list" for final acceptance.

- 2.3 Punch List Procedures: Each Contractor shall be given a copy of the punch list with its appropriate work identified. Each Contractor shall be given 9 (nine) calendar

work days to complete their punch list work. On the 10th day or as determined by the Construction Manager the Construction Manager shall employ other Contractors, as required, to complete any incomplete punch list work and retain from the appropriate Contractors retainage all costs incurred.

3. PROCEDURES AT FINAL ACCEPTANCE

3.1 Reinspection Procedure: The Architect/Engineer will reinspect the Work upon receipt of the Contractor's notice that, except for those items whose completion has been delayed due to circumstances that are acceptable to the Architect/Engineer, the Work has been completed, including punch list items from earlier inspections. Upon completion of reinspection, the Architect/Engineer will either recommend final acceptance and final payment, or will advise the Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, this procedure will be repeated.

4. RECORD DOCUMENTATION

4.1 Record Drawings: Contractor shall maintain a complete set of either blue or black line prints of the contract documents and shop drawings for record mark up purposes throughout the Contract Time. Contractor shall mark up these drawings during the course of the Work to show both changes and the actual installation, in sufficient detail to form a complete record for Owner's purposes giving particular attention to work that will be concealed and difficult to measure and record at a later date, and Work which may require servicing or replacement during the life of the project. Require the entities marking prints to sign and date each mark up. Bind prints into manageable sets, with durable paper cover, appropriately labeled.

4.2 Maintenance Manual: Contractor shall provide 3-ring vinyl covered binders containing required maintenance manuals, properly identified and indexed and including operating and maintenance instructions extended to cover emergencies, spare parts, warranties, inspection procedures, diagrams, safety, security, and similar appropriate data for each system of equipment item.

4.3 State Tax Certification: Contractor shall provide recent Delaware State Tax Certification form as issued by State of Delaware, Department of Finance, Division of Revenue, Carvel State Office Building, 820 N. French Street, Wilmington, Delaware 19801.

5. GENERAL CLOSE OUT REQUIREMENTS

5.1 Operator Instruction: Contractor shall require each Installer of systems requiring continued operation and maintenance by Owner's operating personnel, to provide on location instruction to Owner's personnel, sufficient to ensure safe, secure, efficient,

non-failing utilization and operation of systems. Contractor shall provide instructions for the following categories of work:

1. Mechanical/electrical/electronic systems (not limited to work of Division 15 and 16).
2. Roofing, flashing, joint sealers.
3. Floor finishes.

6. FINAL CLEANING

6.1 At the time of project close out Contractor shall clean or reclean the Work to the condition expected from a normal, commercial building cleaning and maintenance program. Complete the following cleaning operations before requesting the Architect/Engineer's inspection for certification of substantial completion:

1. Remove non-permanent protections and labels.
2. Polish glass.
3. Clean exposed finishes.
4. Touch up minor finish damage.
5. Clean or replace mechanical systems filters.
6. Remove debris.
7. Broom clean unoccupied spaces.
8. Sanitize plumbing and food service facilities.
9. Clean light fixtures and replace burned out lamps.
10. Sweep and wash paved areas.
11. Police yards and grounds.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous construction waste.
 - 2. Recycling nonhazardous construction waste.
 - 3. Disposing of nonhazardous construction waste.
- B. Related Requirements:
 - 1. Section 04 20 00 "Unit Masonry" for disposal requirements for masonry waste.
 - 2. Section 31 10 00 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.02 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- E. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.03 PERFORMANCE REQUIREMENTS

- A. General: Achieve minimum end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:
 - 1. Construction Waste:
 - a. Masonry and CMU.
 - b. Lumber.
 - c. Wood sheet materials.
 - d. Wood trim.
 - e. Metals.
 - f. Roofing.
 - g. Insulation.
 - h. Carpet and pad.
 - i. Gypsum board.
 - j. Piping.
 - k. Electrical conduit.

1. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

1.04 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 days of date established for the Notice to Proceed.

1.05 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in tons.
 4. Quantity of waste salvaged, both estimated and actual in tons.
 5. Quantity of waste recycled, both estimated and actual in tons.
 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. LEED Submittal: LEED letter template for Credit MR 2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.
- H. Qualification Data: For waste management coordinator and refrigerant recovery technician.

- I. 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.

1.06 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED-Accredited Professional, certified by the USGBC, as waste management coordinator.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
 2. Review requirements for documenting quantities of each type of waste and its disposition.
 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 5. Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Track and keep a summary log of all construction waste generated by type, the quantities of each type that were diverted and landfilled, and the total percentage of waste diverted from landfill disposal. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan. Plan shall, at a minimum, identify the diversion goals, relevant construction debris and materials to be diverted, implementation protocols, and parties responsible for implementing the plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 3. Salvaged Materials for Donation: For materials that will be donated to individuals

- and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.03 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Polystyrene Packaging: Separate and bag materials.
 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

3.04 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 81 13

SUSTAINABLE DESIGN REQUIREMENTS LEED FOR SCHOOLS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes general requirements and procedures for compliance with certain USGBC LEED prerequisites and credits needed for Project to pursue LEED Silver certification based on USGBC's "LEED 2009 for Schools New Construction and Major Renovations."
 - 1. Other LEED prerequisites and credits needed to obtain LEED certification depend on product selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
 - 2. Additional LEED prerequisites and credits needed to obtain the indicated LEED certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.
 - 3. A copy of the LEED Project checklist is attached at the end of this Section for information only.
- B. Related Requirements:
 - 1. Divisions 01 through 49 Sections for LEED requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.

1.02 DEFINITIONS

- A. Agrifiber Board: A composite panel product derived from recovered agricultural waste fiber from sources such as cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks, and agricultural prunings. The raw fibers are processed and mixed with resins to produce panel products with characteristics similar to those derived from wood fiber. The following conditions describe which products must comply with requirements:
 - 1. The product is inside the building's waterproofing system.
 - 2. Composite components used in assemblies are to be included (e.g., door cores, panel substrates).
 - 3. The product is part of the base building systems.
- B. Certified Wood:
 - 1. Chain-of-Custody (COC): A tracking procedure for a product from the point of harvest or extraction to its end use, including all successive stages of processing, transformation, manufacturing, and distribution.
 - 2. Chain-of-Custody Certification: Certification awarded to companies that produce, sell, promote, or trade forest products after audits verify proper accounting of material flows and proper use of the Forest Stewardship Council name and logo. The COC certificate number is listed on invoices for nonlabeled products to document that an entity has followed FSC guidelines for product accounting.
- C. Composite Wood: Wood or plant particles or fibers bonded together by a synthetic resin or binder. Examples include plywood, particleboard, oriented-strand board (OSB), medium-density fiberboard (MDF), and composite door cores. The following conditions describe which products must comply with the credit requirements:
 - 1. The product is inside the buildings waterproofing system.

2. Composite wood components used in assemblies are included (e.g., door cores, panel substrates, plywood sections of I-beams).
 3. The product is part of the base building systems.
- D. Construction Indoor Air Quality Management Plan: A plan that outlines measures to minimize contamination in a specific Project building during construction and describes procedures to flush the building of contaminant prior to occupancy.
- E. Construction and Demolition Debris: Waste and recyclables generated from construction and from the renovation, demolition, or deconstruction of preexisting structures. It does not include land-clearing debris, such as soil, vegetation, and rocks.
- F. Contaminants: Unwanted airborne elements that may reduce air quality. (ASHRAE 62.1-2007)
- G. Indoor Air Quality (IAQ): The nature of air inside a building that affects the health and well-being of building occupants. It is considered acceptable when there are known contaminants at harmful concentrations as determined by cognizant authorities and with which a substantial majority (80% or more) of the people exposed do not express dissatisfaction. (ASHRAE 62.1-2004).
- H. Minimum Efficiency Reporting Value (MERV): A filter rating established by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE 52.2-1999, Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size). MERV categories range from 1 (very low efficiency) to 16 (very high).
- I. Rapidly Renewable Materials: Agricultural products, both fiber and animal, that take 10 years or less to grow or raise and can be harvested in a sustainable fashion.
- J. Recycled Content: The proportion, by mass, of preconsumer or postconsumer recycled material in a product (ISO 14021).
1. Postconsumer Recycled Content: The percentage of material in a product that was consumer waste. The recycled material was generated by household, commercial, industrial, or institutional end-users and can no longer be used for its intended purpose. It includes returns of materials from the distribution chain (ISO 14021). Examples include construction and demolition debris, materials collected through recycling programs, discarded products (e.g., furniture, cabinetry, decking), and landscaping waste (e.g., leaves, grass clippings, tree trimmings).
 2. Preconsumer Recycled Content: Formerly known as “postindustrial content”, this is the percentage of material in a product that is recycled from manufacturing waste. Examples include planer shavings, sawdust, bagasse, walnut shells, culls, trimmed materials, overissue publications, and obsolete inventories. Excluded are rework, regrind, or scrap materials capable of being reclaimed within the same process that generated them (ISO 14021).
- K. Recycling: The collection, reprocessing, marketing, and use of materials that were diverted or recovered from the solid waste stream.
- L. Refurbished Materials: Products that could have been disposed of as solid waste. These products have completed their life cycle as consumer items and are then refurbished for reuse without substantial alteration of their form. Refurbishing includes renovating, repairing, restoring, or generally improving the appearance, performance, quality, functionality, or value of a product.
- M. Regional Materials:

1. Regionally Extracted Materials: Raw materials taken from within a 500-mile radius of the Project Site.
 2. Regionally Manufactured Materials: Materials assembled as finished products within a 500-mile radius of the Project Site
 3. Remanufactured Materials: Items that are made into other products. One example is concrete that is crushed and used as subbase.
- N. Reuse: The return of materials to active use in the same or a related capacity as their original use, thus extending the lifetime of materials that would otherwise be discarded.
- O. Salvaged Materials/Reused Materials: Construction materials recovered from existing buildings or construction sites and reused. Common salvaged materials include structural beams and posts, flooring, doors, cabinetry, brick, and decorative items.
- P. Urea-Formaldehyde: A combination of urea and formaldehyde that is used in some glues and may emit formaldehyde at room temperature.
- Q. Verification: The range of checks and tests carried out to determine whether components, subsystems, systems, and interfaces between systems operate in accordance with the Contract Documents.
- R. Volatile Organic Compounds (VOCs): 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 at normal room temperatures.

1.03 REFERENCE STANDARDS

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
1. ASHRAE 52.2-1999: Method of Testing General Ventilation Air-Conditioning Devices for Removal Efficiency by Particle Size.
 2. ASHRAE 55: Thermal Environmental Conditions for Human Occupancy. Atlanta: ASHRAE, 2004.
 3. ASHRAE 62.1: Ventilation for Acceptable Indoor Air Quality, 2004.
 4. ASHRAE Guideline 1: The HVAC Commissioning Process, 1996.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers/Illuminating Engineering Society of North America (ASHRAE/IESNA):
1. ASHRAE/IESNA 90.1: Energy Standard for Buildings except Low-Rise Residential Buildings. Atlanta/New York: ASHRAE/IESNA, 2004.
- C. California Department of Health Services:
1. Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
 - a. Available in PDF at www.cal-iaq.org/VOC/
- D. Carpet and Rug Institute; <http://www.carpet-rug.org/>:
1. CRI 104-2002: Standard for Installation Specification of Commercial Carpet:
 - a. Green Label (testing program).
 - b. Green Label Plus (testing program).
- E. Code of Federal Regulations:
1. 40 CFR 59, Subpart D-2001: National Volatile Organic Compound Emission Standard for Architectural Coatings.
- F. Efficiency Valuation Organization (P.O. Box 23363, Washington, DC 20026-3363):

1. International Performance Measurement and Verification Protocol (IPMVP), Volume III: Concepts and Options for Determining Energy Savings in New Construction, 2003.
 - a. Available in PDF at www.ipmvp.org.
- G. Environmental Protection Agency:
 1. Compendium of Methods for the Determination of Air Pollutants in Indoor Air. April 1990.
 2. Document No. 832R92005: Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices. Washington, DC: EPA, 1992. Available from Department of Commerce, National Technical Information Service, www.ntis.gov; Ch. 3 is available in PDF at www.epa.gov/npdes/pubs/chap03_conguide.pdf
 3. Document No. 840R92002: Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. 1993. (Available from Department of Commerce, National Technical Information Service, www.ntis.gov)
- H. Environmental Protection Agency:
 1. FSC STD-01-001-2004: FSC Principals and Criteria for Stewardship; available in PDF at www.fsc.org.
- I. Green Seal; <http://www.greenseal.org>:
 1. Green Seal GC-03: Green Seal Environmental Standard for Anti-Corrosive Paints, 2nd Edition, January 7, 1997.
 2. Green Seal GS-11: Green Seal Environmental Standard for Paints and Coatings, 1st Edition, May 20, 1993.
 3. Green Seal GS-36: Green Seal Environmental Standard for Commercial Adhesives, 1st Edition, October 9, 2000.
- J. Public Technology Institute/U.S. Green Building Council:
 1. Sustainable Building Technical Manual - Green Building Design, Construction, and Operation. Washington, DC: PTI/USGBC, 1996. (1301 Pennsylvania Ave. NW, Washington, DC 20004; 202-626-2412; available to members of the USGBC in PDF at www.usgbc.org)
- K. Resilient Floor Covering Institute; <http://www.rfci.com>:
 1. FloorScore Program; http://www.rfci.com/int_FloorScore.htm.
- L. Sheet Metal and Air Conditioning Contractors' National Association:
 1. SMACNA IAQ Guideline for Occupied Buildings under Construction. 1995.
- M. South Coast Air Quality Management District; <http://www.aqmd.gov/>:
 1. Rule 1113 - Architectural Coatings.
 2. Rule 1168 - Adhesive and Sealant Applications.
- N. U.S. Green Building Council; <http://www.usgbc.org/>:
 1. LEED Reference Guide for Green Building Design and Construction, Schools 2009 Edition .

1.04 ADMINISTRATIVE SUBMITTALS

- A. Respond to questions and requests from Architect, LEED requirements coordinator (Project LEED AP), and the USGBC regarding LEED credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until the USGBC has made its determination on the project's LEED certification application. Document responses as informational submittals.

1.05 ACTION SUBMITTALS

- A. General: Submit additional LEED submittals required by other Specification Sections.
- B. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.
- C. LEED Documentation Submittals:
 - 1. Credit EA 5 "Measurement and Verification": Product data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy-consumption performance over a period of time of not less than one year of postconstruction occupancy.
 - a. Credit MR 2 "Construction Waste Management": Comply with Section 01 74 19 "Construction Waste Management and Disposal."
 - b. Credit MR 4 "Recycled Content":
 - 1) List of product names, manufacturers' names, costs, percentage postconsumer content, and percentage preconsumer content.
 - 2) Cutsheets or manufacturer's letters to document the listed products' recycled content.
 - 3) List of actual materials costs, excluding labor and equipment, for CSI MasterFormat 2004 Edition Divisions 02-10 only.
 - c. Credit MR 5 "Regional Materials":
 - 1) List of product purchases manufactured, extracted, or harvested regionally.
 - 2) List of manufacturers' names, product costs, distances between the Project and manufacturer, and distances between the Project and the extraction site.
 - 3) Cutsheets that document material origin and manufacture within a 500-mile radius of the Project Site.
 - 4) List of actual materials costs, excluding labor and equipment, for CSI MasterFormat 2004 Edition Divisions 02-10 only.
 - d. Credit MR 6 "Rapidly Renewable Materials":
 - 1) List of rapidly renewable product purchases.
 - 2) List of manufacturers' names, materials costs, the percentage of each product that is rapidly renewable criteria (by weight), and each compliant value.
 - 3) Cutsheets that document rapidly renewable criteria.
 - 4) List of actual materials costs, excluding labor and equipment, for CSI MasterFormat 2004 Edition Divisions 02-10 only.
 - e. Credit MR 7 "Certified Wood": Product data and chain-of-custody (COC) certificates for products containing wood-based materials and products that are certified in accordance with the Forest Stewardship Council's (FSC's) principles and criteria and that are permanently installed in the Project.
 - 1) Each wood product must be identified on a line item basis.
 - 2) FSC products must be identified as such on a line item basis.
 - 3) The dollar value of each line item must be shown.
 - 4) Vendor invoices for each certified wood product. The vendor's COC certificate number must be shown on any invoice that includes FSC certified products.
 - 5) Include statement indicating cost for each certified wood product.
 - f. Credit EQ 3.1 "Construction Indoor Air Quality Plan - During Construction":
 - 1) Construction indoor-air-quality management plan.
 - 2) Product data for temporary filtration media, including MERV rating.
 - 3) Product data for filtration media used during occupancy, including MERV rating.

- 4) Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials.
- g. Credit IEQ 3.2 “Construction Indoor Air Quality Plan - Before Occupancy”:
 - 1) Submit a written construction indoor-air-quality management plan
 - 2) If Air Flush Out:
 - (a) Signed statement describing the building air flush-out procedures including the dates when flush-out was begun and completed, occupancy, outdoor air delivery rates, internal temperature, and humidity as well as any special considerations. Also include a statement that filtration media was replaced after flush-out.
 - (b) Product data for filtration media used during flush-out and during occupancy.
 - 3) If Air Testing:
 - (a) Report from testing and inspecting agency indicating results of indoor-air-quality testing and documentation verifying that all required contaminants are accounted for and reported in the correct unit of measure.
- h. Credit IEQ 4.1 “Low-Emitting Materials - Adhesives & Sealants”:

Submit a list of each indoor adhesive product, sealant, and sealant primer used on the interior of the building (i.e., inside of the weatherproofing system and applied on-site).

 - 1) Include manufacturer's name, product name, and specific VOC data (g/L, less water) for each product, as well as corresponding allowable VOC from the referenced standard.
 - 2) Submit laboratory test reports and other required documentation for each adhesive and sealant installed in the building interior that it meets the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
- i. Credit IEQ 4.2 “Low-Emitting Materials - Paints & Coatings”:

Submit a list of each paint and coating used on the interior of the building (i.e., inside of the weatherproofing system and applied on-site).

 - 1) Include manufacturer's name, product name, and specific VOC data (g/L, less water) for each product, as well as corresponding allowable VOC from the referenced standard.
 - 2) Submit laboratory test reports and other required documentation for each paint and coating installed in the building interior that it meets the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
- j. Credit IEQ 4.3 “Low-Emitting Materials - Flooring Systems”:
 - 1) Submit a list of each carpet, carpet cushion, and carpet adhesive installed in the building interior. Include manufacturer's name and product name. Record the VOC content for each adhesive.
 - 2) Submit a list of each hard surface flooring product, tile setting adhesive, finishes, and grout installed in the building interior. Record the VOC content for each tile setting adhesive and grout.

- 3) Submit laboratory test reports and other required documentation for each flooring element installed in the building interior that it meets the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
- k. Credit IEQ 4.4 "Low-Emitting Materials - Composite Wood & Agrifiber Products":
 - 1) Submit a list of each composite wood and agrifiber product installed in the building interior.
 - 2) Submit product data for each product containing composite wood or agrifiber products or wood glues indicating that each product contains no added urea-formaldehyde resins.
 - 3) Submit product data for each laminating adhesive used to fabricate on-site and shop-applied composite wood and agrifiber assemblies indicating that each does not contain added urea-formaldehyde resins.
 - 4) Submit laboratory test reports and other required documentation for each composite wood and agrifiber product installed in the building interior that it meets the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
- l. Credit IEQ 4.5 "Low-Emitting Materials - Furniture and Furnishings":
 - 1) Submit a list of each Classroom furniture including all student desks, tables, and seats that was manufactured, refurbished or refinished within 1 year prior to occupancy. Salvaged and used furniture that is more than 1 year old at time of the occupancy is excluded from the credit requirements. Include manufacturer's name and product name.
 - 2) Submit required documentation for each furniture element to meet either option 1, 2 or 3.
- m. Credit IEQ 4.6 "Low-Emitting Materials - Ceiling and Wall Systems":
 - 1) Submit a list of all gypsum board, insulation, acoustical ceiling systems and wall coverings installed in the building interior (defined as, inside the weatherproofing system and applied on-site). Include manufacturer's name and product name.
 - 2) Submit laboratory test reports and other required documentation for each product that it meets the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For LEED coordinator.
- B. Project Materials Cost Data: Provide statement indicating total cost for materials used for Project. Costs exclude labor, overhead, and profit. Include breakout of costs for the following categories of items:
 1. Furniture.
 2. Plumbing.
 3. Mechanical.
 4. Electrical.
 5. Specialty items such as elevators and equipment.

6. Wood-based construction materials.
- C. LEED Action Plans: Provide preliminary submittals within 30 days of date established for the Notice to Proceed indicating how the following requirements will be met:
1. Credit MR 2 “Construction Waste Management”: Waste management plan complying with Section 01 74 19 "Construction Waste Management and Disposal."
 2. Credit MR 4 “Recycled Content”: List of proposed materials with recycled content. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
 3. Credit MR 5 “Regional Materials”: List of proposed regional materials. Identify each regional material, including its source, cost, and the fraction by weight that is considered regional.
 4. Credit MR 6 “Rapidly Renewable Materials”: List of proposed rapidly renewable materials. Identify each rapidly renewable material, including its source, cost, and the percentage of each product that is rapidly renewable criteria (by weight), and each compliant value.
 5. Credit MR 7 “Certified Wood”: List of proposed certified wood products. Indicate each product containing certified wood, including its source and cost of certified wood products.
 6. Credit IEQ 3.1 “Construction Indoor Air Quality Plan - During Construction”: Construction indoor-air-quality management plan.
- D. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans for the following:
1. Credit MR 2 “Construction Waste Management”: Waste reduction progress reports complying with Section 01 74 19 "Construction Waste Management and Disposal."
 2. Credit MR 4 “Recycled Content”: Recycled content.
 3. Credit MR 5 “Regional Materials”: Regional materials.
 4. Credit MR 6 “Rapidly Renewable Materials”: Rapidly renewable materials.
 5. Credit MR 7 “Certified Wood”: Certified wood products.

1.07 QUALITY ASSURANCE

- A. LEED Coordinator: Engage an experienced LEED-Accredited Professional to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

- A. Provide products and procedures necessary to obtain LEED credits required in this Section. Although other Sections may specify some requirements that contribute to LEED credits, the Contractor shall determine additional materials and procedures necessary to obtain LEED credits indicated.

2.02 RECYCLED CONTENT OF MATERIALS

- A. Credit MR 4 “Recycled Content”: Building materials shall have recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content for Project constitutes a minimum of 20 percent of cost of materials used for Project.
1. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.

2. Do not include plumbing, mechanical and electrical components, and specialty items such as elevators and equipment in the calculation. Furniture may be included if it is included consistently in MR credits 3-7.

2.03 REGIONAL MATERIALS

- A. Credit MR 5 “Regional Materials”: Not less than 20 percent of building materials (by cost) shall be regional materials.
 1. If only a fraction of a product or material is extracted, harvested, or recovered and manufactured locally, then only that percentage (by weight) must contribute to the regional value.
 2. Do not include plumbing, mechanical and electrical components, and specialty items such as elevators and equipment in the calculation. Furniture may be included if it is included consistently in MR credits 3-7.

2.04 RAPIDLY RENEWABLE MATERIALS

- A. Credit MR 6 “Rapidly Renewable Materials”: Not less than 2.5 percent of the total value of all building materials and products used in the Project, based on cost, shall be rapidly renewable materials.
 1. Furniture may be included if it is included consistently in MR credits 3-7.

2.05 CERTIFIED WOOD

- A. Credit MR 7 “Certified Wood”: Not less than 50 percent (by cost) of wood-based materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
 1. Include only materials permanently installed in the project. Wood Products purchased for temporary use on the project may be included at the project team's discretion. If any such materials are included, all such materials must be included.
 2. Furniture may be included if it is included consistently in MR credits 3-7.
 3. Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:
 - a. Rough carpentry.
 - b. Miscellaneous carpentry.
 - c. Heavy timber construction.
 - d. Wood decking.
 - e. Metal-plate-connected wood trusses.
 - f. Structural glued-laminated timber.
 - g. Finish carpentry.
 - h. Architectural woodwork.
 - i. Wood paneling.
 - j. Wood veneer wall covering.
 - k. Wood flooring.
 - l. Wood lockers.
 - m. Wood cabinets.
 - n. Furniture.

2.06 LOW-EMITTING MATERIALS

- A. Credit IEQ 4.1 “Low-Emitting Materials - Adhesives & Sealants”: All adhesives and sealants installed in the building interior (defined as, inside the weatherproofing system and applied on-site) must meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
1. School projects may chose from IEQ credits 4.1-4.6 for a maximum of 4 points.
- B. Credit IEQ 4.2 “Low-Emitting Materials - Paints & Coatings”: All paints and coatings installed in the building interior (defined as, inside the weatherproofing system and applied on-site) must meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
1. School projects may chose from IEQ credits 4.1-4.6 for a maximum of 4 points.
- C. Credit IEQ 4.3 “Low-Emitting Materials - Flooring Systems”: All flooring elements installed in the building interior (defined as, inside the weatherproofing system and applied on-site) must meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
1. School projects may chose from IEQ credits 4.1-4.6 for a maximum of 4 points.
- D. Credit IEQ 4.4 “Low-Emitting Materials - Composite Wood & Agrifiber Products”: All composite wood and agrifiber products installed in the building interior (defined as, inside the weatherproofing system and applied on-site) must meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
1. School projects may chose from IEQ credits 4.1-4.6 for a maximum of 4 points.
- E. Credit IEQ 4.5 “Low-Emitting Materials - Furniture and Furnishings”: Classroom furniture including all student desks, tables and seats that was manufactured, refurbished or refinished within 1 year prior to occupancy must meet 1 of the following requirements. Salvaged and used furniture that is more than 1 year old at the time of the occupancy is excluded from the credit requirements.
1. Option 1: Furniture and seating must be GREENGUARD Children and Schools certified.
 2. Option 2: Calculated indoor air concentrations that are less than or equal to those listed in the following table for furniture systems and seating determined by a procedure based on the EPA Environmental Technology Verification (ETV) Large Chamber Test Protocol for Measuring Emissions of VOCs and Aldehydes (September 1999) testing protocol conducted in an independent air quality testing laboratory.

Chemical Contaminant	Classroom Furniture	Seating
Total VOC's	0.5 mg/m ³	0.25 mg/m ³
Formaldehyde	50 parts per billion	25 parts per billion
Total aldehydes	100 parts per billion	50 parts per billion
4-Phenlylcyclohexene (4-PCH)	0.0065 mg/m ³	0.00325 mg/m ³

3. Option 3: Calculated indoor air concentrations that are less than or equal to those established in table above for furniture systems and seating determined by a protocol based on ANSI/BIFMA M7.1-2007 and ANSI/BIFMA X7.1-2007 testing protocol conducted in an independent third=party quality testing laboratory.

4. School projects may chose from IEQ credits 4.1-4.6 for a maximum of 4 points.
- F. Credit IEQ 4.6 “Low-Emitting Materials - Ceiling and Wall Systems”: All gypsum board, insulation, acoustical ceiling systems and wall coverings installed in the building interior (defined as, inside the weatherproofing system and applied on-site) must meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
 1. School projects may chose from IEQ credits 4.1-4.6 for a maximum of 4 points.

PART 3 - PRODUCTS

3.01 MEASUREMENT AND VERIFICATION

- A. Credit EA 5 “Measurement and Verification”: Implement measurement and verification plan consistent with either Option B: Energy Conservation Measure Isolation or Option D: Calibrated Simulation, Savings Estimation Method 2 in the EVO's "International Performance Measurement and Verification Protocol (IPMVP), Volume III: Concepts and Options for Determining Energy Savings in New Construction."
- B. If not already in place, install metering equipment to measure energy usage. Monitor, record, and trend log measurements.
- C. Evaluate energy performance and efficiency by comparing actual to predicted performance.
- D. Measurement and verification period shall cover at least one year of postconstruction occupancy.

3.02 CONSTRUCTION WASTE MANAGEMENT

- A. Credit MR 2 "Construction Waste Management": Comply with Section 01 74 19 "Construction Waste Management and Disposal."

3.03 CONSTRUCTION INDOOR-AIR-QUALITY MANGEMENT

- A. Credit IEQ 3.1 “Construction Indoor Air Quality Management Plan - During Construction”: Develop and implement an IAQ management plan for the construction and preoccupancy phases of the building as follows:
 1. During construction, meet or exceed the recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines For Occupied Buildings Under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3).
 2. Protect stored on-site and installed absorptive materials from moisture damage.
 3. If permanently installed air handlers are used during construction period as specified in Section 01 50 00 "Temporary Facilities and Controls," filtration media with a minimum efficiency reporting value (MERV) of 8 must be used at each return air grille, as determined by ASHRAE Standard 52.2-1999 (with errata but without addenda). Replace all filtration media immediately prior to occupancy.
 4. Prohibit smoking inside the building and within 25 feet of building entrances once the building is enclosed.

B. Credit IEQ 3.2 “Construction Indoor Air Quality Management Plan - Before Occupancy”:
Develop an IAQ management plan and implement it after all finishes have been installed and the building has been completely cleaned before occupancy. Comply with one of the following requirements:

1. Flush-Out:

- a. After construction ends, prior to occupancy and with all interior finishes installed, install new filtration media and perform a building flush-out by supplying a total volume of 14,000 cu. ft. of outdoor air per square foot of floor area while maintaining an internal temperature of at least 60 deg F and a relative humidity no higher than 60 percent.
- b. If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cubic feet of outdoor air per square foot of floor area. Once the space is occupied, it must be ventilated at a minimum rate of 0.30 cubic feet per minute (cfm) per square foot of outside air or the design minimum outside air rate determined in Prerequisite EQ 1 “Minimum Air Quality Performance”, whichever is greater. During each day of the flush-out period, ventilation must begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions must be maintained until a total of 14,000 cubic feet per square foot of outside air has been delivered to the space.

2. Air Testing:

- a. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "Green Building Design and Construction Reference Guide, 2009 Edition."
- b. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:

Contaminant	Maximum Concentration
Total Volatile Organic Compounds (TVOC)	500 micrograms per cubic meter
Formaldehyde	27 parts per billion
Particulates (PM10)	50 micrograms per cubic meter
4-Phenylcyclohexene (4-PH)*	6.5 micrograms per cubic meter
Carbon Monoxide (CO)	9 parts per million and no greater than 2 parts per million above outdoor levels
* This test is required only if carpets and fabrics with styrene butadiene rubber (SBR) latex backing are installed as part of the base building systems.	

- c. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the noncompliant concentrations. Repeat until all requirements are met. When retesting noncompliant building areas, take samples from same locations as in the first test, although it is not required.
- d. Conduct the air-sample testing as follows:
 - 1) All measurements shall be conducted prior to occupancy, but during normal occupied hours with the building ventilation system started at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.
 - 2) All interior finishes must be installed, including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Movable furnishings such as

workstations and partitions should be in place for the testing, although it is not required.

- 3) The number of sampling locations will depend on the size of building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 square feet or for each contiguous floor area, whichever is larger. Include areas with the least ventilation and greatest presumed source strength.
- 4) Air samples must be collected between 3 and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

END OF SECTION

SECTION 01 91 13

GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes general requirements that apply to implementation of commissioning without regard to systems, subsystems, and equipment being commissioned.
- B. Related Sections include the following:
 - 1. Division 01 Section "*HVAC Commissioning Requirements*" for specific requirements for commissioning HVAC systems.
 - 2. Division 01 Section "*Electrical Commissioning Requirements*" for specific requirements for commissioning electrical systems.
 - 3. Division 01 Section "*Plumbing System Commissioning Requirements*" for specific requirements for commissioning Plumbing systems.
 - 4. Division 01 Section "*Contract Closeout*" for specific requirements for closeout at substantial and final completion.
 - 5. Division 01 Section "*Contract Closeout*" for Specific Requirements for training and demonstration of systems to Owner.
 - 6. Division 01 Section "*Contract Closeout*" for Specific Requirements related to the Preparation of systems operation and maintenance manuals.

1.03 DEFINITIONS

- A. CxA: Commissioning Authority.
- B. OPR: Owner's Project Requirements.
- C. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.
- D. TAB: Testing, Adjusting, and Balancing.

1.04 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s): Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.
- B. Members Appointed by Owner:
 - 1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract. The CxA for this project shall be performed by EMO Energy Solution, 3141 Fairview Park Drive, Suite 450, Falls Church, Virginia 22042, (703) 205-0445-telephone, (703) 205-0449-fax.
 - 2. Representatives of the facility user and operation and maintenance personnel.
 - 3. Architect and engineering design professionals.

1.05 OWNER'S RESPONSIBILITIES

- A. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities including, but not limited to, the following:
 - 1. Coordination meetings.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Testing meetings.
 - 4. Demonstration of operation of systems, subsystems, and equipment.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Provide utility services required for the commissioning process.
- B. Contractor shall assign representatives with expertise and authority to act on behalf of the Contractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
 - 1. Participate in commissioning and construction-phase coordination meetings.
 - 2. Participate in maintenance orientation and inspection.
 - 3. Participate in operation and maintenance training sessions.
 - 4. Participate in final review at acceptance meeting.
 - 5. Certify that Work is complete and systems are operational according to the Contract Documents, including calibration of instrumentation and controls.
 - 6. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 - 7. Review and approve final commissioning documentation.
 - 8. Certify that all pre-test work is complete and operational prior to scheduling performed testing by CxA.

- C. Subcontractors shall assign representatives with expertise and authority to act on behalf of subcontractors and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
1. Participate in commissioning and construction-phase coordination meetings.
 2. Participate in maintenance orientation and inspection.
 3. Participate in procedures meeting for testing.
 4. Participate in final review at acceptance meeting.
 5. Provide schedule for operation and maintenance data submittals, equipment startup, and testing to CxA for incorporation into the commissioning plan. Update schedule on a weekly basis throughout the construction period.
 6. Provide information to the CxA for developing construction-phase commissioning plan.
 7. Participate in training sessions for Owner's operation and maintenance personnel.
 8. Provide updated Project Record Documents to the CxA on a daily basis.
 9. Gather and submit operation and maintenance data for systems, subsystems, and equipment to the CxA, as specified in Division 01 Section "Operation and Maintenance Data."
 10. Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures and participate in testing of installed systems, subsystems, and equipment.

1.07 CxA'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Prepare a construction-phase commissioning plan. Collaborate with Contractor and with subcontractors to develop test and inspection procedures. Include design changes and scheduled commissioning activities coordinated with overall Project schedule. Identify commissioning team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task.
- C. Convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss progress of the commissioning processes. Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The CxA shall prepare and distribute minutes to commissioning team members and attendees within five workdays of the commissioning meeting.
- D. At a mutually agreed upon time, conduct an initial construction-phase coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for operation and maintenance submittals; operation and maintenance training sessions; TAB Work; and Project completion.
- E. Observe and inspect construction and report progress and deficiencies. In addition to compliance with the Contract Documents, inspect systems and equipment installation for adequate accessibility for maintenance and component replacement or repair.
- F. Prepare Project-specific test and inspection procedures and checklists.
- G. Schedule, direct, witness, and document tests, inspections, and systems startup.

- H. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.
- I. Certify date of acceptance and startup for each item of equipment for start of warranty periods.
- J. Review Project Record Documents for accuracy. Request revisions from Contractor to achieve accuracy. Project Record Documents requirements are specified in Division 01 Section "Project Record Documents."
- K. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the Contract Documents. Operation and maintenance documentation requirements are specified in Division 01 Section "Operation and Maintenance Data."
- L. Assemble the final commissioning documentation, including the commissioning report and Project Record Documents.

1.08 COMMISSIONING DOCUMENTATION

- A. Commissioning Plan: A document, prepared by CxA, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process, and shall include, but is not limited to the following:
 - 1. Plan for delivery and review of submittals, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the commissioning processes. Submittal dates shall include the latest date approved submittals must be received without adversely affecting commissioning plan.
 - 2. Description of the organization, layout, and content of commissioning documentation (including systems manual) and a detailed description of documents to be provided along with identification of responsible parties.
 - 3. Identification of systems and equipment to be commissioned.
 - 4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.
 - 5. Identification of items that must be completed before the next operation can proceed.
 - 6. Description of responsibilities of commissioning team members.
 - 7. Description of observations to be made.
 - 8. Description of requirements for operation and maintenance training, including required training materials.
 - 9. Description of expected performance for systems, subsystems, equipment, and controls.
 - 10. Schedule for commissioning activities with specific dates coordinated with overall construction schedule.
 - 11. Identification of installed systems, subsystems, and equipment, including design changes that occurred during the construction phase.
 - 12. Process and schedule for documenting changes on a continuous basis to appear in Project Record Documents.
 - 13. Process and schedule for completing prestart and startup checklists for systems, subsystems, and equipment to be verified and tested.
 - 14. Step-by-step procedures for testing systems, subsystems, and equipment with descriptions for methods of verifying relevant data, recording the results obtained, and listing parties involved in performing and verifying tests.

- B. Test Checklists: CxA, with assistance of Contractor and Subcontractors, shall develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. Prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Provide space for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in Division 01 Section "HVAC Commissioning Requirements", "Electrical Commissioning Requirements" and "Plumbing System Commissioning Requirements." Test checklists will be jointly developed as the project progresses. Each checklist, regardless of system, subsystem, or equipment being tested, shall include, but not be limited to, the following:
1. Name and identification code of tested item.
 2. Test number.
 3. Time and date of test.
 4. Indication of whether the record is for a first test or retest following correction of a problem or issue.
 5. Dated signatures of the person performing test and of the witness, if applicable.
 6. Individuals present for test.
 7. Deficiencies.
 8. Issue number, if any, generated as the result of test.
- C. Certificate of Readiness: Certificate of Readiness shall be signed by Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing. Completed test checklists signed by the responsible parties shall accompany this certificate.
- D. Test and Inspection Reports: CxA shall record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application shall be included with data. CxA shall compile test and inspection reports and test and inspection certificates and include them in systems manual and commissioning report.
- E. Corrective Action Documents: CxA shall document corrective action taken for systems and equipment that fail tests. Include required modifications to systems and equipment and revisions to test procedures, if any. Retest systems and equipment requiring corrective action and document retest results.
- F. Issues Log: CxA shall prepare and maintain an issues log that describes design, installation, and performance issues that are at variance with the Contract Documents. Identify and track issues as they are encountered, documenting the status of unresolved and resolved issues.
1. Creating an Issues Log Entry:
 - a. Identify the issue with unique numeric or alphanumeric identifier by which the issue may be tracked.
 - b. Assign a descriptive title of the issue.
 - c. Identify date and time of the issue.
 - d. Identify test number of test being performed at the time of the observation, if applicable, for cross-reference.
 - e. Identify system, subsystem, and equipment to which the issue applies.
 - f. Identify location of system, subsystem, and equipment.
 - g. Include information that may be helpful in diagnosing or evaluating the issue.

- h. Note recommended corrective action.
 - i. Identify commissioning team member responsible for corrective action.
 - j. Identify expected date of correction.
 - k. Identify person documenting the issue.
 2. Documenting Issue Resolution:
 - a. Log date correction is completed or the issue is resolved.
 - b. Describe corrective action or resolution taken. Include description of diagnostic steps taken to determine root cause of the issue, if any.
 - c. Identify changes to the Contract Documents that may require action.
 - d. State that correction was completed and system, subsystem, and equipment is ready for retest, if applicable.
 - e. Identify person(s) who corrected or resolved the issue.
 - f. Identify person(s) documenting the issue resolution.
 3. Issues Log Report: On a periodic basis, but not less than for each commissioning team meeting, CxA shall prepare a written narrative for review of outstanding issues and a status update of the issues log. As a minimum, CxA shall include the following information in the issues log and expand it in the narrative:
 - a. Issue number and title.
 - b. Date of the identification of the issue.
 - c. Name of the commissioning team member assigned responsibility for resolution.
 - d. Expected date of correction.
- G. Commissioning Report: CxA shall document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment. The commissioning report shall indicate whether systems, subsystems, and equipment have been completed and are performing according to the Contract Documents. The commissioning report shall include, but is not limited to, the following:
 1. Lists and explanations of substitutions; compromises; variances in the Contract Documents; record of conditions; and, if appropriate, recommendations for resolution. This report shall be used to evaluate systems, subsystems, and equipment and shall serve as a future reference document during Owner occupancy and operation. It shall describe components and performance that exceed requirements of the Contract Documents and those that do not meet requirements of the Contract Documents. It may also include a recommendation for accepting or rejecting systems, subsystems, and equipment.
 2. Commissioning plan.
 3. Testing plans and reports.
 4. Corrective modification documentation.
 5. Issues log.
 6. Completed test checklists.
 7. Listing of off-season test(s) not performed and a schedule for their completion.
- H. Systems Manual: CxA shall gather required information and compile systems manual. Systems manual shall include, but is not limited to, the following:
 1. Project Record Documents as specified in Division 01 Section "Project Record Documents."
 2. Final commissioning plan.

3. Commissioning report.
4. Operation and maintenance data as specified in Division 01 Section "Operation and Maintenance Data."

1.09 SUBMITTALS

- A. Test Checklists and Report Forms: CxA shall submit sample checklists and forms to Contractor quality-control manager and subcontractors for review and comment. Submit two copies of each checklist and report form.
- B. Test and Inspection Reports: CxA shall submit test and inspection reports.
- C. Corrective Action Documents: CxA shall submit corrective action documents.

1.10 QUALITY ASSURANCE

- A. Instructor Qualifications: Factory-authorized service representatives, experienced in training, operation, and maintenance procedures for installed systems, subsystems, and equipment.
- B. Test Equipment Calibration: Comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been calibrated within six months prior to use.

1.11 COORDINATION

- A. Coordinating Meetings: CxA shall conduct coordination meetings of the commissioning team to review progress on the commissioning plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities.
- B. Pretesting Meetings: CxA shall conduct pretest meetings of the commissioning team to review startup reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.
- C. Testing Coordination: CxA shall coordinate sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- D. Manufacturers' Field Services: CxA and Contractor shall coordinate services of manufacturers' field services.

1.12 ALTERNATES

- A. Refer to Division 01, *-Alternates* for description of work under this section affected by alternates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 OPERATION AND MAINTENANCE TRAINING REQUIREMENTS

- A. Training Preparation Conference: Before operation and maintenance training, CxA shall convene a training preparation conference to include Owner's operation and maintenance personnel, Contractor, and subcontractors. In addition to requirements specified in Division 01 Section "Demonstration and Training," perform the following:
1. Review installed systems, subsystems, and equipment.
 2. Review instructor qualifications.
 3. Review instructional methods and procedures.
 4. Review training module outlines and contents.
 5. Review course materials (including operation and maintenance manuals).
 6. Inspect and discuss locations and other facilities required for instruction.
 7. Review and finalize training schedule and verify availability of educational materials, instructors, audiovisual equipment, and facilities needed to avoid delays.
 8. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.
- B. Training Modules: Develop an instruction program that includes individual training modules for each system, subsystem, and equipment as specified in Division 01 Section "Demonstration and Training."

END OF SECTION

SECTION 019114

PLUMBING COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes requirements for commissioning the plumbing system and its subsystems and equipment. This Section supplements the general requirements specified in Division 01 Section "General Commissioning Requirements."
- B. Related Sections include the following:
 - 1. Division 01 Section "General Commissioning Requirements" for general requirements for commissioning processes that apply to this Section.
- C. The following systems and/or equipment shall be commissioned:
 - 1. Domestic hot water re-circulating system.
 - 2. Domestic hot water heaters.
 - 3. Backflow preventers.
 - 4. Plumbing Fixtures.
 - 5. Domestic water meter (including interlock to ATC system).
 - 6. Thermostatic mixing valves below hand sinks/lavs.
 - 7. Trap priming stations.
 - 8. Shower head flow rates.

1.03 DEFINITIONS

- A. Architect: Includes Architect identified in the Contract for Construction between Owner and Contractor, plus consultant/design professionals responsible for design of plumbing systems, electrical, communications, controls for plumbing systems, and other related systems.
- B. CxA: Commissioning Authority.
- C. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.
- D. TAB: Testing, Adjusting, and Balancing.

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. The following responsibilities are in addition to those specified in Division 01 Section "General Commissioning Requirements."
- B. Contractor:
 - 1. Attend procedures meeting for TAB Work.
 - 2. Certify that TAB Work is complete.
- C. Mechanical Contractor:
 - 1. Attend TAB verification testing.
 - 2. Provide measuring instruments and logging devices to record test data, and data acquisition equipment to record data for the complete range of testing for the required test period.
- D. HVAC Instrumentation and Control Contractor: With the CxA, review control designs for compliance with the Contract Documents, controllability with respect to actual equipment to be installed, and recommend adjustments to control designs and sequence of operation descriptions.
- E. TAB Subcontractor:
 - 1. Contract Documents Review: With the CxA, review the Contract Documents before developing TAB procedures.
 - a. Verify the following:
 - 1) Accessibility of equipment and components required for TAB Work.
 - 2) Adequate number and placement of duct balancing dampers to allow proper balancing while minimizing sound levels in occupied spaces.
 - 3) Adequate number and placement of balancing valves to allow proper balancing and recording of water flow.
 - 4) Adequate number and placement of test ports and test instrumentation to allow reading and compilation of system and equipment performance data needed to conduct both TAB and commissioning testing.
 - 5) Air and water flow rates have been specified and compared to central equipment output capacities.
 - b. Identify discontinuities and omissions in the Contract Documents.
 - c. This review of the Contract Documents by the TAB Subcontractor satisfies requirements for a design review report as specified in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing."
 - 2. Additional Responsibilities: Participate in tests specified in Division 23 Sections "Instrumentation & Controls of HVAC & Plumbing Systems."
- F. Electrical Contractor:

1. With the Mechanical Contractor, coordinate installations and connections between and among electrical and plumbing systems, subsystems, and equipment.
2. Attend TAB verification testing.

1.05 COMMISSIONING DOCUMENTATION

- A. The following are in addition to documentation specified in Division 01 Section "General Commissioning Requirements."
- B. Test Checklists: CxA with assistance of Contractor shall develop test checklists for plumbing systems, subsystems, and equipment, including interfaces and interlocks with other systems. CxA shall prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. In addition to the requirements specified in Division 01 Section "General Commissioning Requirements," checklists shall include, but not be limited to, the following:
 1. Calibration of sensors and sensor function.
 2. Testing conditions under which test was conducted, including (as applicable) ambient conditions, set points, override conditions, and status and operating conditions that impact the results of test.
 3. Control sequences for plumbing systems.
 4. Strength of control signal for each set point at specified conditions.
 5. Responses to control signals at specified conditions.
 6. Sequence of response(s) to control signals at specified conditions.
 7. Electrical demand or power input at specified conditions.
 8. Power quality and related measurements.
 9. Expected performance of systems, subsystems, and equipment at each step of test.
 10. Narrative description of observed performance of systems, subsystems, and equipment. Notation to indicate whether the observed performance at each step meets the expected results.
 11. Interaction of auxiliary equipment.
 12. Issues log.

1.06 SUBMITTALS

- A. The following submittals are in addition to those specified in Division 01 Section "General Commissioning Requirements."
- B. Testing Procedures: CxA shall submit detailed testing plan, procedures, and checklists for each series of tests. Submittals shall include samples of data reporting sheets that will be part of the reports.
- C. Certificate of Readiness: CxA shall compile certificates of readiness from Contractor certifying that systems, subsystems, equipment, and associated controls are ready for testing.
- D. Certificate of Completion of Installation, Prestart, and Startup: CxA shall certify that installation, prestart, and startup activities have been completed. Certification shall include completed checklists provided by TAB Subcontractor as specified in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing."

- E. Certified Pipe Cleaning and Flushing Report: CxA shall certify that pipe cleaning, flushing, hydrostatic testing, and chemical treating have been completed.
- F. Test and Inspection Reports: CxA shall compile and submit test and inspection reports and certificates, and shall include them in systems manual and commissioning report.
- G. Corrective Action Documents: CxA shall submit corrective action documents.
- H. Certified TAB Reports: CxA shall submit verified, certified TAB reports.
- I. LEED Submittal:
 - 1. Product Data for Credit MR 4.1 (and Credit MR4.2): For products having recycled content, required documentation for LEED submittal indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content. See Division 01 Sections related to LEED.
 - 2. Product Data for Credit MR 5.1 (and MR 5.2): For product manufactured, assembled, or extracted within 500 miles of project site, documentation as required for LEED submittal. Include statement indicating costs for each product that is regional. See Division 01 Sections related to LEED.

1.07 ALTERNATES

- A. Refer to Division 01 Section, “Alternates” for description of work under this section affected by alternates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TESTING PREPARATION

- A. Prerequisites for Testing:
 - 1. Certify that plumbing systems, subsystems, and equipment have been completed, calibrated, and started; are operating according to the Contract Documents; and that Certificates of Readiness are signed and submitted.
 - 2. Certify that plumbing instrumentation and control systems have been completed and calibrated; are operating according to the Contract Documents; and that pretest set points have been recorded.
 - 3. Certify that plumbing procedures have been completed, and that TAB reports have been submitted, discrepancies corrected, and corrective work approved.
 - 4. Test systems and intersystem performance after approval of test checklists for systems, subsystems, and equipment.

5. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shut down, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
 6. Verify each operating cycle after it has been running for a specified period and is operating in a steady-state condition.
 7. Inspect and verify the position of each device and interlock identified on checklists. Sign off each item as acceptable, or failed. Repeat this test for each operating cycle that applies to system being tested.
 8. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
 9. Annotate checklist or data sheet when a deficiency is observed.
 10. Verify equipment interface with monitoring and control system and TAB criteria; include the following:
 - a. Flow rates for domestic re-circulating systems.
 - b. Discharge temperatures of water heaters.
 - c. Re-circ. pump pressures and flow rates.
 - d. Domestic water meter total volume in gallons.
 - e. Flow rates in gallons per minute for showerheads.
 - f. Trap priming station water discharge.
 - g. Water heater temperatures and set points.
 11. Verify proper responses of monitoring and control system controllers and sensors to include the following:
 - a. For each controller or sensor, record the indicated monitoring and control system reading and the test instrument reading. If initial test indicates that the test reading is outside of the control range of the installed device, check calibration of the installed device and adjust as required. Retest malfunctioning devices and record results on checklist or data sheet.
 - b. Report deficiencies and prepare an issues log entry.
 12. Verify that plumbing equipment field quality-control testing has been completed and approved. CxA shall direct, witness, and document field quality-control tests, inspections, and startup specified in individual Division 22 Sections.
 13. Verify flow rates of all aerators.
 14. Verify the operation of all plumbing fixtures.
- B. Testing Instrumentation: Install measuring instruments and logging devices to record test data for the required test period. Instrumentation shall monitor and record full range of operating conditions and shall allow for calculation of total capacity of system for each mode of operation. Operational modes include the following:

1. Occupied and unoccupied.
2. Emergency power supply.
3. Life-safety and safety systems.
4. Temporary upset of system operation.
5. Partial occupancy conditions.
6. Special cycles.
7. Alarm conditions.

3.02 TAB VERIFICATION

- A. TAB Subcontractor shall coordinate with CxA for work required in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing." TAB Subcontractor shall copy CxA with required reports, sample forms, checklists, and certificates.
- B. Contractor, Plumbing Contractor, and CxA shall witness TAB Work.
- C. TAB Preparation:
 1. TAB Subcontractor shall provide CxA with data required for "Pre-Field TAB Engineering Reports" specified in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing."
 - a. CxA shall use this data to certify that prestart and startup activities have been completed for systems, subsystems, and equipment installation.
- D. Verification of Final TAB Report:
 1. CxA shall select, at random, 10 percent of report for field verification.
 2. CxA shall notify TAB Subcontractor 10 days in advance of the date of field verification; however, notice shall not include data points to be verified. The TAB Subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
 3. Failure of an item is defined as follows:
 - a. A deviation of more than 10 percent.
 4. Failure of more than 10 percent of selected items shall result in rejection of final TAB report.
- E. If deficiencies are identified during verification testing, CxA shall notify the HVAC Contractor and Architect, and shall take action to remedy the deficiency. Architect shall review final tabulated checklists and data sheets to determine if verification is complete and that system is operating according to the Contract Documents.
- F. CxA shall certify that TAB Work has been successfully completed.

3.03 TESTING

- A. Test systems and intersystem performance after test checklists for systems, subsystems, and equipment have been approved.
- B. Perform tests using design conditions whenever possible.
 - 1. Simulate conditions by imposing an artificial load when it is not practical to test under design conditions and when written approval for simulated conditions is received from CxA. Before simulating conditions, calibrate testing instruments. Set and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.
 - 2. Alter set points when simulating conditions is not practical and when written approval is received from CxA.
 - 3. Alter sensor values with a signal generator when design or simulating conditions and altering set points are not practical. Do not use sensor to act as signal generator to simulate conditions or override values.
- C. Scope of Plumbing Contractor Testing:
 - 1. Testing scope shall include entire plumbing installation, from central hot water heating equipment for heat generation through distribution systems to each fixture. It shall include measuring capacities and effectiveness of operational and control functions.
 - 2. Test all operating modes, interlocks, control responses, responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
 - 3. Test all plumbing fixtures.
 - 4. Test time to reach temperature and temperature of hot water at all fixtures with thermostatic mixing valves.
 - 5. Test discharge of water at all trap priming stations.
 - 6. Verify that all backflow preventers have been tested. Document in writing.
 - 7. Test operation of all water meters.
 - 8. Test domestic water heaters.
 - 9. Test water meters and interlock with ATC system.
 - 10. Test operation, set points, and safeties of water heaters.
- D. Detailed Testing Procedures: CxA, with Plumbing Contractor, TAB Subcontractor, and Plumbing Instrumentation and Control Contractor, shall prepare detailed testing plans, procedures, and checklists for plumbing systems, subsystems, and equipment.
- E. HVAC Instrumentation and Control System Testing:
 - 1. Field testing plans and testing requirements are specified in Division 23 Section "Instrumentation & Controls of HVAC & Plumbing Systems." The CxA, Plumbing Contractor, and the HVAC Instrumentation and Control Contractor shall collaborate to prepare testing plans.
 - 2. CxA shall convene a meeting of appropriate entities to review test report of HVAC instrumentation and control systems.
- F. Plumbing System Testing: Plumbing Contractor shall prepare a testing plan to verify performance of water heaters, domestic re-circulating systems, backflow preventers, plumbing

fixtures, trap priming stations, domestic pumps, domestic water meters, and thermostatic mixing valves. Plan shall include the following:

1. Sequence of testing and testing procedures for each item of equipment and section of pipe to be tested, identified by identification marker. Markers shall be keyed to Drawings for each pipe sector showing the physical location of each item of equipment and pipe test section. Drawings shall be formatted to allow each item of equipment and section of piping to be physically located and identified when referred to in the system testing plan.
2. Tracking checklist for managing and ensuring that all pipe sections have been tested.
3. Design and actual measurements for all equipment.

G. Deferred Testing:

1. If tests cannot be completed because of a deficiency outside the scope of the plumbing system, the deficiency shall be documented and reported to Owner. Deficiencies shall be resolved and corrected by appropriate parties and test rescheduled.
2. If the testing plan indicates specific seasonal testing, appropriate initial performance tests shall be completed and documented and additional tests scheduled.

H. Testing Reports:

1. Reports shall include measured data, data sheets, and a comprehensive summary describing the operation of systems at the time of testing.
2. Include data sheets for each controller to verify proper operation of the control system, the system it serves, the service it provides, and its location. For each controller, provide space for recording its readout, the reading at the controller's sensor(s), plus comments. Provide space for testing personnel to sign off on each data sheet.
3. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.

END OF SECTION

SECTION 01 91 15

HVAC COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes requirements for commissioning the HVAC system and its subsystems and equipment. This Section supplements the general requirements specified in Division 01 Section "General Commissioning Requirements."
- B. Related Sections include the following:
 - 1. Division 01 Section "General Commissioning Requirements" for general requirements for commissioning processes that apply to this Section.
- C. The following systems and/or equipment shall be commissioned:
 - 1. Exhaust air systems.
 - 2. HVAC controls and sequences of operation.
 - 3. Energy recovery ventilators (Including variable frequency drives).
 - 4. Air flow monitoring station.
 - 5. Ductless heat pumps.
 - 6. Exhaust Fans and ventilation fans.
 - 7. Automatic Temperature Control System.
 - 8. Variable refrigerant volume systems (indoor and outdoor units).
 - 9. Variable refrigerant volume system ATC interface and systems integration.
 - 10. Water meter/ATC interface.
 - 11. Duct detectors.
 - 12. Electric Heaters.

1.03 DEFINITIONS

- A. Architect: Includes Architect identified in the Contract for Construction between Owner and Contractor, plus consultant/design professionals responsible for design of HVAC, electrical, communications, controls for HVAC systems, and other related systems.
- B. CxA: Commissioning Authority.

- C. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.
- D. TAB: Testing, Adjusting, and Balancing.

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. The following responsibilities are in addition to those specified in Division 01 Section "General Commissioning Requirements."
- B. Contractor:
 - 1. Attend procedures meeting for TAB Work.
 - 2. Certify that TAB Work is complete.
- C. Mechanical Contractor:
 - 1. Attend TAB verification testing.
 - 2. Provide measuring instruments and logging devices to record test data, and data acquisition equipment to record data for the complete range of testing for the required test period.
- D. HVAC Instrumentation and Control Contractor: With the CxA, review control designs for compliance with the Contract Documents, controllability with respect to actual equipment to be installed, and recommend adjustments to control designs and sequence of operation descriptions.
- E. TAB Subcontractor:
 - 1. Contract Documents Review: With the CxA, review the Contract Documents before developing TAB procedures.
 - a. Verify the following:
 - 1) Accessibility of equipment and components required for TAB Work.
 - 2) Adequate number and placement of duct balancing dampers to allow proper balancing while minimizing sound levels in occupied spaces.
 - 3) Adequate number and placement of balancing valves to allow proper balancing and recording of water flow.
 - 4) Adequate number and placement of test ports and test instrumentation to allow reading and compilation of system and equipment performance data needed to conduct both TAB and commissioning testing.
 - 5) Air and water flow rates have been specified and compared to central equipment output capacities.
 - b. Identify discontinuities and omissions in the Contract Documents.
 - c. This review of the Contract Documents by the TAB Subcontractor satisfies requirements for a design review report as specified in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing."

2. Additional Responsibilities: Participate in tests specified in Division 23 Sections "Instrumentation & Controls of HVAC & Plumbing Systems."

F. Electrical Contractor:

1. With the Mechanical Contractor, coordinate installations and connections between and among electrical and HVAC systems, subsystems, and equipment.
2. Attend TAB verification testing.

1.05 COMMISSIONING DOCUMENTATION

- A. The following are in addition to documentation specified in Division 01 Section "General Commissioning Requirements."

- B. Test Checklists: CxA with assistance of Contractor shall develop test checklists for HVAC systems, subsystems, and equipment, including interfaces and interlocks with other systems. CxA shall prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. In addition to the requirements specified in Division 01 Section "General Commissioning Requirements," checklists shall include, but not be limited to, the following:

1. Calibration of sensors and sensor function.
2. Testing conditions under which test was conducted, including (as applicable) ambient conditions, set points, override conditions, and status and operating conditions that impact the results of test.
3. Control sequences for HVAC systems.
4. Strength of control signal for each set point at specified conditions.
5. Responses to control signals at specified conditions.
6. Sequence of response(s) to control signals at specified conditions.
7. Electrical demand or power input at specified conditions.
8. Power quality and related measurements.
9. Expected performance of systems, subsystems, and equipment at each step of test.
10. Narrative description of observed performance of systems, subsystems, and equipment. Notation to indicate whether the observed performance at each step meets the expected results.
11. Interaction of auxiliary equipment.
12. Issues log.

1.06 SUBMITTALS

- A. The following submittals are in addition to those specified in Division 01 Section "General Commissioning Requirements."

- B. Testing Procedures: CxA shall submit detailed testing plan, procedures, and checklists for each series of tests. Submittals shall include samples of data reporting sheets that will be part of the reports.

- C. Certificate of Readiness: CxA shall compile certificates of readiness from Contractor certifying that systems, subsystems, equipment, and associated controls are ready for testing.

- D. Certificate of Completion of Installation, Prestart, and Startup: CxA shall certify that installation, prestart, and startup activities have been completed. Certification shall include completed checklists provided by TAB Subcontractor as specified in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing."
- E. Test and Inspection Reports: CxA shall compile and submit test and inspection reports and certificates, and shall include them in systems manual and commissioning report.
- F. Corrective Action Documents: CxA shall submit corrective action documents.
- G. Certified TAB Reports: CxA shall submit verified, certified TAB reports.
- H. LEED Submittal:
 - 1. Product Data for Credit MR 4.1 (and Credit MR4.2): For products having recycled content, required documentation for LEED submittal indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content. See Division 01 Sections related to LEED.
 - 2. Product Data for Credit MR 5.1 (and MR 5.2): For product manufactured, assembled, or extracted within 500 miles of project site, documentation as required for LEED submittal. Include statement indicating costs for each product that is regional. See Division 01 Sections related to LEED.

1.07 ALTERNATES

- A. Refer to Division 01, *-Alternates* for description of work under this section affected by alternates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TESTING PREPARATION

- A. Prerequisites for Testing:
 - 1. Certify that HVAC systems, subsystems, and equipment have been completed, calibrated, and started; are operating according to the Contract Documents; and that Certificates of Readiness are signed and submitted.
 - 2. Certify that HVAC instrumentation and control systems have been completed and calibrated; are operating according to the Contract Documents; and that pretest set points have been recorded.
 - 3. Certify that TAB procedures have been completed, and that TAB reports have been submitted, discrepancies corrected, and corrective work approved.

4. Test systems and intersystem performance after approval of test checklists for systems, subsystems, and equipment.
 5. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shut down, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
 6. Verify each operating cycle after it has been running for a specified period and is operating in a steady-state condition.
 7. Inspect and verify the position of each device and interlock identified on checklists. Sign off each item as acceptable, or failed. Repeat this test for each operating cycle that applies to system being tested.
 8. Check safety cutouts, alarms, and interlocks with duct detectors and life-safety systems during each mode of operation.
 9. Annotate checklist or data sheet when a deficiency is observed.
 10. Verify equipment interface with monitoring and control system and TAB criteria; include the following:
 - a. Supply and return flow rates for ERV and constant volume systems in each operational mode.
 - b. Operation of heat pump units in both heating and cooling cycles.
 - c. Minimum outdoor-air intake in each operational mode and at minimum and maximum airflows.
 - d. Total exhaust airflow and total outdoor-air intake.
 - e. Supply, outside air, exhaust and return air flow rates for ERVs in each operating mode.
 - f. Sequences of operation of all HVAC equipment.
 - g. Ductless heat pumps and air conditioning units with air flow rates and temperatures.
 - h. Variable speed drive parameters at each operated mode.
 - i. Electric heating equipment volts, amps, and temperature rise.
 - j. Supply and return air flow rates for ERV units.
 - k. Operation/Accuracy of air flow measuring stations at various flow rates.
 - l. Operation of variable refrigerant flow systems in all modes.
 11. Verify proper responses of monitoring and control system controllers and sensors to include the following:
 - a. For each controller or sensor, record the indicated monitoring and control system reading and the test instrument reading. If initial test indicates that the test reading is outside of the control range of the installed device, check calibration of the installed device and adjust as required. Retest malfunctioning devices and record results on checklist or data sheet.
 - b. Report deficiencies and prepare an issues log entry.
 12. Verify that HVAC equipment field quality-control testing has been completed and approved. CxA shall direct, witness, and document field quality-control tests, inspections, and startup specified in individual Division 23 Sections.
- B. Testing Instrumentation: Install measuring instruments and logging devices to record test data for the required test period. Instrumentation shall monitor and record full range of operating conditions and shall allow for calculation of total capacity of system for each mode of

operation. For individual room cooling tests, provide temporary heaters to impose a cooling load. Operational modes include the following:

1. Heating/Cooling Mode.
2. Occupied and unoccupied.
3. Warm up and cool down.
4. Life-safety and safety systems.
5. Duct detectors.
6. Fire safety.
7. Temporary upset of system operation.
8. Partial occupancy conditions.
9. Special cycles.
10. ERV supply/exhaust flow at partial CO2 levels.
11. Variable refrigerant volume units in heating/cooling modes.

3.02 TAB VERIFICATION

- A. TAB Subcontractor shall coordinate with CxA for work required in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing." TAB Subcontractor shall copy CxA with required reports, sample forms, checklists, and certificates.
- B. Contractor, HVAC Contractor, and CxA shall witness TAB Work.
- C. TAB Preparation:
 1. TAB Subcontractor shall provide CxA with data required for "Pre-Field TAB Engineering Reports" specified in Division 23 Section "Testing Adjusting & Balancing for HVAC & Plumbing."
 - a. CxA shall use this data to certify that prestart and startup activities have been completed for systems, subsystems, and equipment installation.
- D. Verification of Final TAB Report:
 1. CxA shall select, at random, 10 percent of report for field verification.
 2. CxA shall notify TAB Subcontractor 10 days in advance of the date of field verification; however, notice shall not include data points to be verified. The TAB Subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
 3. Failure of an item is defined as follows:
 - a. For all readings a deviation of more than 10 percent.
 4. Failure of more than 10 percent of selected items shall result in rejection of final TAB report.
- E. If deficiencies are identified during verification testing, CxA shall notify the HVAC Contractor and Architect, and shall take action to remedy the deficiency. Architect shall review final tabulated checklists and data sheets to determine if verification is complete and that system is operating according to the Contract Documents.

- F. CxA shall certify that TAB Work has been successfully completed.

3.03 TESTING

- A. Test systems and intersystem performance after test checklists for systems, subsystems, and equipment have been approved.
- B. Perform tests using design conditions whenever possible.
 - 1. Simulate conditions by imposing an artificial load when it is not practical to test under design conditions and when written approval for simulated conditions is received from CxA. Before simulating conditions, calibrate testing instruments. Set and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.
 - 2. Alter set points when simulating conditions is not practical and when written approval is received from CxA.
 - 3. Alter sensor values with a signal generator when design or simulating conditions and altering set points are not practical. Do not use sensor to act as signal generator to simulate conditions or override values.
- C. Scope of HVAC Contractor Testing:
 - 1. Testing scope shall include entire HVAC installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. It shall include measuring capacities and effectiveness of operational and control functions.
 - 2. Test all operating modes, interlocks, control responses, responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. Detailed Testing Procedures: CxA, with HVAC Contractor, TAB Subcontractor, and HVAC Instrumentation and Control Contractor, shall prepare detailed testing plans, procedures, and checklists for HVAC systems, subsystems, and equipment.
- E. HVAC Instrumentation and Control System Testing:
 - 1. Field testing plans and testing requirements are specified in Division 23 Section "Instrumentation & Controls of HVAC & Plumbing Systems". The CxA, HVAC Contractor, Equipment Provider/Manufacturer and the HVAC Instrumentation and Control Contractor shall collaborate to prepare testing plans.
 - 2. CxA shall convene a meeting of appropriate entities to review test report of HVAC instrumentation and control systems.
- F. Heat-Generation System Testing: HVAC Contractor shall prepare a testing plan to verify performance of heat pumps, energy recovery ventilators, variable refrigerant volume units, unit heaters. Plan shall include the following:
 - 1. Sequence of testing and testing procedures for each item of equipment and section of pipe to be tested, identified by identification marker. Markers shall be keyed to Drawings for each pipe sector showing the physical location of each item of equipment and pipe test

- section. Drawings shall be formatted to allow each item of equipment and section of piping to be physically located and identified when referred to in the system testing plan.
2. Tracking checklist for managing and ensuring that all pipe sections have been tested.
 3. Variable refrigerant flow equipment volts, amps, temperatures, and modes of operation.
- G. Refrigeration System Testing: HVAC Contractor shall prepare a testing plan to verify performance of heat pumps, ERV units, variable refrigerant volume systems, ductless units, and other refrigeration systems. Plan shall include the following:
1. Sequence of testing and testing procedures for each item of equipment and section of pipe to be tested, identified by identification marker. Markers shall be keyed to Drawings showing the physical location of each item of equipment and pipe test section. Drawings shall be formatted to allow each item of equipment and section of piping to be physically located and identified when referred to in the system testing plan.
 2. Tracking checklist for managing and ensuring that all pipe sections have been tested.
 3. Variable refrigerant flow equipment volts, amps, temperatures, and modes of operation.
- H. HVAC Distribution System Testing: HVAC Contractor shall prepare a testing plan to verify performance of air, ERV unit supply and exhaust, and other distribution systems. Include HVAC terminal equipment and unitary equipment. Plan shall include the following:
1. Sequence of testing and testing procedures for each item of equipment and section of pipe to be tested, identified by identification marker. Markers shall be keyed to Drawings showing the physical location of each item of equipment and pipe test section. Drawings shall be formatted to allow each item of equipment and section of piping to be physically located and identified when referred to in the system testing plan.
 2. Tracking checklist for managing and ensuring that all pipe sections have been tested.
 3. ERV unit, air flow rates, air temperatures, fluid flow rates, safeties, and demand controlled ventilation.
- I. Deferred Testing:
1. If tests cannot be completed because of a deficiency outside the scope of the HVAC system, the deficiency shall be documented and reported to Owner. Deficiencies shall be resolved and corrected by appropriate parties and test rescheduled.
 2. If the testing plan indicates specific seasonal testing, appropriate initial performance tests shall be completed and documented and additional tests scheduled.
- J. Testing Reports:
1. Reports shall include measured data, data sheets, and a comprehensive summary describing the operation of systems at the time of testing.
 2. Include data sheets for each controller to verify proper operation of the control system, the system it serves, the service it provides, and its location. For each controller, provide space for recording its readout, the reading at the controller's sensor(s), plus comments. Provide space for testing personnel to sign off on each data sheet.
 3. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.

END OF SECTION

SECTION 01 91 16

ELECTRICAL SYSTEMS COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for commissioning the electrical system and its subsystems and equipment. This Section supplements the general requirements specified in Division 01 Section "General Commissioning Requirements."
- B. Related Sections include the following:
 - 1. Division 01 Section "General Commissioning Requirements" for general requirements for commissioning processes that apply to this Section.
- C. The following systems and/or equipment shall be commissioned.
 - 1. Sports lighting.
 - 2. Lighting control systems.
 - 3. Electrical distribution system.
 - 4. Communication systems.
 - 5. Fire Alarm System.
 - 6. Security System.
 - 7. Exterior lighting and associated controls.
 - 8. Electrical distribution system.
 - a. Distribution panelboards.
 - b. Safety/disconnect switches.
 - c. Motor starters.
 - d. Lighting contactors.
 - 9. Communication systems.
 - a. Data systems.
 - b. Telephone/intercom.
 - 10. Emergency Lighting.
 - 11. Local AV Systems.

1.3 DEFINITIONS

- A. Architect: Includes Architect identified in the Contract for Construction between Owner and Contractor, plus consultant/design professionals responsible for design of electrical systems, electrical, communications, and other related systems.
- B. CxA: Commissioning Authority.
- C. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.

1.4 CONTRACTOR'S RESPONSIBILITIES

- A. The following responsibilities are in addition to those specified in Division 01 Section "General Commissioning Requirements."
- B. Electrical Contractor:
 - 1. Provide certified and calibrated measuring instruments and logging devices to record test data, and data acquisition equipment to record data for the complete range of testing for the required test period.
- C. Electrical Contractor:
 - 1. With the Mechanical Contractor, coordinate installations and connections between and among electrical and HVAC systems, subsystems, and equipment.
 - 2. Attend TAB verification testing.

1.5 COMMISSIONING DOCUMENTATION

- A. The following are in addition to documentation specified in Division 01 Section "General Commissioning Requirements."
- B. Test Checklists: CxA with assistance of Contractor shall develop test checklists for electrical systems, subsystems, and equipment, including interfaces and interlocks with other systems. CxA shall prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. In addition to the requirements specified in Division 01 Section "General Commissioning Requirements," checklists shall include, but not be limited to, the following:
 - 1. Calibration of sensors and sensor function.
 - 2. Testing conditions under which test was conducted, including (as applicable) ambient conditions, set points, override conditions, and status and operating conditions that impact the results of test.
 - 3. Control sequences for electrical systems.
 - 4. Strength of control signal for each set point at specified conditions.
 - 5. Responses to control signals at specified conditions.
 - 6. Sequence of response(s) to control signals at specified conditions.
 - 7. Electrical demand or power input at specified conditions.

8. Power quality and related measurements.
9. Expected performance of systems, subsystems, and equipment at each step of test.
10. Narrative description of observed performance of systems, subsystems, and equipment. Notation to indicate whether the observed performance at each step meets the expected results.
11. Interaction of auxiliary equipment.
12. Issues log.

1.6 SUBMITTALS

- A. The following submittals are in addition to those specified in Division 01 Section "General Commissioning Requirements."
- B. Testing Procedures: CxA shall submit detailed testing plan, procedures, and checklists for each series of tests. Submittals shall include samples of data reporting sheets that will be part of the reports.
- C. Certificate of Readiness: CxA shall compile certificates of readiness from Contractor certifying that systems, subsystems, equipment, and associated controls are ready for testing.
- D. Certificate of Completion of Installation, Prestart, and Startup: CxA shall certify that installation, prestart, and startup activities have been completed.
- E. Test and Inspection Reports: CxA shall compile and submit test and inspection reports and certificates, and shall include them in systems manual and commissioning report.
- F. Corrective Action Documents: CxA shall submit corrective action documents.

1.7 ALTERNATES

- A. Refer to Division 01, *-Alternates* for description of work under this section affected by alternates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TESTING PREPARATION

- A. Prerequisites for Testing:
 1. Certify that electrical systems, subsystems, and equipment have been completed, calibrated, and started; are operating according to the Contract Documents; and that Certificates of Readiness are signed and submitted.
 2. Certify that electrical instrumentation and control systems have been completed and calibrated; are operating according to the Contract Documents; and that pretest set points have been recorded.

3. Test systems and intersystem performance after approval of test checklists for systems, subsystems, and equipment.
4. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shut down, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
5. Verify each operating cycle after it has been running for a specified period and is operating in a steady-state condition.
6. Inspect and verify the position of each device and interlock identified on checklists. Sign off each item as acceptable, or failed. Repeat this test for each operating cycle that applies to system being tested.
7. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
8. Annotate checklist or data sheet when a deficiency is observed.
9. Verify proper responses of monitoring and control system controllers and sensors to include the following:
 - a. For each controller or sensor, record the indicated monitoring and control system reading and the test instrument reading. If initial test indicates that the test reading is outside of the control range of the installed device, check calibration of the installed device and adjust as required. Retest malfunctioning devices and record results on checklist or data sheet.
 - b. Report deficiencies and prepare an issues log entry.

3.2 TESTING

- A. Test systems and intersystem performance after test checklists for systems, subsystems, and equipment have been approved.
- B. Perform tests using design conditions whenever possible.
 1. Simulate conditions by imposing an artificial load when it is not practical to test under design conditions and when written approval for simulated conditions is received from CxA. Before simulating conditions, calibrate testing instruments. Set and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.
- C. Scope of Electrical Contractor Testing:
 1. Testing scope shall include entire electrical installation, from incoming service through distribution systems to each space. It shall include measuring voltages and currents and effectiveness of operational and control functions.
 2. Test all operating modes, interlocks, control responses, responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. Detailed Testing Procedures: CxA, with Electrical Contractor shall prepare detailed testing plans, procedures, and checklists for electrical systems, subsystems, and equipment.

- E. Electrical System Testing: Electrical Contractor shall prepare a testing plan to verify performance of emergency generator, lighting control systems, electrical distribution systems, communication systems, security systems, exterior lighting control systems, electrical distribution systems, fire alarm and voice evacuation system, stage lighting/dimming system. Plan shall include the following:
1. Sequence of testing and testing procedures for each item of equipment and section of wiring to be tested, identified by identification marker. Markers shall be keyed to Drawings for each wiring sector showing the physical location of each item of equipment and electrical wiring test section. Drawings shall be formatted to allow each item of equipment and section of wiring to be physically located and identified when referred to in the system testing plan.
 2. Tracking checklist for managing and ensuring that all wiring systems have been tested.
- F. Deferred Testing:
1. If tests cannot be completed because of a deficiency outside the scope of the electrical system, the deficiency shall be documented and reported to Owner. Deficiencies shall be resolved and corrected by appropriate parties and test rescheduled.
 2. If the testing plan indicates specific seasonal testing, appropriate initial performance tests shall be completed and documented and additional tests scheduled.
- G. Testing Reports:
1. Reports shall include measured data, data sheets, and a comprehensive summary describing the operation of systems at the time of testing.
 2. Include data sheets for each electrical systems to verify proper operation of the electrical systems, the system it serves, the service it provides, and its location. Provide space for testing personnel to sign off on each data sheet.
 3. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Concrete formwork.
- C. Floors and slabs on grade.
- D. Concrete foundations.
- E. Concrete reinforcement.
- F. Joint devices associated with concrete work.
- G. Miscellaneous concrete elements, including equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.
- H. Concrete curing.

1.02 REFERENCE STANDARDS

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International; 2010.
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- C. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; American Concrete Institute International; 1998 (Reapproved 2004).
- D. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.
- E. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007).
- F. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- G. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.
- H. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.
- I. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- J. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2008.
- K. ACI 347 - Guide to Formwork for Concrete; American Concrete Institute International; 2004.
- L. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

- M. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.
- N. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.
- O. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- P. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.
- Q. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete; 2009.
- R. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2012.
- S. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).
- T. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

1.03 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 underslab vapor retarder to be used.
- D. LEED Submittal: If any fly ash, 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. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.04 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347 to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

2.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M Grade 60 (420).
- B. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type.
 - 1. Form: Flat Sheets.

2. Mesh Size and Wire Gage: As indicated on drawings.
- C. Reinforcement Accessories:
 1. Tie Wire: Annealed, minimum 16 gage.
 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal Portland type.
- B. Fine and Coarse Aggregates: ASTM C 33.
- C. Lightweight Aggregate: ASTM C 330.
- D. Fly Ash: ASTM C618, Class C or F.
- E. Water: Clean and not detrimental to concrete.

2.04 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
 1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.
 2. Products:
 - a. Insulation Solutions, Inc; Viper VaporCheck II 15-mil (Class A):
www.insulationsolutions.com.
 - b. Stego Industries, LLC; Stego Wrap Vapor Barrier 15-mil (Class A):
www.stegoindustries.com.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
- C. Moisture-Retaining Cover: ASTM C 171; regular curing paper, clear polyethylene, or white burlap-polyethylene sheet.

2.05 BONDING AND JOINTING PRODUCTS

- A. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

2.06 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
 1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.
- B. Proportioning Structural Lightweight Concrete: Comply with ACI 211.2 recommendations.
 1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.
- C. Concrete Strength: Establish required average strength for each type of concrete on the basis of 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. Normal Weight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 psi.
- E. Structural Lightweight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 psi.

PART 3 EXECUTION

3.01 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.02 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.04 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.

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
 2. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
- B. Measure F(F) and F(L) in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.

- C. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than $F(F) 13/F(L) 10$.
- D. 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.

3.06 CONCRETE FINISHING

- A. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 301.1R; thin floor coverings include carpeting, resilient flooring, and seamless flooring.
 - 2. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

3.07 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Surfaces Not in Contact with Forms:
 - 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 - 2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-fog spray, or saturated burlap.
 - 3. Final Curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Cover: Seal in place with waterproof tape or adhesive.

3.08 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. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

3.09 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.10 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Concrete Block.
 - 1. Standard concrete masonry units.
- C. Clay Facing Brick.
- D. Mortar and Grout.
- E. Reinforcement and Anchorage.
- F. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 04 72 00 - Cast Stone masonry
- B. Section 07 26 40 Spray PolyurethaneFoam Insulating Air Barrier: Insulation for cavity spaces.
- C. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

1.03 ALTERNATES

- A. Refer to Section 01 23 00 - Alternates, for description of work under this Section affected by alternates.

1.04 REFERENCE STANDARDS

- A. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a.
- D. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2011b.
- E. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.
- F. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.
- G. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- I. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2011.
- J. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2012.

- K. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
- L. ASTM C476 - Standard Specification for Grout for Masonry; 2010.
- M. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2008) .
- N. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2011a.
- O. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.

1.05 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.
- D. Shop Drawings: For the following:
 - 1. Embedded Masonry Flashing: showing location of each course in wall section and plan view of each course with all details and stop ends referenced.
- E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
- F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

1.06 MOCK-UP

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories and structural backup in mock-up.
- B. Locate where directed.

1.07 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Regional Materials: Provide CMUs that have been manufactured within 500 miles of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
 - 2. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 - 3. Special Shapes: Provide non-standard blocks configured for corners.
 - a. Provide bullnose blocks at exposed corners.
 - 4. Load-Bearing Units: ASTM C90, normal weight.
 - 5. Units with Integral Water Repellent: Concrete block units as specified in this section with polymeric liquid or powder admixture added to concrete masonry units at the time of manufacture.
 - a. Performance of Units with Integral Water Repellent:

- 1) Water Permeance: When tested per ASTM E514 and for a minimum of 72 hours.
 - (a) No water visible on back of wall above flashing at the end of 24 hours.
 - (b) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
 - (c) No more than 25% of wall area above flashing visibly damp at end of test.
- 2) Flexural Bond Strength: ASTM C1357; minimum 10% increase.
- 3) Compressive Strength: ASTM C1314; maximum 5% decrease.
- 4) Drying Shrinkage: ASTM C1148; maximum 5% increase in shrinkage.
- b. Use only in combination with mortar and grout that also has integral water repellent admixture.

2.02 BRICK UNITS

- A. Facing Brick: ASTM C216, Type FBS, Grade SW.
 1. Regional Materials: Provide brick that has been manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
 2. Actual size: Standard Modular, 2-1/4 by 7-5/8 by 3-5/8.
 3. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 4. Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - a. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - b. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - c. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 - d. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
 - e. Provide lipped brick at lintels and relieving angles.
 - f. Provide soldier course corner bricks.
- B. Face Brick: Facing brick complying with ASTM C 216.
 1. Face Brick A:
 - a. Texture: Smooth.
 - b. A blend of minimum (4) different reds of a narrow range.
 - c. Basis-of-Design Product: Subject to compliance with requirements, provide Colony Red Range as manufactured by Belden.
 2. Face Brick B:
 - a. Texture: Knife cut.
 - b. Color: Dark Red/Brown.
 - c. Basis-of-Design Product: Subject to compliance with requirements, provide Kingsport Knifecut as manufactured by Belden.

2.03 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91, Not Permitted.
- B. Portland Cement: ASTM C150, Type I; color as required to produce approved color sample.

- C. Hydrated Lime: ASTM C207, Type S.
- D. Mortar Aggregate: ASTM C144.
- E. Grout Aggregate: ASTM C404.
- F. Water: Clean and potable.
- G. Integral Water Repellent Admixture for Mortar and Grout: Polymeric liquid or powder admixture added to mortar and grout at the time of manufacture.
 - 1. Performance of Mortar and Grout with Integral Water Repellent:
 - a. Water Permeance: When tested per ASTM E514 for a minimum of 72 hours.
 - 1) No water visible on back of wall above flashing at the end of 24 hours.
 - 2) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
 - 3) No more than 25% of wall area above flashing visibly damp at end of test.
 - b. Flexural Bond Strength: ASTM C1357; minimum 10% increase.
 - c. Compressive Strength: ASTM C1314; maximum 5% decrease.
 - d. Drying Shrinkage: ASTM C1148; maximum 5% increase in shrinkage.
 - 2. Use only in combination with masonry units produced with integral water repellent admixture.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Single Wythe Joint Reinforcement: Truss 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.
- B. Adjustable Multiple Wythe Joint Reinforcement: Ladder type with adjustable ties or tabs 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.
- C. 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.

2.05 FLASHINGS

- A. Flashing Type 1: Manufacturer's standard Elvaloy-modified flashing of type indicated below:
 - 1. Hyload SA Cloaked Flashing System:
 - a. 40 mils minimum thickness, glass reinforced.
 - b. UV resistant.
 - c. Color: black.
 - d. Provide all mastic and primer as recommended by manufacturer.
- B. Drip Edge: Install Flashing with a minimum 3 inch, extruded drip extending 3/8 inch beyond the face of building, unless otherwise directed by Architect.
 - 1. Stainless Steel Drip Edge manufactured by Hohmann & Barnard, Inc.
- C. Cloaks: Provide manufacturer's extruded pre-formed shapes for integration with embedded flashing at all inside corners, outside corners and at all change in elevations in embedded flashing system.

- D. Stop Ends: Locate "Stop Ends" at all windowsills, headers and inside corner terminations.
- E. Shelf Angles & Lintels: Flashing must be carried through the wall to prevent water from bypassing flashing.
- F. Shelf Angle Soft Joints: Flashing Membrane or Drip must be compatible with wet sealant. Provide letter from flashing manufacturer addressing sealant compatibility.

2.06 ACCESSORIES

- A. Preformed Control Joints: Neoprene material. Provide with corner and tee accessories, fused joints.
- B. Joint Filler: Closed cell neoprene; oversized 50 percent to joint width; self expanding; 3.5 inch wide x by maximum lengths available.
 - 1. Manufacturers:
 - a. Williams Products, Inc.; Product Type NN1, 1040 Series.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, 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) Advanced Building Products Inc: www.advancedflashing.com.
 - 2) Mortar Net USA, Ltd: www.mortarnet.com.
 - 3) Substitutions: See Section 01 60 00 - Product Requirements.
- D. Weeps: Open Head Joints.
- E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 MORTAR AND GROUT MIXES

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
 - 1. Masonry below grade and in contact with earth: Type M.
 - 2. Exterior, loadbearing masonry: Type S.
 - 3. Exterior, non-loadbearing masonry: Type N.
- 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.
- D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

- A. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- B. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave, except at masonry to receive spray foam provide flush joints fully filled with mortar and mortar droppings removed from ties.
- C. Brick Units:
 - 1. Bond: Running.
 - 2. Coursing: Three units and three mortar joints to equal 8 inches.
 - 3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

- A. Lay hollow masonry units with face shell bedding on head and bed joints.
- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- C. Remove excess mortar and mortar smears as work progresses.
- D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where resilient base is scheduled or cavity insulation vapor barrier adhesive is applied.

3.06 WEEPS/CAVITY VENTS

- A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

3.07 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 as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. 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.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Masonry Back-Up: Embed anchors to bond veneer at maximum 24 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.

3.10 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.
- B. Extend through-wall flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.
- C. Lap end joints of flashings at least 4 inches and seal with compatible sealant or self-sealing flashing.

3.11 GROUTED COMPONENTS

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

3.12 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.

3.13 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 frames in adjacent mortar joints. Fill frame voids solid with grout.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

3.14 CUTTING AND FITTING

- A. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.15 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.

3.16 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

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Architectural cast stone.
- C. Units required are:
 - 1. Exterior wall units, including wall caps, coping, and sills.
 - 2. Other items indicated on the drawings.

1.02 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.

1.03 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.
- I. ASTM C1364 - Standard Specification for Architectural Cast Stone; 2010b.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Manufacturer's Qualification Data: Documentation showing compliance with specified requirements.
- C. Product Data: Test results of cast stone components made previously by the manufacturer.

- 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.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A current producer member of the Cast Stone Institute with a minimum of 5 years of experience in producing cast stone of the types required for project and:
 - 1. Adequate plant capacity to furnish quality, sizes, and quantity of cast stone required without delaying progress of the work.
 - 2. Products previously produced by plant and exposed to weather that exhibit satisfactory appearance.
- B. Mock-Up: Provide full size cast stone components for installation in mock-up of exterior wall.
 - 1. Approved mock-up will become standard for appearance and workmanship.
 - 2. Mock-up may remain as part of the completed work.
- 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.

1.06 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

2.01 MANUFACTURERS

- A. Architectural Cast Stone:
 - 1. Continental Cast Stone Manufacturing, Inc.,
 - 2. RockCast, A Division of Reading Rock, Inc..

2.02 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 laboratory testing in accordance with ASTM C1364.
 - 3. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet.
 - 4. Color: Match sample on file at Architect 's office.
 - 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. Pieces More than 12 inches Wide: Provide full length two-way reinforcement of cross-sectional area not less than 0.25 percent of unit cross-sectional area.

2.03 MATERIALS

- A. Portland Cement: ASTM C150.
 - 1. For Units: Type I, white or gray as required to match Architect 's sample.
 - 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. Admixtures: ASTM C494/C494M.
- E. Water: Potable.
- F. Reinforcing Bars: ASTM A615/A615M deformed bars, galvanized or epoxy coated.
- G. Steel Welded Wire Reinforcement: ASTM A185/A185M, galvanized or epoxy coated.
- H. Embedded Anchors, Dowels, and Inserts: Type 304 stainless steel, of type and size as required for conditions.
- I. Mortar: Portland cement-lime, ASTM C270, Type N; do not use masonry cement.
- J. 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.

PART 3 EXECUTION

3.01 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.
- 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 courses, including copings, parapets, cornices, sills, and steps.
 - b. Joints in projecting units.
 - c. Joints between rigidly anchored units, including soffits, panels, and column covers.
 - d. Joints below lugged sills and stair treads.
 - e. Joints below ledge and relieving angles.
 - f. Joints labeled "expansion joint".
- E. Repairs: Repair chips and other surface damage noticeable when viewed in direct daylight at 20 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.

3.02 CLEANING

- A. Clean completed exposed cast stone after mortar is thoroughly set and cured.
 - 1. Wet surfaces with water before applying cleaner.
 - 2. Apply cleaner to cast stone in accordance with manufacturer's instructions.
 - 3. Remove cleaner promptly by rinsing thoroughly with clear water.
 - 4. Do not use acidic cleaners.

3.03 PROTECTION

- A. Protect completed work from damage.
- B. Clean, repair, or restore damaged or mortar-splashed work to condition of new work.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Structural steel framing members, support members.
- C. Base plates, shear stud connectors and expansion joint plates.
- D. Grouting under base plates.

1.02 RELATED REQUIREMENTS

- A. Section 05 21 00 - Steel Joist Framing.
- B. Section 05 31 00 - Steel Decking: Support framing for small openings in deck.

1.03 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; American Institute of Steel Construction, Inc.; 2005.
- B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2005.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- E. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2007.
- F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- G. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2010.
- H. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- I. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2009.
- J. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2007.
- K. ASTM A514/A514M - Standard Specification for High-Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding; 2005 (Reapproved 2009).
- L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011.
- M. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2011.

- N. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners; 2009.
- O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2007.
- P. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.

1.04 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, attachments, and fasteners.
 - 2. Connections not detailed.
 - 3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.05 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC "Steel Construction Manual."

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Rolled Steel Structural Shapes: ASTM A992/A992M.
- C. Hot-Formed Structural Tubing: ASTM A501, seamless or welded.
- D. Steel Bars: ASTM A108.
- E. Steel Plate: ASTM A514/A514M.
- F. Pipe: ASTM A53/A53M, Grade B, Finish black.
- G. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.
- H. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A galvanized to ASTM A 153/A 153M, Class C.
- I. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, medium carbon, galvanized.
- J. Load Indicator Washers: Provide washers complying with ASTM F959 at all connections requiring high-strength bolts.
- K. Welding Materials: AWS D1.1; type required for materials being welded.
- L. 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.
- M. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

- N. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.

PART 3 EXECUTION

3.01 ERECTION

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.02 TOLERANCES

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

END OF SECTION

SECTION 05 21 00

STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.
- C. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
- D. Supplementary framing for roof openings greater than 18 inches.

1.02 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Steel Framing: Grouting base plates and bearing plates. Superstructure framing.
- B. Section 05 31 00 - Steel Decking: Bearing plates and angles.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2010.
- D. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- E. SJI (SPEC) - Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders; Steel Joist Institute; 2005.
- F. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; Steel Joist Institute; 2008.
- G. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).
- H. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.
- C. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.
- D. Manufacturer's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

- A. Perform Work, including that for headers and other supplementary framing, in accordance with SJI Standard Specifications Load Tables and SJI Technical Digest No.9.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Open Web Joists: SJI Type K Joists:
 - 1. Provide bottom chord extensions as indicated.
 - 2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.
 - 3. Minimum End Bearing on Concrete or Masonry Supports: Comply with referenced SJI standard.
 - 4. Finish: Shop primed.
- B. Open Web Joists: SJI Type LH Joists:
- C. Anchor Bolts, Nuts and Washers: ASTM A 307, hot-dip galvanized per ASTM A 153/A 153M, Class C.
- D. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36/A 36M.
- E. Welding Materials: AWS D1.1; type required for materials being welded.
- F. Shop and Touch-Up Primer: SSPC-Paint 25, zinc oxide, complying with VOC limitations of authorities having jurisdiction.

2.02 FINISH

- A. Shop prime joists as specified.
- B. Prepare surfaces to be finished in accordance with SSPC-SP 2.

PART 3 EXECUTION

3.01 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. Install supplementary framing for floor and roof openings greater than 18 inches.
- F. 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.
- G. Do not field cut or alter structural members without approval of joist manufacturer.

3.02 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.

- B. Maximum Offset From True Alignment: 1/4 inch.

3.03 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

END OF SECTION

SECTION 05 31 00

STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Roof deck.
- C. Supplementary framing for openings up to and including 18 inches.
- D. Bearing plates and angles.

1.02 RELATED REQUIREMENTS

- A. Section 05 21 00 - Steel Joist Framing: Support framing for openings larger than 18 inches and shear stud connectors.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- 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. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- E. AWS D1.3 - Structural Welding Code - Sheet Steel; American Welding Society; 2008.
- F. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc.; 2011.
- G. ICC-ES AC70 - Acceptance Criteria for Fasteners Power Driven into Concrete, Steel and Masonry Elements; ICC Evaluation Service, Inc.; 2012.
- 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).

1.04 QUALITY ASSURANCE

- A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Delaware.
- B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172).

1.05 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

2.01 STEEL DECK

- A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
- B. Roof Deck: Non-composite type, fluted steel sheet:
 - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.

2.02 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.
- B. Welding Materials: AWS D1.1.
- C. Fasteners: Galvanized hardened steel, self tapping.
- D. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.
- E. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- G. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.

2.03 FABRICATED DECK ACCESSORIES

- A. Sheet Metal Deck Accessories: Metal closure strips and cover plates, 22 gage thick sheet steel; of profile and size as indicated; finished same as deck.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 1-1/2 inch bearing.
- D. At mechanically fastened male/female side laps fasten at 24 inches on center maximum.
- E. Weld deck in accordance with AWS D1.3.
- F. At deck openings from 6 inches to 18 inches in size, provide 2 x 2 x 1/4 inch steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
- G. Where deck changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches on center maximum.
- H. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- I. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.

- J. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Formed steel stud exterior wall framing.
- C. Exterior wall sheathing.

1.02 RELATED REQUIREMENTS

- A. Section 07 21 29 Sprayed Insulation: Spray insulation applied over wall sheathing.

1.03 REFERENCE STANDARDS

- A. 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)
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- 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. 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.
- E. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- G. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.04 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. 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. Provide design engineer's stamp on shop drawings.
- D. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 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.

2.02 FRAMING MATERIALS

- A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
 - 1. Gage and depth: As indicated on the drawings.
 - 2. Galvanized in accordance with ASTM A653/A653M G90/Z275 coating.
- B. Framing Connectors: Factory-made formed steel sheet, ASTM A653/A653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.
 - 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, screws and anti-friction bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
 - a. 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.
 - 3. 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.

2.03 WALL SHEATHING

- A. Wall Sheathing: Glass mat faced gypsum; ASTM C1177/C1177M, square long edges, 5/8 inch Type X fire-resistant.

2.04 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.

2.05 FASTENERS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
- B. Anchorage Devices: Drilled expansion bolts.

- C. Welding: In conformance with AWS D1.1.

PART 3 EXECUTION

3.01 INSTALLATION OF STUDS

- A. Install components in accordance with manufacturers' instructions and ASTM C1007 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. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using fastener method.
- D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- E. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- F. Install intermediate studs above and below openings to align with wall stud spacing.
- G. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- H. Attach cross studs to studs for attachment of fixtures anchored to walls.
- I. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- J. Touch-up field welds and damaged galvanized surfaces with primer.

3.02 WALL SHEATHING

- A. Wall Sheathing: Secure with long dimension parallel to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Shop fabricated steel items.

1.02 RELATED REQUIREMENTS

- A. Section 09 90 00 - Painting and Coating: Paint finish.

1.03 REFERENCE STANDARDS

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- E. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2009.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2007.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010.
- H. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- I. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.04 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. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- B. Slotted Channel Framing: ASTM A653, Grade 33.
- C. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M where connecting galvanized components.
- D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. 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.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
 - 1. Side Rails: 3/8 x 2 inches members spaced at 20 inches.
 - 2. Rungs: one inch diameter solid square bar spaced 12 inches on center.
 - 3. Space rungs 7 inches from wall surface.
 - 4. Provide brackets at top and bottom, welded to rails and bolted to building structure.
- B. Bollards: 6 inch steel pipe, 3,000 psi concrete filled, crowned cap, as detailed; prime paint finish.
- C. Steel Angle Vanity Support: ASTM A 36/A 36M steel angles, welded to support vanities with anchoring devices and sizes as indicated in shop drawings.

2.04 MANUFACTURED PRODUCTS

- A. Access panel: Provide Milcor or equal prime coated steel access panel with screw cam operated locks.

2.05 FINISHES - STEEL

- A. Prime paint all steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete or masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Prime Painting: One coat.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Perform field welding in accordance with AWS D1.1/D1.1M.
- D. Obtain approval prior to site cutting or making adjustments not scheduled.
- E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Roofing nailers.
- C. Fire retardant treated wood materials.
- D. Concealed wood blocking, nailers, and supports.

1.02 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.
- D. AWWA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2010.
- E. PS 1 - Structural Plywood; 2007.
- F. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.

1.03 SUBMITTALS

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

1.04 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

2.01 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. Provide sustainably harvested wood; see Section 01 60 00 for requirements.
- D. Provide wood harvested within a 500 mile radius of the project site; see Section 01 60 00 for requirements for locally-sourced products.

2.02 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.

2.03 CONSTRUCTION PANELS

- A. Wall Sheathing: Glass mat faced gypsum, ASTM C1177/C1177M, square long edges, 5/8 inch Type X fire-resistant. See Section 05 40 00.
- B. Other Applications:
 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
 2. Other Locations: PS 1, C-D Plugged or better.

2.04 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.

2.05 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWWA 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.
- B. Fire Retardant Treatment:
 1. Interior Type A: AWWA 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.

PART 3 EXECUTION

3.01 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.

3.02 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.03 INSTALLATION OF CONSTRUCTION PANELS

- A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

3.04 CLEANING

- A. Waste Disposal: Comply with the requirements of Section 01 74 19.
 - 1. Comply with applicable regulations.
 - 2. Do not burn scrap on project site.
 - 3. Do not burn scraps that have been pressure treated.
 - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 20 00

FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Finish carpentry items.
- C. Hardware and attachment accessories.

1.02 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. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.03 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.
 - 2. Provide instructions for attachment hardware and finish hardware.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.
- D. Samples: Submit two samples of wood trim 12 inch long.
- 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.

1.04 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 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. Interior Woodwork Items:

2.02 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.
- B. Provide wood harvested within a 500 mile radius of the project site.

2.03 FASTENINGS

- A. Fasteners: Of size and type to suit application; zinc plated finish in concealed locations and stainless steel finish in exposed locations.
- B. Concealed Joint Fasteners: Threaded steel.

2.04 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.

2.05 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Shop prepare and identify components for book match grain matching during site erection.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 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.
- D. Install hardware in accordance with manufacturer's instructions.

3.02 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 07 21 00

THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Board insulation at perimeter foundation wall.
- C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

- A. Section 07 26 40: Spray Polyurethane Foam Insulating Air Barrier: Insulation Type 2.
- B. Section 07 53 00 - Elastomeric Membrane Roofing: Insulation specified as part of roofing system.

1.03 REFERENCE STANDARDS

- A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2011be1.
- B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2012.

1.04 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.

PART 2 PRODUCTS

2.01 APPLICATIONS

- A. Insulation at Perimeter of Foundation: Extruded polystyrene board.

2.02 FOAM BOARD INSULATION MATERIALS

- A. Insulation Type 1: Extruded Polystyrene Board Insulation: ASTM C578, Type X; Extruded polystyrene board with natural skin surfaces; with the following characteristics:
 - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 2. Perimeter foundation wall insulation.
 - 3. Board Size: 24 x 96 inch.
 - 4. Board Thickness: 2 inches.
 - 5. Board Edges: Square.
 - 6. Compressive Resistance: 25 psi.
 - 7. Manufacturers:
 - a. Dow Chemical Co: www.dow.com.
 - b. Owens Corning Corp: www.owenscorning.com.

- 8. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulation Type 2: See Section 07 26 40: Spray Polyurethane Foam.

2.03 BATT INSULATION MATERIALS

- A. Insulation Type 3 and 4: Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
 - 1. Insulation at cold formed metal framing, eaves and soffits.
 - 2. Thickness: 6 inch.
 - 3. Facing: Type 3 - Unfaced; Type 4 - Aluminum foil, flame spread <25, one side.
 - 4. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com.
 - b. Johns Manville Corporation: www.jm.com.
 - c. Owens Corning Corp: www.owenscorning.com.
- B. Insulation Type 5: Acoustical (Not Used)
- C. Insulation Type 6: Flexible mineral fiber preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
 - 1. Fire safing insulation.
 - 2. Manufacturers:
 - a. Thermafiber, Inc: www.thermafiber.com.

2.04 ACCESSORIES

- A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
- B. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, or irregularities.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Install boards horizontally on foundation perimeter.
 - 1. Install in running bond pattern.
 - 2. Butt edges and ends tightly to adjacent boards and to protrusions.
- B. Extend boards over expansion joints, unbonded to foundation on one side of joint.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 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 insulation batts in place.
- G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- H. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.
- I. Tape seal tears or cuts in vapor retarder.
- J. 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.

3.04 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 26 40

SPRAY POLYURETHANE FOAM INSULATING AIR BARRIER

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. This section includes the following:
 - 1. Materials and installation to bridge and seal the following air leakage pathways and gaps:
 - a. Connections of the walls to the roof air barrier.
 - b. Connections of the walls to the foundations.
 - c. Seismic and expansion joints.
 - d. Openings and penetrations of window frames, store front, curtain wall.
 - e. Barrier envelope systems.
 - f. Door frames.
 - g. Piping, conduit, duct and similar penetrations
 - h. Masonry ties, screws, bolts and similar penetrations.
 - i. All other air leakage pathways in the building envelope.
 - j. Materials to act as flashings and counterflashings.

1.02 PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION

- A. Sheet metal flashings to be built into masonry are furnished under Section 07 62 00.

1.03 RELATED SECTIONS

- A. Section 04 20 00 - Unit Masonry:
 - 1. Masonry backup walls
 - 2. Masonry veneer cavity walls.
- B. Section 07 21 00 - Building Insulation: Insulation with integral vapor retarder facing.
- C. Section 07 90 00 - Joint Sealers: Joint sealant materials and installation.
- D. Section 08 11 13: Door frames.
- E. Section 08 43 13 Aluminum storefronts and entrances

1.04 PERFORMANCE REQUIREMENTS

- A. Provide air/vapor barrier system constructed to perform as a continuous air/vapor barrier system, as building thermal insulation, and as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration. System shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air seal materials at such locations, changes in substrate and perimeter conditions.
- B. Maximum Permissible Air Leakage Rates cfm/sf @ 0.3" w.g. (l/s.m² @ 75 Pa)
 - 1. 0.02 (0.1)

1.05 SUBMITTALS

- A. Provide submittals in accordance with Section 01 30 00.

1. Submit shop drawings showing locations and extent of air/vapor barrier and details of all typical conditions, intersections with other envelope systems and materials, membrane flashings and counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated and how miscellaneous penetrations such as conduits, pipes electric boxes and the like are sealed.
2. Submit manufacturer's product data sheets for each type of material, including manufacturer's printed instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.
3. Submit manufacturer's installation instructions.
4. Provide evidence of testing by an accredited laboratory confirming material has been tested and conforms to the requirements of ASTM E2178, Standard for Air Barrier Materials.
5. Certification by air/vapor barrier manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
6. Certification of compatibility by air/vapor barrier manufacturer, listing all materials on the project that it connects to or that come in contact with it.
7. Submit two samples, 12 by 12 inch (300 by 300 mm) minimum size, of each air/vapor barrier material required for Project.
8. Submit test results of air permeability testing of primary air barrier material (ASTM E 2178-01).
9. For LEED requirements, provide evidence of a minimum 14.6% recycled content and minimum 2.8% rapidly-renewable content.
10. Provide evidence of testing by an accredited laboratory confirming material has been tested and conforms to the requirements of ASTM E2357, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies: Pass.
11. Provide evidence of testing by an accredited laboratory confirming material has been tested and conforms to the requirements of NFPA 285: Pass.
12. Quality Assurance Program: Submit evidence of current accreditation and certification under the Air Barrier Association of America's (ABAA) Quality Assurance Program. Submit accreditation number of manufacturer and certification number of installers at time of submittal.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications:
1. Each worker who is installing air barriers must be either a Certified Applicator or an installer who is registered with ABAA
 2. Each Lead Certified Applicator can supervise a maximum of five registered installers. The Certified Applicator shall be thoroughly trained and experienced in the installation of air barriers of the types being applied. Lead Certified Applicators shall perform or directly supervise all air/vapor barrier work on the project.
 3. Installers shall also be certified by ABAA/NECA (National Energy Conservation Association) and PSDI (Professional Skills Development Institute for energy conservation) and SPFA (Spray Polyurethane Foam Alliance as foam mechanics). Installers shall have their photo-identification certification cards in their possession and available on the project site, for inspection upon request.
 4. Provide products that comply with all state and local regulations controlling use of volatile organic compounds (VOCs).
 5. Preconstruction Meeting: Convene one week prior to commencing Work of this section, in accordance with Section 01 20 00 - Project Meetings.

6. Cooperate and coordinate with the Owner's inspection and testing agency if required. Do not cover any installed air and vapor barrier unless it has been inspected, tested and approved per requirements.
7. Protect people and materials from over-spray and contact with chemicals and gases.

1.07 FIELD QUALITY ASSURANCE

- A. Implement the ABAA Quality Assurance Program requirements. Cooperate with ABAA inspectors and independent testing and inspection agencies engaged by the Owner. Do not cover air barrier until it has been inspected, tested, and accepted.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product, date of manufacture, expiration date, and directions for storage.
- B. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air/vapor barrier manufacturer. Protect stored materials from direct sunlight.
- C. Avoid spillage. Immediately notify Owner, Architect if spillage occurs and start clean up procedures.
- D. Clean spills and leave area as it was prior to spill.

1.09 WASTE MANAGEMENT AND DISPOSAL

- A. Separate and recycle waste materials in accordance with Section 01 35 50 - Waste Management and Disposal, and with the Waste Reduction Workplan.
- B. Place materials defined as hazardous or toxic waste in designated containers.
- C. Ensure emptied containers are sealed and stored safely for disposal away from children.

1.10 PROJECT CONDITIONS

- A. Environmental Conditions: Apply air/vapor barrier within range of ambient and substrate temperatures recommended by air/vapor barrier manufacturer. Do not apply air/vapor barrier to a damp or wet substrate, unless the manufacturer specifically permits that for the product.
 1. Do not apply air/vapor barrier in snow, rain, fog, or mist.
 2. Do not apply air/vapor barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the manufacturer.
 3. The product shall not be installed after the expiry date printed on the label of each container. The product has a shelf life of 6 months from the date of manufacture.

1.11 WARRANTY

- A. System Warranty: Provide the manufacturer's three year system warranty, including the primary air/vapor barrier and installed accessory sealant and membrane materials which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 - PRODUCTS

2.01 MATERIALS & MANUFACTURERS

- A. Sprayed polyurethane foam material, when tested, shall meet the requirements of ULC S705.1-01 Standard for Thermal Insulation-Spray Applied Rigid Polyurethane Foam, Medium Density, Material- Specification.
- B. A copy of an Evaluation Report (such as the CCMC Evaluation Report) or copies of the test reports from an accredited testing laboratory, for each physical property, indicating that the product meets the requirements of ULC S705.1-01 shall be made available upon request.
- C. Material containers shall be labeled with the Evaluation Report number of the evaluation agency.
- D. Design R-value as indicated in test report; minimum R6.9/inch.
- E. Density as indicated in test report: minimum 1.7 pounds per cubic foot.
- F. Smoke development as indicated in test report; less than 500 when tested under ULC S102.
- G. Products that meet the preceding requirements:
 - 1. Basis-of-design product: Walltite closed cell spray foam polyurethane air/vapor barrier as manufactured by BASF (215-966-1168).
 - 2. Or equal.

2.02 AUXILIARY MATERIALS

- A. Furnish auxiliary materials recommended by air/vapor barrier manufacturer for intended use and compatible with the air/vapor barrier.
- B. Transition Membrane: Self-adhering, smooth surfaced SBS modified bitumen membrane, nominal 40 mil thickness, width as required, to detail all rough openings, changes in material substrates, and penetrations.
 - 1. Blueskin SA as manufactured by Henry Company Inc
 - 2. Butyl-based peel and stick membrane: Transition between air/vapor barrier membrane and TPO or EPDM membranes:
 - a. Blueskin SA as manufactured by Henry Company Inc.
 - 3. Primer: Water based liquid primer for concrete, masonry, gypsum sheathing, wood, metal, and painted substrates;
 - a. Aquatac as manufactured by Henry Company Inc.
 - 4. Mastic, Adhesives, and Tape: Liquid mastic and adhesives, and adhesive tapes approved by foamed in place air/vapor barrier manufacturer.
 - 5. Stainless-Steel Sheet Flashing: ASTM A167, Type 304, soft annealed, with No. 2D finish; minimum, 0.0156 inch (0.4 mm) thick.
 - 6. Transition Strip Primer:
 - a. Blueskin Primer as manufactured by Henry Company Inc.
 - 7. Sheet Membrane Transition Strip Termination Sealant:
 - a. BES 925 Sealant by Henry Company Inc.
 - 8. Sheet Membrane Sheet Membrane Air Barrier Perimeter Seal to Windows, Doors, Curtainwall and Storefront systems: Low modulus silicone sheet; provide manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit widths indicated, combined with a neutral-curing low modulus silicone sealant for bonding extrusions to substrates.
 - a. Pecora Sil-Span.

- b. Dow 1-2-3 or equal.
- 9. Provide sealants in accordance with Section 07 90 00 - Joint Sealers. Comply with ASTM C920 and ASTM C920 classifications for type, grade, class, and uses.
 - a. Silicone Sealant Type A: natural cure, low modulus, to seal sheet membrane flashing to polyethylene face of sheet rubberized-asphalt barrier and to seal between and to non-bituminous sheet systems.
 - 1) Acceptable materials:
 - (a) Dow 790
 - (b) Pecora 864
 - 2) SPF (Sprayed Polyurethane Foam) Sealant: Provide one- or two-component, foamed-in-place, polyurethane foam sealant with the following characteristics:
 - (a) Density: 1.5 to 2.0 PCF.
 - (b) Flame Spread (ASTM E162): 25 or less.
 - (c) Initial R-Value (at 1 inch): Not less than 7.
 - (d) Acceptable materials:
 - (1) Zerodraft Foam Sealant.
 - (2) Zerodraft Insulating Air Sealant
Zerodraft (Division of Canam Building Envelope Specialists Inc.), 125 Traders Blvd. E., Unit # 4, Mississauga, ON, L4Z 2H3 Tel. 1-877-272-2626
 - b. Substrate Cleaner: Non-corrosive compatible with adjacent materials.

2.03 EQUIPMENT

- A. The equipment used to spray the polyurethane foam material shall be in accordance with ULC S705.2-02 and the equipment manufacturer's recommendations for specific type of application.
- B. Equipment settings are to be recorded on the Daily Work Record as required by the ULC S705.2-02 Installation standard.
- C. Each proportioner unit to supply only one spray gun.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions under which air/vapor barrier systems will be applied, with Installer present, for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.
 - 1. Ensure that:
 - a. surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants
 - b. concrete surfaces are cured and dry, smooth without large voids, spalled areas or sharp protrusions.
 - c. masonry joints are flush and completely filled with mortar, and all excess mortar sitting on masonry ties has been removed.
 - d. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
 - e. Notify Architect in writing of anticipated problems using air/vapor barrier over substrate.

3.02 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions.

- Provide clean, dust-free, and dry substrate for air/vapor barrier application.
- B. Prime ICBP metal substrates with conditioning primer when installing modified asphalt membrane transition membranes.
 - C. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through air/vapor barrier and at protrusions according to air/vapor barrier manufacturer's written instructions.
 - 1. Verify that surfaces and conditions are suitable to accept work as outlined in this section.
 - 2. Commencement of work outlined in this section shall be deemed as acceptance of existing work and conditions.
 - 3. Examine joints before sealing to ensure configurations, surfaces and widths are suitable for spray polyurethane foam. Report in writing all defects stating the locations of joints deemed unacceptable for the application of the spray polyurethane foam.

3.03 PREPARATION

- A. Protection:
 - 1. Mask and cover adjacent areas to protect from over spray.
 - 2. Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.
 - 3. Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.
 - 4. Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spray area.
 - 5. Surface Preparation
 - a. Surfaces to receive foam insulation shall be clean, dry and properly fastened to ensure adhesion of the polyurethane foam to the substrate.
 - b. Ensure that all work by other trades that may penetrate through the air barrier system is in place and complete.
 - c. Ensure that surface preparation and any primers required conform to the manufacturer's instructions.
 - d. Prepare surfaces by brushing, scrubbing, scraping, or grinding to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion and integrity of the spray polyurethane foam. Wipe down metal surfaces to remove release agents or other non-compatible coatings, using clean sponges or rags soaked in a solvent compatible with the spray polyurethane foam. Ensure surfaces are dry before proceeding.
 - e. Install transition membranes around and into all rough openings, to all materials penetrating the exterior wall to all applicable surfaces and ensure proper adhesion of the transition membranes to the substrate, capable of having spray polyurethane foam insulation.
 - f. Install counter-flashings"
 - 1) Metal: Mechanically fasten metal counter-flashings with screws at 8" (200 mm) o.c.
 - 2) Membrane: Cut into and uncover only 3" of siliconized release paper along one edge of the counter-flashing membrane. Adhere membrane flashing to the pre-primed substrate a minimum of 3" and roll firmly in place.
 - g. Ensure veneer anchors are in place.

3.04 APPLICATION

- A. Spray-application of polyurethane foam shall be installed in accordance with ULC S705.2-02 and the manufacturer's instructions.
- B. Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer and the ULC S705.2 Installation standard.
- C. Apply in consecutive passes as recommended by manufacturer to thickness as indicated on drawings. Passes shall be not less than ½ inch and not greater than 2 inches.
- D. Do not install spray polyurethane foam within 3 inches of heat emitting devices such as light fixtures and chimneys.
- E. Finished surface of foam insulation to be free of voids and embedded foreign objects.
- F. Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage work performed by other sections.
- G. Trim, as required, any excess thickness that would interfere with the application of cladding/covering system by other trades.
- H. Clean and restore surfaces soiled or damaged by work of the section. Consult with section of work soiled before cleaning to ensure methods used will not damage the work.
- I. Do not permit adjacent work to be damaged by work of this section. Damage to work of this section caused by other sections shall be repaired by this section at the expense of the subcontractor causing the damage.
- J. Complete connections to other components or repair any gaps, holes or other damage using material which conforms to ULC S710.1 Polyurethane Sealant Foam - One Component - Material or ULC S711.1 Polyurethane Sealant Foam - Two Components - Material and shall be installed in accordance with ULC S710.2 Polyurethane Sealant Foam - One component - Installation or ULC S711.2 Polyurethane Sealant Foam - Two Component - Installation, whichever is appropriate.

3.05 TOLERANCES

- A. Maximum variation from indicated thickness: minus (-) ¼ inch; plus (+) ½ inch.

3.06 PROTECTION

- A. Cover the spray polyurethane foam with a thermal barrier when installed on the interior of the building.

END OF SECTION

SECTION 07 26 16

UNDER-SLAB VAPOR BARRIER/RETARDER

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Vapor Barrier, seam tape, mastic, pipe boots, detail strip for installation under concrete slabs.

1.02 RELATED SECTIONS

- A. Section 03300 Cast-in-place Structural Concrete

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM E 1745-97(2004) Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs
 - 2. ASTM E 154-99(2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs
 - 3. ASTM E 96-05 Standard Test Methods for Water Vapor Transmission of Materials
 - 4. ASTM E 1643-98(2005) Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

1.04 SUBMITTALS

- A. Quality Control / Assurance
 - 1. Independent laboratory test results showing compliance with ASTM & ACI Standards.
 - 2. Manufacturer's samples, literature
 - 3. Manufacturer's installation instructions for placement, seaming and pipe boot installation

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Vapor Barrier
 - 1. Vapor Barrier must have the following qualities
 - a. Perm rating less than or equal to 0.01 perms (grains/(ft² *hr * in. Hg)) after conditioning as tested by:
 - 1) ASTM E 96
- B. Vapor Barrier Products
 - 1. Stego Wrap (15 mil) Vapor Barrier by STEGO INDUSTRIES LLC, San Clemente, CA (877) 464-7834 www.stegoindustries.com
 - 2. Griffolyn 15 mil Green Vapor Barrier by Reef Industries, Inc.
 - 3. VaporBlock 15 by Raven Industries, Inc.
- C. ACCESSORIES
 - 1. Seam Tape
 - a. Tape must have the following qualities:
 - 1) Water Vapor Transmission Rate ASTM E 96: 0.3 perms or lower

2. Vapor Proofing Mastic
 - a. Mastic must have the following qualities:
 - 1) Water Vapor Transmission Rate ASTM E 96: 0.3 perms or lower
3. Pipe Boots
 - a. Provide manufacturer's supplied pipe boot system or construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer's instructions.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Ensure that subsoil is approved by architect or geotechnical firm
 1. Level and tamp or roll aggregate, sand or tamped earth base.

3.02 INSTALLATION

- A. Install Vapor Barrier/Retarder:
 1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643.
 - a. Unroll Vapor Barrier/Retarder with the longest dimension parallel with the direction of the pour.
 - b. Lap Vapor Barrier/Retarder over footings and seal to foundation walls.
 - c. Overlap joints 6 inches and seal with manufacturer's tape.
 - d. Seal all penetrations (including pipes) per manufacturer's instructions.
 - e. No penetration of the Vapor Barrier/Retarder is allowed except for reinforcing steel and permanent utilities.
 - f. Repair damaged areas by cutting patches of Vapor Barrier/Retarder, overlapping damaged area 6 inches and taping all four sides with tape.

END OF SECTION

SECTION 07 42 13

METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Manufactured metal panels for walls and soffits, with related flashings, and accessory components.

1.02 RELATED REQUIREMENTS

- A. Section 05 40 00 - Cold-Formed Metal Framing: Wall panel substrate.
- B. Section 07 21 00 - Thermal Insulation.
- C. Section 07 90 05 - Joint Sealers.

1.03 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; 2011.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
- C. Samples: Submit two samples of wall panel and soffit panel, 12 inch by 12 inch in size illustrating finish color, sheen, and texture.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that may cause discoloration or staining of products.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a twenty year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
- C. Correct defective Work within a five year period after Substantial Completion, including defects in water tightness and integrity of seals.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Centria; Product CS-200, 12 width wall panel.
- B. Other Acceptable Manufacturers:
 - 1. MBCI: www.mbc.com.
 - 2. Metal Sales Manufacturing Corporation: www.metalsales.us.com.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MANUFACTURED METAL PANELS

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
 - 1. Provide exterior panels and soffit panels.
 - 2. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall.
 - 3. Maximum Allowable Deflection of Panel: 1/90 of span.
 - 4. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
 - 5. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
 - 6. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
 - 7. Corners: Factory-fabricated in one continuous piece with minimum 18 inch returns.
 - 8. Exterior Finish: Panel manufacturer's standard metallic 3-coat polyvinylidene fluoride (PVF) coating, top coat over epoxy primer.
 - 9. Exterior Panel Back Coating: Panel manufacturer's standard polyester wash coat.
- B. Exterior Panels:
 - 1. Profile: Vertical.
 - 2. Side Seams: Double-interlocked, tight-fitting, sealed with continuous bead of sealant.
 - 3. Material: Precoated steel sheet, minimum 22 gage thick.
 - 4. Panel Width: 12 inches.
 - 5. Color: As selected by Architect from manufacturer's metallic 3-coat line.
- C. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; brake formed to required angles.
- D. Expansion Joints: Same material, thickness and finish as exterior sheets; 24 gage; manufacturer's standard brake formed type, of profile to suit system.
- E. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- F. Anchors: Galvanized steel or Stainless steel.

2.03 MATERIALS

- A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.04 ACCESSORIES

- A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.
- B. Sealants: As specified in Section 07 90 05.
- C. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized.
- D. Field Touch-up Paint: As recommended by panel manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that building framing members are ready to receive panels.
- B. Verify that water-resistive barrier has been installed over substrate completely and correctly.

3.02 INSTALLATION

- A. Install panels on walls and soffits in accordance with manufacturer's instructions.
- B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
- C. Fasten panels to structural supports; aligned, level, and plumb.
- D. Locate joints over supports. Lap panel ends minimum 2 inches.
- E. Provide expansion joints where indicated.
- F. Use concealed fasteners unless otherwise approved by Architect.
- G. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.03 TOLERANCES

- A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.
- B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

3.04 CLEANING

- A. Remove site cuttings from finish surfaces.
- B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION

SECTION 07 53 00

ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Elastomeric roofing membrane, adhered conventional application.
- C. Insulation, flat and tapered.
- D. Flashings.
- E. Roofing stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood nailers and curbs.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings.

1.03 REFERENCE STANDARDS

- A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2012.
- B. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2012.
- C. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.
- D. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.
- E. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.
- F. UL (RMSD) - Roofing Materials and Systems Directory; Underwriters Laboratories Inc.; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
 - 1. LEED Submittal: Include testing documentation of solar reflectance index.
- C. Shop Drawings: Indicate joint or termination detail conditions and conditions of interface with other materials.

- D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- E. Manufacturer's Field Reports: Indicate procedures followed and supplementary instructions given.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.

1.08 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 95 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.09 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. EPDM Membrane Materials:
 - 1. Basis of Design: Carlisle SynTec; Sure-White EPDM: www.carlisle-syntec.com.
 - 2. Firestone Building Products Co: www.firestonebpco.com.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulation:
 - 1. Atlas Roofing Corporation: www.atlasroofing.com.
 - 2. Basis of Design: Carlisle SynTec.

2.02 ROOFING

- A. Elastomeric Membrane Roofing: One ply membrane, fully adhered, over insulation.

- B. Roofing Assembly Requirements:
 - 1. Solar Reflectance Index (SRI): 78, minimum, calculated in accordance with ASTM E1980, based on 3-year aged data.
 - a. Field applied coating may not be used to achieve specified SRI.
 - 2. Roof Covering External Fire-Resistance Classification: UL Class A.
 - 3. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance with FM DS 1-28.
- C. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.
 - 1. Minimum 2 layers of polyisocyanurate board.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); non-reinforced; complying with minimum properties of ASTM D 4637.
 - 1. Thickness: 0.060 inch.
 - 2. Color: White.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane; conforming to the following:
 - 1. Thickness: 90 mil.
 - 2. Tensile Strength: 1,200 psi.
 - 3. Elasticity: 50 percent with full recovery without set.
 - 4. Color: White.

2.04 INSULATION

- A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type II, Class 1, cellulose felt or glass fiber mat both faces; Grade 1 and with the following characteristics:
 - 1. Compressive Strength: 16 psi
 - 2. Board Size: 48 x 96 inch.
 - 3. Thermal Resistance: R-value of 20.1.
 - 4. Board Edges: Square.
 - 5. Manufacturer: as approved by membrane manufacturer.

2.05 COVER BOARD

- A. Fiberglass Mat Gypsum Roof Board:
 - 1. Manufacturer: Georgia Pacific; Product: DensDeck Prime.
 - 2. Thickness: 1/2 inch.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 ACCESSORIES

- A. Prefabricated Roofing Expansion Joint Flashing: Sheet butyl over closed-cell foam backing seamed to galvanized steel flanges.
- B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- C. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.
- D. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
- E. Membrane Adhesive: As recommended by membrane manufacturer.

- F. Insulation Adhesive: As recommended by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips are in place.

3.02 METAL DECK PREPARATION

- A. Install preformed sound absorbing glass fiber insulation strips in acoustic deck flutes. Install in accordance with manufacturer's instructions.

3.03 INSULATION - UNDER MEMBRANE

- A. Attachment of Insulation: Mechanically fasten each layer of insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
- B. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.
- C. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
- D. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- E. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.
- F. Do not apply more insulation than can be covered with membrane in same day.

3.04 MEMBRANE APPLICATION

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Apply adhesive to substrate at manufacturer's required rate. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. Around roof penetrations, seal flanges and flashings with flexible flashing.
- G. Install roofing expansion joints where indicated. Make joints watertight.

1. Install prefabricated joint components in accordance with manufacturer's instructions.
- H. Coordinate installation of roof drains and related flashings.
- I. Install oil resistant ECO/CO roof membrane overlay within 10 feet of kitchen exhaust systems.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field quality control and inspection.
- B. Require site attendance of roofing and insulation material manufacturers daily during installation of the Work.

3.06 CLEANING

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Fabricated sheet metal items, including flashings and counterflashings.
- C. Precast concrete splash pads.

1.02 RELATED REQUIREMENTS

- A. Section 04 20 00 - Unit Masonry: Through-wall flashings in masonry.
- B. Section 07 53 00 - Elastomeric Membrane Roofing: Roofing system.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2011.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- C. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two samples 6 x 6 inch in size illustrating metal finish color.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 FLASHING TYPES

- A. Flashing Type 1: 2 piece interlocking type. Not Used.
- B. Flashing Type 2: Masonry thru-wall type: Refer to Section 04 20 00, Unit Masonry.
- C. Flashing Type 3: Roofing base flashing type: Refer to Section 07 53 00, Elastomeric Membrane Roofing.
- D. Flashing Type 4: Formed metal flashing (other than Type 1): Materials and locations specified below.

2.02 SHEET MATERIALS (FLASHING TYPE 4)

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal, shop pre-coated with PVDF coating.
 - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; metallic 3-coat, thermally cured fluoropolymer finish system.
 - 2. Color: To match sheet metal roofing.
 - 3. Location: Trim and flashing around metal roofing, as shown on Drawings.

2.03 ACCESSORIES

- A. Fasteners: Stainless steel.
- B. Underlayment: Self-adhering rubber-modified asphalt sheet complying with ASTM D 1970; 22 mil total thickness; with strippable release film and woven polypropylene sheet top surface.
- C. Primer: Zinc chromate type.
- D. Protective Backing Paint: Zinc molybdate alkyd.
- E. Sealant: Type 1 specified in Section 07 90 05.
- F. Plastic Cement: ASTM D4586, Type I.

2.04 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.

- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

- A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.

END OF SECTION

SECTION 07 71 00

ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Manufactured roof specialties, including copings and fascias.
- C. Roof control and expansion joint covers.

1.02 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2011.
- B. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.
- C. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; Single Ply Roofing Industry; 2003. (ANSI/SPRI ES-1)

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
- D. Samples: Submit two appropriately sized samples of coping and gravel stop.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual details.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Roof Edge Flashings and Copings:
 - 1. Basis of Design: W.P. Hickman Company; Extruded TerminEdge: www.wph.com.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Control and Expansion Joint Covers:
 - 1. GAF Materials Corporation: www.gaf.com.
 - 2. Johns Manville Corporation: www.jm.com.
 - 3. MM Systems Corp: www.mmsystemscorp.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 COMPONENTS

- A. Roof Edge Flashings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
 - 1. Configuration: Fascia and edge securement for roof membrane;
 - 2. Pull-Off Resistance: Tested in accordance with SPRI ES-1 RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable code.
 - 3. Material: Extruded aluminum, 0.08 inch thick, minimum.
 - 4. Finish: 70 percent polyvinylidene fluoride.
 - 5. Color: To match sanding seam metal roofing.
 - 6. Products:
 - a. W.P. Hickman Company; Extruded TerminEdge: www.wph.com.
- B. Copings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
 - 1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness and finish as cap; concealed stainless steel fasteners.
 - 2. Pull-Off Resistance: Tested in accordance with SPRI ES-1 RE-3 to positive and negative design wind pressure as defined by applicable code.
- C. Control and Expansion Joint Covers: Composite construction of 6 inch wide flexible EPDM flashing of white color with closed cell urethane foam backing, each edge seamed to stainless steel sheet metal flanges, designed for nominal joint width of 1 inch. Include special formed corners, tees, intersections, and wall flashings, each sealed watertight.

2.03 FINISHES

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; metallic 3-coat, thermally cured fluoropolymer finish system; color as scheduled.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install components in accordance with manufacturer's instructions.
- B. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- C. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

END OF SECTION

SECTION 07 72 00

ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Manufactured curbs, equipment rails, and pedestals.
- C. Roof hatches.

1.02 RELATED REQUIREMENTS

- A. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.
- B. Section 07 71 00 - Roof Specialties: Other manufactured roof items.

1.03 REFERENCE STANDARDS

1.04 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.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: For non-penetrating rooftop supports, submit detailed layout developed for this project, with design calculations for loadings and spacings.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

PART 2 PRODUCTS

2.01 MANUFACTURED CURBS

- A. Manufactured Curbs, Equipment Rails, and Other Roof Mounting Assemblies: Factory-assembled hollow sheet metal construction with fully mitered and welded corners, integral counterflashing, internal reinforcing, and top side and edges formed to shed water.
 - 1. Manufacture curb bottom and mounting flanges for installation directly on roof deck, not on insulation; match slope and configuration of roof deck.
 - 2. Provide the layouts and configurations shown on the drawings.

2.02 ROOF HATCHES

- A. Manufacturers - Roof Hatches:
 - 1. Basis of Design: Bilco Company; Type S (ladder access, standard size, solid cover): www.bilco.com.

2. Dur-Red Products: www.dur-red.com.
 3. Milcor by Commercial Products Group of Hart & Cooley, Inc: www.milcorinc.com.
 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Roof Hatches: Factory-assembled steel frame and cover, complete with operating and release hardware.
1. Style: Provide flat metal covers unless otherwise indicated.
 2. Mounting: Provide frames and curbs suitable for mounting conditions indicated on the drawings.
- C. Frames/Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
1. Material: Galvanized steel, 14 gage, 0.0747 inch thick.
 2. Finish: Factory prime paint.
 3. Insulation: 1 inch rigid glass fiber, located on outside face of curb.
 4. Curb Height: 12 inches from finished surface of roof, minimum.
- D. Metal Covers: Flush, insulated, hollow metal construction.
1. Capable of supporting 40 psf live load.
 2. Material: Galvanized steel; outer cover 14 gage, 0.0747 inch thick, liner 22 gage, 0.03 inch thick.
 3. Finish: Factory prime paint.
 4. Insulation: 1 inch rigid glass fiber.
 5. Gasket: Neoprene, continuous around cover perimeter.
- E. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
 2. Hinges: Heavy duty pintle type.
 3. Hold open arm with vinyl-coated handle for manual release.
 4. Latch: Upon closing, engage latch automatically and reset manual release.
 5. Manual Release: Pull handle on interior.
 6. Locking: Padlock hasp on interior.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing weather integrity.

3.04 CLEANING

- A. Clean installed work to like-new condition.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 84 13

HVAC & PLUMBING PENETRATION FIRESTOPPING

PART 1 GENERAL

1.01 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section includes:
 - 1. Through-penetration firestopping in fire rated construction.
 - 2. Through-penetration smoke-stopping in smoke partitions.
- C. Related items:
 - 1. Fire dampers and manufactured devices: Refer to Division 23 Section *HVAC Air Distribution*.
 - 2. Smoke dampers and combination fire/smoke dampers. Refer to Division 23 Section *HVAC Air Distribution*.

1.02 REFERENCES

- A. Underwriters Laboratories
 - 1. UL Fire Resistance Directory
 - a. Through-penetration firestop devices (XHCR)
 - b. Fire resistance rating (BXUV)
 - c. Through-penetration firestop systems (XHEZ)
 - d. Fill, void, or cavity material (XHHW)
- B. American Society for Testing and Materials Standards:
 - 1. ASTM E 814-88: Standard Test Method for Fire Tests of Through-Penetration Firestops.

1.03 DEFINITIONS

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time-rated fire walls, smoke barrier walls, time-rated ceiling/floor assemblies and structural floors.

- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire, gasses and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
- E. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.
- F. Sleeve: Metal fabrication or pipe section extended through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.04 SYSTEM DESCRIPTION

- A. Design Requirements
 - 1. Fire-rated construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations.
 - 2. Smoke barrier construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations.

1.05 SUBMITTALS

- A. Submit in accordance with Division 01 Section *Submittal Procedures*, unless otherwise indicated.
- B. Product data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
- C. Shop drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
 - 1. Details of each proposed assembly identifying intended products and applicable UL system number, or UL classified devices.
 - 2. Manufacturer or manufacturer's representative shall provide qualified engineering judgment and drawings relating to non-standard applications as needed.
- D. Quality control submittals:
 - 1. Statement of qualifications.
- E. Applicators' qualifications statement:

1. List past projects indicating required experience.

1.06 QUALITY ASSURANCE

- A. Installer's qualifications: Fire experienced in installation or application of systems similar in complexity to those required for this project, plus the following:
 1. Acceptable to or licensed by manufacturer, State or local authority where applicable.
 2. At least 2 years experience with systems.
 3. Successfully completed at least 5 comparable scale projects using this system.
- B. Local and State regulatory requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL Firestop System numbers, or UL classified devices.
- C. Materials shall have been tested to provide fire rating at least equal to that of the construction.
- D. LEED Submittal:
 1. Product Data for Credit MR 4.1 (and Credit MR4.2): For products having recycled content, required documentation for LEED submittal indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content. See Division 01 Sections related to LEED.
 2. Product Data for Credit MR 5.1 (and MR 5.2): For product manufactured, assembled, or extracted within 500 miles of project site, documentation as required for LEED submittal. Include statement indicating costs for each product that is regional. See Division 01 Sections related to LEED.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Packing and shipping:
 1. Deliver products in original unopened packaging with legible manufacturer's identification.
 2. Coordinate delivery with scheduled installation date, allow minimum storage at site.
- B. Storage and protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.08 PROJECT CONDITIONS

- A. Existing condition:

1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
 2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.
- B. Environmental requirements:
1. Furnish adequate ventilation if using solvent.
 2. Furnish forced air ventilation during installation if required by manufacturer.
 3. Keep flammable materials away from sparks or flame.
 4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

1.09 WARRANTY

- A. Submit copies of written warranty agreeing to repair or replace joint sealers which fail in joint adhesion, extrusion resistance, migration resistance, or general durability or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The warranty period shall be two (2) years from date of substantial completion unless otherwise noted.

PART 2 PRODUCTS

2.01 THROUGH-PENETRATION FIRESTOPPING OF FIRE-RATED CONSTRUCTION

- A. Systems of devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos-free.
1. Additional requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designed to perform this function.
 2. Acceptable manufacturers and products.
 - a. Those listed in the UL Fire Resistance directory for the UL System involved and as further defined in the System and Applications Schedule in Part 3.6 of this section.
 3. All firestopping products must be from a single manufacturer. All trades shall use products from the same manufacturer unless otherwise noted.

2.02 SMOKE-STOPPING AT SMOKE PARTITIONS

- A. Through-penetration smoke-stopping: Any system complying with the requirements for through-penetration firestopping in fire-rated construction, as specified in The Systems and Applications Schedule in Part 3.6 of this section, is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

2.03 ACCESSORIES

- A. Fill, void or cavity materials: As classified under category XHHW in the UL Fire Resistance Directory.
- B. Forming materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.
- B. Coordinate an inspection of all Mechanical Firestopping systems with the Fire Marshal prior to installation of ceilings, walls, etc.

3.02 PREPARATION

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.03 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Protect materials from damage on surfaces subject to traffic.
- D. When large openings are created in walls or floors to permit installation of pipes, ducts, or other items, close unused portions of opening with firestopping materials tested for the application. See UL Fire Resistance Directory or Section 3.6 of this document.
- E. Install smoke stopping as specified for firestopping.

3.04 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Perform under this section patching and repairing of firestopping caused by cutting or penetration by other trades.

3.05 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

3.06 SYSTEMS AND APPLICATION SCHEDULES*

PENETRATING ITEM	CONCRETE	GYPSUM	WOOD FLOOR/CEILING
Metal Pipe	CAJ1001 CP25S/L, CP25N/S CAJ1006 CS-195+, FS-195+ CAJ1007 FS-195+, 1-inch& 2-inch Wide CAJ1009 2000, 2000+, 2003 CAJ1010 2000, 2000+, 2003 CAJ1012 2000, 2000+, 2003 CAJ1013 2000, 2000+, 2003 CAJ1014 2000, 2000+, 2003 CAJ1015 2000, 2000+, 2003 CAJ1017 FD 150 CAJ1021 FD 150 CAJ1027 MPS-2+ CAJ1044 CP 25WB+ CAJ1052 CP 25S/L, CP 25N/S CAJ1058 2000, 2000+, 2003 CAJ1060 2000, 2000+, 2003 CAJ1063 2000, 2000+, 2003 CAJ1066 CP 25N/S,CP 25S/L, CP 25WB+ CAJ1091 CP 25N/S,CP 25S/L, CP 25WB+ CAJ1092 CP 25WB+ CAJ1112 FS-195+ CAJ1160 CP 25S/L, CP 25N/S CAJ1175 CP 25WB+ CAJ1176 CP 25WB+ CAJ1188 2000+ CBJ1020 CS-195+, FS-195+ CBJ1021 CS-195+, MPS-2+ CBJ1031 2001 CBJ1032 2001 FA1002 CP 25WB+ WJ1010 CP25WB+ WJ1023 2001	WL1001 CP 25 WL1002 FS-195+ WL1003 CP 25WB+,CP 25N/S WL1008 2000+ WL1009 2000+ WL1010 2000+ WL1016 CP 25WB+ WL1017 CP 25WB+,CP 25N/S WL1032 CP 25WB+,CP 25N/S WL1036 FD 150 WL1037 CS-195+,FS-195+ WL1067 CP 25N/S WL1073 CP 25WB+ WL1080 MPS2+ WL1082 2000+	FC1002 CP 25 FC1003 2000,2000+,20003 FC1006 CP 25WB+
Non-Metallic	CAJ2001 FS-195+, 1-inch& 2-inch WIDE, PPD'S CAJ2002 FS-195+ CAJ2003 CS-195+, FS-195+ CAJ2005 FS-195 CAJ2006 FS-195+ CAJ2013 FS-195+ CAJ2019 2000, 2000+, 2003 CAJ2027 FS-195+, CP 25N/S, CP 25S/L, CP 25WB+ CAJ2028 FS-195, MPS-2+ CAJ2029 FS-195+, PPD'S CAJ2030 CS-195+, FS-195+ CAJ2040 FS-195+, CP 25WB+ CAJ2044 FS-195+, CP 25N/S, CP 25S/L CP 25 WB+ CAJ2090 FS-195+ CAJ2177 FS-195+, PPD'S FA2001 FS-195+, PPD'S FS2002 CS-195+, FS-195+, MPS-2+, PPD'S FA2011 FS-195+ WJ2012 FS-195+ 1-inch WIDE	WL2002 FS-195+, PPD'S WL2003 FS-195+ WL2004 FS-195+ WL2005 FS-195+ 4' WIDE WL2006 FS-195+ WL2013 FS-195+ WL2031 CS-195+, FS-195+ WL2032 CS-195+, FS-195+ WL2033 FS-195+ WL2073 FS-195+ 1-inch WIDE	FC2002 FS-195+, PPD'S FC2007 FS-195+, PPD'S FC2008 FS-195+ FC2009 FS-195+, PPD'S FC2024 FS-195 FC2026 FS-195+ FC2028 FS-195, 1' & 2-inch WIDE, PPD'S

PENETRATING ITEM	CONCRETE	GYPSUM	WOOD FLOOR/CEILING
Insulated Metallic Pipe	CAJ5001 CP 25N/S, CP 25S/L, CP 25WB+ CAJ5002 FS-195+ CAJ5003 FS-195+ CAJ5005 MPS-2+ CAJ5009 2000+, 2003 CAJ5017 FS-195+, CP 25 CAJ5022 FS-195+ CAJ5024 FS-195+ CAJ5030 CS-195+, FS-195+ CAJ5041 2000, 2000+, 2003 CAJ5060 CP 25WB+ CAJ5074 2000+ CBJ5002 CP 25 CBJ5003 FS-195+ FA5001 FS-195+, CP 25WB+	WL5001 FS-195+ WL5002 FS-195+ WL5009 FS-195+ WL5010 FS-195+ WL5011 CP 25WB+ WL5032 2000+ WL5038 CP 25WB+ WL5039 CP 25WB+ WL5040 CP 25WB+ WL5045 CP 25WB+ WL5053 2000+	FC5002 FS-195+ FC5008 FS-195+
Miscellaneous Mechanical HVAC Ducts	CAJ7001 CP 25N/S CP 25S/L CAJ7003 CP 25WB+ CAJ7009 DUCT WRAP, BULK PUTTY		FC7001 CP 25S/L, CP 25N/S
Mixed Penetrating Items Combos	CAJ8001 CS-195+ FS-195 CAJ8003 2000, 2000+, 20003 CAJ8004 2000, 2000+, 20003 CAJ8006 2001 CAJ8013 FS-195+, CP 25 CBJ8004 CS-195, FS-195+ CBJ8005 CS-195+, MPS-2+ CBJ8008 2001 FA8001 FS-195+, CP 25WB+	WL8002 CS-195+, FS-195+	

* Underwriter's Laboratories, Inc., Fire Resistance Directory.

END OF SECTION

SECTION 07 90 05

JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Sealants and joint backing.
- C. Precompressed foam sealers.

1.02 REFERENCE STANDARDS

- A. ASTM C834 - Standard Specification for Latex Sealants; 2010.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2011.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2011a.
- D. ASTM D1667 - Standard Specification for Flexible Cellular Materials--Poly(Vinyl Chloride) Foam (Closed-Cell); 2005 (Reapproved 2011).
- E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.03 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. LEED Report: Submit VOC content documentation for all non-preformed sealants and primers.
- D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum 5 years experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.

1.05 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.06 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.07 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.

PART 2 PRODUCTS

2.01 SEALANTS

- A. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Type 1 - General Purpose Exterior Sealant: Silicone; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component.
 - 1. Color: To be selected by Architect from manufacturer's full range.
 - 2. Joint Movement Range: +/- 50 percent.
 - 3. Product:
 - a. SilPruf NB SCS9000 manufactured by Momentive Performance Materials, Inc (formerly GE Silicones).
 - b. 890FTS manufactured by Pecora Corporation.
 - c. 890FTS TXTR manufactured by Pecora Corporation.
 - d. 795 manufactured by Dow Corning.
 - 4. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.
 - d. Joints in manufactured masonry veneer system.
- C. Type 2 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
 - 1. Color: Colors as selected.
 - 2. Applications: Use for:
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.
- D. Type 3 - Coal tar extended, fuel resistant polyurethane sealant: Not Used.
- E. Type 4 - Fire Resistant Foam Sealant:
 - 1. Manufacturers:
 - a. Dow Corning: Product: 3-6548 RTV Foam.
- F. Type 5 - Exterior Expansion Joint Sealer: Not Used
- G. Type 6 - Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
 - 1. Applications: Use for:
 - a. Joints between plumbing fixtures and floor and wall surfaces.
 - b. Joints between kitchen and bath countertops and wall surfaces.
- H. Type 7 - Butyl Sealant: Not Used
- I. Type 8 - Acoustical Sealant: Not Used.

2.02 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; open cell polyurethane or reticulated (soft) polyethylene; oversized 33 to 50 percent larger than joint width; Denver Foam manufactured by Backer Rod Manufacturing, Inc.
- D. Fire Rated Joint Filler: Pre-engineered, patented, flexible, textile fiberglass roll material with a fiberglass matt facing, containing approximately 30 percent by weight unexpanded vermiculite; Ultra Block manufactured by Backer Rod Manufacturing, Inc.
- E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces and joint openings are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 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.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve the following:
 - 1. Width/depth ratio of 2:1.
 - a. Minimum joint depth: 1/4 inch; Maximum joint depth: 1/2 inch, unless otherwise required by manufacturer.
 - 2. Neck dimension no greater than 1/3 of the joint width.
 - 3. Surface bond area on each side not less than 75 percent of joint width.
- D. Install backer rod using blunt or rounded tool to a uniform (+/- 1/8 inch) depth without puncturing the material.
- 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.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION

- A. Protect sealants until cured.

3.06 SCHEDULE

- A. Exterior Joints for Which No Other Sealant Type is Indicated: Type 1; colors as selected.
- B. Interior Joints for Which No Other Sealant is Indicated: Type 2; color as selected.
- C. Penetrations of Fire Rated Construction: Type 1 with Ultra Block joint filler or Type 4.
- D. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls: Type 6.

END OF SECTION

SECTION 080671

DOOR HARDWARE SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section references specification sections relating to commercial door hardware for the following:

- 1. Swinging doors.
- 2. Sliding Doors.
- 3. Other doors to the extent indicated.

- B. Commercial door hardware includes, but is not necessarily limited to, the following:

- 1. Mechanical door hardware.
- 2. Electromechanical and access control door hardware.
- 3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
- 4. Automatic operators.
- 5. Cylinders specified for doors in other sections.

- C. Related Sections:

- 1. Section 08 11 13 - Hollow Metal Doors and Frames.
- 2. Section 08 14 16 - Flush and Clad Wood Doors.
- 3. Section 08 14 33 - Stile and Rail Wood Doors.
- 4. Section 08 17 00 - Integrated Door Opening Assemblies.
- 5. Section 08 41 13 - Aluminum Framed Entrances and Storefronts.
- 6. Section 08 42 26 - All-Glass Entrances.
- 7. Section 08 71 00 - Door Hardware.
- 8. Section 08 71 13 - Automatic Door Operators.
- 9. Section 08 74 00 - Access Control Hardware.
- 10. Section 28 13 00 - Access Control.

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.

2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. [State Building Codes, Local Amendments].

- E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system

explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

- D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum [5] years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum [3] years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum [5] years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of Door Hardware specified in the Related Sections from a single source, qualified supplier unless otherwise indicated.
- E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the applicable model building code.
- F. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets at the end of Part 3 of each referenced section that products are to be supplied under.

1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
 - B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.3 FINISHES

- A. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 or traditional U.S. finishes shown by certain manufacturers for their products.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

- A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. The supplier is responsible for handing and sizing all products as listed in the door hardware sets. Quantities listed are for each pair of doors, or for each single door.
- C. Products listed in the Door Hardware Sets are to be provided under and meet the requirements described in the specification sections noted.
 1. Section 08 71 00 – Door Hardware.
 2. Section 08 74 00 – Access Control Hardware.

D. Manufacturer's Abbreviations:

1. MK - McKinney
2. RO - Rockwood
3. SA - Sargent
4. BE - Stanley Security Solutions Inc (BE)
5. RF - Rixson
6. PE - Pemko
7. SU - Securitron
8. 00 - Other

Hardware Schedule

Set: 00.15.10

Doors: F116, FH110

2	Continuous Hinge	MCK-12HD SER-12 x LAR	CL	MK
1	Removable Mullion	L980S	PC	SA
1	Exit Device	16 55 56 8804 FLL LC	US32D	SA
1	Exit Device	16 55 8810 FLL	US32D	SA
4	Cylinder	1E-72/1E-74	626	BE
2	Door Closer	351 P10	EN	SA
2	Mop Plate	K1050 10" x 1" LDW 4BE	US32D	RO
2	Door Stop	471 EXP	US26D	RO
1	Threshold	271A x LAR MSES25SS		PE
1	Gasketing	S88D (Head & Jambs)		PE
1	Rain Guard	346C		PE
2	Sweep	3452CNB x LAR		PE
2	eLynx Frame Harness	QC-C1500P		MK
2	eLynx Door Harness	QC-C*** (Length / Type as Required)		MK
1	Power Supply	BPS (size & type as required)		SU
1	Wiring Diagram	Complete with point to point drawing		OT

Notes: A valid credential at the card reader (specified elsewhere) retracts the latches on the active door exit device allowing entry. Key override. Free egress at all times.

Set: 00.25.10

Doors: FH114, FH117

1	Continuous Hinge	MCK-12HD x LAR	CL	MK
1	Continuous Hinge	MCK-12HD SER-12 x LAR	CL	MK
1	Flush Bolt	2842	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Fail Secure Electric Lock	RX 8271-24V LNL LC	US26D	SA
1	Cylinder	1E-72/1E-74	626	BE
1	Coordinator	1700	Black	RO
2	Door Closer	351 P10	EN	SA
2	Mop Plate	K1050 10" x 1" LDW 4BE	US32D	RO
2	Door Stop	471 EXP	US26D	RO
1	Threshold	271A x LAR MSES25SS		PE
1	Gasketing	S88D (Head & Jambs)		PE
1	Rain Guard	346C		PE
1	Sweep	3452CNB x LAR		PE
1	Astragal	357SP		PE
1	eLynx Frame Harness	QC-C1500P		MK
1	eLynx Door Harness	QC-C*** (Length / Type as Required)		MK
1	Power Supply	BPS (size & type as required)		SU
1	Wiring Diagram	Complete with point to point drawing		OT

Notes: Valid credential at reader momentarily releases the fail secure lockset allowing entry. Key override. Free egress at all times. If it is determined that access control isn't used at this time, change lock model to 8225 LNL.

Set: 00.25.66

Doors: FH200, FH207A, FH208

1	Continuous Hinge	MCK-12HD SER-12 x LAR	CL	MK
1	Fail Secure Electric Lock	RX 8271-24V LNL LC	US26D	SA
1	Cylinder	1E-72/1E-74	626	BE
1	Door Closer	351 CPSH	EN	SA
1	Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
1	Threshold	271A x LAR MSES25SS		PE
1	Gasketing	S88D (Head & Jambs)		PE
1	Rain Guard	346C		PE
1	Sweep	3452CNB x LAR		PE
1	eLynx Frame Harness	QC-C1500P		MK
1	eLynx Door Harness	QC-C*** (Length / Type as Required)		MK
1	Power Supply	BPS (size & type as required)		SU
1	Wiring Diagram	Complete with point to point drawing		OT

Notes: Valid credential at reader momentarily releases the fail secure lock allowing entry. Key override. Free egress at all times. If it is determined that access control isn't used at this time, change lock model to 8225 LNL.

Set: 25.04.07

Doors: FH106, FH130A, FH130B, FH135

6 Hinge	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
2 Manual Flush Bolt	555	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom Lock	8204 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
2 Surface Overhead Holder/Stop	9ADJ-026	630	RF
2 Mop Plate	K1050 10" x 1" LDW 4BE	US32D	RO
1 Threshold	271A x LAR MSES25SS		PE
1 Gasketing	S88D (Head & Jambs)		PE
1 Rain Guard	346C		PE
2 Sweep	3452CNB x LAR		PE
1 Astragal	357SP		PE

Set: 25.04.66

Doors: FH136, FH402, FH404, FH406, FH408

3 Hinge	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Storeroom Lock	8204 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Door Closer	351 CPSH	EN	SA
1 Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
1 Threshold	271A x LAR MSES25SS		PE
1 Gasketing	S88D (Head & Jambs)		PE
1 Sweep	3452CNB x LAR		PE

Set: 25.25.66

Doors: FH105A, FH108, FH109, FH134A, FH137, FH138, FH205A, FH301A, FH301B

3 Hinge	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Dormitory Lock	8225 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Door Closer	351 CPSH	EN	SA
1 Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
1 Threshold	271A x LAR MSES25SS		PE
1 Gasketing	S88D (Head & Jambs)		PE
1 Rain Guard	346C		PE
1 Sweep	3452CNB x LAR		PE

Set: 25.64.16

Doors: FH101, FH103

6 Hinge	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
2 Flush Bolt	2842	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Mortise Deadlock	4877 LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
2 Door Pull	111	US32D	RO
2 Push Plate	70F CFC	US32D	RO
1 Coordinator	1700	Black	RO
2 Door Closer	351 P10	EN	SA
2 Mop Plate	K1050 10" x 1" LDW 4BE	US32D	RO
2 Door Stop	471 EXP	US26D	RO
1 Threshold	271A x LAR MSES25SS		PE
1 Gasketing	S88D (Head & Jambs)		PE
2 Sweep	3452CNB x LAR		PE
1 Astragal	357SP		PE

Set: 25.64.60

Doors: FH131, FH133

3 Hinge	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Mortise Deadlock	4877 LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Door Pull	111	US32D	RO
1 Push Plate	70F CFC	US32D	RO
1 Door Closer	351 O/P9	EN	SA
1 Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
1 Door Stop	471 EXP	US26D	RO
1 Threshold	271A x LAR MSES25SS		PE
1 Gasketing	S88D (Head & Jambs)		PE
1 Sweep	3452CNB x LAR		PE

Set: 45.13.10

Doors: FH115B

2 Continuous Hinge	MCK-12HD x LAR	CL	MK
1 Exit Device	16 NB8743 ETL LC	US32D	SA
1 Exit Device	16 NB8740 ETL LC	US32D	SA
3 Cylinder	1E-72/1E-74	626	BE

2 Door Closer	351 P10	EN	SA
2 Mop Plate	K1050 10" x 1" LDW 4BE	US32D	RO
2 Door Stop	409	US32D	RO
2 Silencer	608		RO

Set: 45.13.60

Doors: FH115A

1 Continuous Hinge	MCK-12HD x LAR	CL	MK
1 Exit Device	16 8843 ETL LC	US32D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Door Closer	351 P10	EN	SA
1 Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
1 Door Stop	409	US32D	RO
3 Silencer	608		RO

Set: 55.04.50

Doors: FH102, FH118, FH132, FH202, FH206

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lock	8204 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
1 Door Stop	409	US32D	RO
3 Silencer	608		RO

Set: 55.04.57

Doors: FH104

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Storeroom Lock	8204 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Surface Overhead Holder/Stop	9ADJ-026	630	RF
1 Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
3 Silencer	608		RO

Set: 55.37.10

Doors: FH111A, FH119A

2 Continuous Hinge	MCK-12HD x LAR	CL	MK
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1 Flush Bolt	2842	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Classroom Lock	8237 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Coordinator	1700	Black	RO
2 Door Closer	351 P10	EN	SA
2 Mop Plate	K1050 10" x 1" LDW 4BE	US32D	RO
1 Door Stop	409	US32D	RO
1 Door Stop	471 EXP	US26D	RO
2 Silencer	608		RO

Set: 55.37.50

Doors: FH112, FH204, FH212

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Classroom Lock	8237 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Door Stop	409	US32D	RO
3 Silencer	608		RO

Set: 55.37.57

Doors: FH107, FH223

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Classroom Lock	8237 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Surface Overhead Holder/Stop	9ADJ-026	630	RF
3 Silencer	608		RO

Set: 55.37.60

Doors: FH203, FH211

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Classroom Lock	8237 LNL LC	US26D	SA
1 Cylinder	1E-72/1E-74	626	BE
1 Door Closer	351 O/P9	EN	SA
1 Kickplate	K1050 10" x 2" LDW 4BE	US32D	RO
1 Door Stop	409	US32D	RO
3 Silencer	608		RO

Set: 55.99.10

Doors: FH111B, FH119B

2	Continuous Hinge	MCK-12HD x LAR	CL	MK
2	Door Pull	111	US32D	RO
2	Pull Plate	110x70C	US32D	RO
2	Door Closer	351 P10	EN	SA
2	Mop Plate	K1050 10" x 1" LDW 4BE	US32D	RO
2	Door Stop	409	US32D	RO
2	Silencer	608		RO

Set: 99.99.99

Doors: FH105B, FH105C, FH134B, FH134C, FH134D, FH134F, FH134H, FH206B, FH206C, FH207B, FH207C, FH207D, FH301C, FH301D, FH301E, FH301F

1	All Hardware by Door Supplier			00
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END OF SECTION 080671

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Non-fire-rated steel doors and frames.
- C. Thermally insulated steel doors.

1.02 RELATED REQUIREMENTS

- A. Section 08 71 00 - Door Hardware.
- B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
- C. Section 09 90 00 - Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
- B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
- C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2004).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- E. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.
- F. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).
- G. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
- H. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.

1.04 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.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.
- B. Maintain at the project site a copy of all reference standards dealing with installation.

1.06 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

2.01 MANUFACTURERS

- A. Steel Doors and Frames:
 - 1. Assa Abloy Ceco, Curries, or Fleming: www.assaabloydss.com.
 - 2. Republic Doors: www.republicdoor.com.
 - 3. Steelcraft: www.steelcraft.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS AND FRAMES

- A. Requirements for All Doors and Frames:
 - 1. Accessibility: Comply with ANSI/ICC A117.1.
 - 2. Door Top Closures: Flush with top of faces and edges.
 - 3. Door Edge Profile: Beveled on both edges.
 - 4. Door Texture: Smooth faces.
 - 5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
 - 6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
 - 7. Galvanizing for Units in Wet Areas: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
 - 8. Finish: Factory primed, for field finishing.
- 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.

2.03 STEEL DOORS

- A. Exterior Doors:
 - 1. Grade: ANSI A250.8 Level 4, physical performance Level A, Model 2, seamless.
 - 2. Core: Polystyrene foam.
 - 3. Top Closures for Outswinging Doors: Flush with top of faces and edges.
 - 4. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
 - 5. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C1363.
- B. Interior Doors, Non-Fire-Rated:
 - 1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
 - 2. Core: Cardboard honeycomb.
 - 3. Thickness: 1-3/4 inches.

2.04 STEEL FRAMES

- A. General:
 - 1. Comply with the requirements of grade specified for corresponding door, except:
 - a. ANSI A250.8 Level 4 Doors: 12 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 in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
 - 5. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
- B. Exterior Door Frames: Fully welded.
 - 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: Fully welded type.

2.05 ACCESSORY MATERIALS

- A. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed.
 - 1. Style: Sightproof inverted V blade.
- B. Glazing: As specified in Section 08 80 00.
- C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- D. Astragals for Double Doors: Specified in Section 08 71 00.
 - 1. Exterior Doors: Steel, Z-shaped.
- E. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.
- F. 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.
- G. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.06 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

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. Coordinate frame anchor placement with wall construction.
- C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- D. Coordinate installation of hardware.
- E. Coordinate installation of glazing.

3.04 TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Test sound control doors for force to close, latch, and unlatch in accordance with ASTM E1408; adjust as required to comply.

END OF SECTION

SECTION 08 33 23

OVERHEAD COILING DOORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Insulated service doors.
- B. Related Sections:
 - 1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.
 - 2. Section 083333 "Coiling Counter Doors" for coiling counter doors.
 - 3. Section 083326 "Overhead Coiling Grilles" for open-curtain overhead coiling grilles.

1.02 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design overhead coiling doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.
 - 1. Wind Loads:
 - a. Basic Wind Speed: 95 mph.
 - 2. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.
- C. Operability under Wind Load: Design overhead coiling doors to remain operable under design wind load, acting inward and outward.
- D. Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory. Include the following:
 - 1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
 - 2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
 - 3. For fire-rated doors, description of fire-release system including testing and resetting instructions.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.
- C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 1. Curtain Slats: 12 inches long.
- E. Delegated-Design Submittal: For overhead coiling doors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Summary of forces and loads on walls and jambs.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and professional engineer.

1.05 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.
 1. Obtain operators and controls from overhead coiling door manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 - PRODUCTS

2.01 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.028 inch and as required to meet requirements.
 2. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within slat faces.
 3. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face.
- B. Endlocks and Windlocks for Service Doors: Malleable-iron casings galvanized after fabrication, secured to curtain slats with galvanized rivets or high-strength nylon. Provide locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick; fabricated from manufacturer's standard hot-dip galvanized steel, stainless steel, or aluminum extrusions to match curtain slats and finish.

- D. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and a continuous bar for holding windlocks.

2.02 HOOD

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Galvanized Steel: Nominal 0.028-inch- thick, hot-dip galvanized steel sheet with G90 (Z275) zinc coating, complying with ASTM A 653/A 653M.

2.03 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: Provide cylinders specified in Section 087100 "Door Hardware" and keyed to building keying system.
 - 2. Keys: Provide three for each cylinder.
- B. Chain Lock Keeper: Suitable for padlock.
- C. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.04 CURTAIN ACCESSORIES

- A. Smoke Seals: Equip each fire-rated door with smoke-seal perimeter gaskets for smoke and draft control as required for door listing and labeling by a qualified testing agency.
- B. Weatherseals: Equip each exterior door with weather-stripping gaskets fitted to entire perimeter of door for a weathertight installation, unless otherwise indicated.
 - 1. At door head, use 1/8-inch- thick, replaceable, continuous sheet secured to inside of hood.
 - 2. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch- thick seals of flexible vinyl, rubber, or neoprene.
- C. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

2.05 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.

- C. Spring Balance: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.06 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
 - 1. Comply with NFPA 70.
 - 2. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24 V, ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.
- C. Door Operator Location(s): Operator location indicated for each door.
 - 1. Top-of-Hood Mounted: Operator is mounted to the right or left door head plate with the operator on top of the door-hood assembly and connected to the door drive shaft with drive chain and sprockets. Headroom is required for this type of mounting.
- D. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 110513 "Common Motor Requirements for Equipment" unless otherwise indicated.
 - 1. Electrical Characteristics:
 - a. Phase: Single phase.
 - b. Volts: 115/230 V.
 - c. Hertz: 60.
 - 2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
 - 3. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
 - 4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
 - 5. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- F. Obstruction Detection Device: Equip motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.

1. Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Self-Monitoring Type: Four-wire configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.
- G. Remote-Control Station: Momentary-contact, three-button control station with push-button controls labeled "Open," "Close," and "Stop."
 1. Interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf.
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- K. Radio-Control System: Consisting of the following:
 1. Three-channel universal coaxial receiver to open, close, and stop door; one per operator.
 2. Remote-antenna mounting kit.

2.07 INSULATED DOOR ASSEMBLY

- A. Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Overhead Door Corporation; 625 Series Insulated Service Door or comparable product by one of the following:
 - a. C.H.I. Overhead Doors.
 - b. Cookson Company.
 - c. Cornell Iron Works, Inc.
- B. Operation Cycles: Not less than 20,000.
 1. Include tamperproof cycle counter.
- C. Curtain R-Value: 7.7 deg F x h x sq. ft./Btu.
- D. Door Curtain Material: Galvanized steel.
- E. Door Curtain Slats: Flat profile slats of 2-5/8-inch center-to-center height.
 1. Insulated-Slat Interior Facing: Metal.
- F. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
- G. Hood: Match curtain material and finish.
 1. Shape: Round.

2. Mounting: Face of wall.
- H. Locking Devices: Equip door with locking device assembly and chain lock keeper.
 1. Locking Device Assembly: Cremone type, both jamb sides locking bars, operable from inside and outside with cylinders.
- I. Electric Door Operator:
 1. Usage Classification: Medium duty, up to 15 cycles per hour.
 2. Operator Location: Top of hood.
 3. Motor Exposure: Interior.
 4. Emergency Manual Operation: Chain type.
 5. Obstruction-Detection Device: Automatic pneumatic sensor edge on bottom bar ; self-monitoring type.
 - a. Sensor Edge Bulb Color: Black.
 6. Remote-Control Station: Interior.
 7. Other Equipment: Radio-control system.
- J. Door Finish:
 1. Baked-Enamel or Powder-Coated Finish: Color as selected by Architect from manufacturer's full range.
 2. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face.

2.08 GENERAL FINISH REQUIREMENTS

- 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: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.09 STEEL AND GALVANIZED-STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrate areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.03 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Perform installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.04 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide weathertight fit around entire perimeter.

3.05 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION

SECTION 08 33 33

COILING COUNTER DOORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Coiling counter doors.
- B. Related Sections:
 - 1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel supports.
 - 2. Section 08 33 23 "Overhead Coiling Doors" for non-insulated and insulated service doors.

1.02 PERFORMANCE REQUIREMENTS

- A. Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory. Include the following:
 - 1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
 - 2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Curtain Slats: 12 inches long.
 - 2. Bottom Bar: 6 inches long.
 - 3. Guides: 6 inches long.
 - 4. Brackets: 6 inches square.
 - 5. Hood: 6 inches square.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.

1.05 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

- B. Source Limitations: Obtain coiling counter doors from single source from single manufacturer.
 - 1. Obtain operators and controls from coiling counter door manufacturer.
- C. Regulatory Requirements: Comply with applicable provisions in ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.01 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Stainless-Steel Door Curtain Slats: ASTM A 666, Type 304; sheet thickness of 0.025 inch and as required to meet requirements.
 - 2. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.028 inch and as required to meet requirements.
- B. Endlocks for Counter Doors: Manufacturer's standard locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Counter Doors: Manufacturer's standard continuous channel or tubular shape, fabricated from manufacturer's standard hot-dip galvanized steel, stainless steel, or aluminum extrusions to match curtain slats and finish.
- D. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.02 HOOD

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Stainless Steel: 0.025-inch-thick stainless-steel sheet, Type 304, complying with ASTM A 666.
 - 2. Galvanized Steel: Nominal 0.028-inch-thick, hot-dip galvanized steel sheet with G90 (Z275) zinc coating, complying with ASTM A 653/A 653M.

2.03 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: Provide cylinders specified in Section 087100 "Door Hardware" and keyed to building keying system.
 - 2. Keys: Provide three for each cylinder.
- B. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.04 CURTAIN ACCESSORIES

- A. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
 - 1. Smoke Seals: Equip each smoke control door with smoke-seal perimeter gaskets for smoke and draft control as required for door listing and labeling by a qualified testing agency.
 - 2. Provide pull-down straps or pole hooks for doors more than 84 inches high.

2.05 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.
- C. Spring Balance: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.06 COUNTER DOOR ASSEMBLY

- A. Coiling Counter Door: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Overhead Door Corporation; 651 Series Overhead Coiling Counter Doors or comparable product by one of the following:
 - a. Cookson Company.
 - b. Cornell Iron Works, Inc.
- B. Operation Cycles: Not less than 20,000.
 - 1. Include tamperproof cycle counter.
- C. STC Rating: 27.
- D. Door Curtain Material: Stainless steel.
- E. Door Curtain Slats: Flat profile slats of 1-1/2-inch center-to-center height.
- F. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.
- G. Hood: Match curtain material and finish.
 - 1. Shape: Round.
 - 2. Mounting: Face of wall.
- H. Integral Frame, Hood, and Fascia for Counter Door: Stainless steel.
 - 1. Mounting: Face of wall.
- I. Sill Configuration for Counter Door: As indicated.
- J. Locking Devices: Equip door with locking device assembly.

1. Locking Device Assembly: Cremone type, both jamb sides locking bars, operable from inside and outside with cylinders.
- K. Operation: Manual push up.
- L. Door Finish:
 1. Stainless-Steel Finish: No. 4 (polished directional satin).
 2. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face.

2.07 GENERAL FINISH REQUIREMENTS

- 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: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.08 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 1. Run grain of directional finishes with long dimension of each piece.
 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 3. Directional Satin Finish: No. 4.

2.09 STEEL AND GALVANIZED-STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrate areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.

3.03 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 1. Perform installation and startup checks according to manufacturer's written instructions.
 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.04 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

3.05 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION

SECTION 08 43 13

ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Aluminum-framed storefront, with vision glass.
- C. Perimeter sealant.

1.02 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.

1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2012.
- D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass 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.
- D. Design Data: Provide framing member structural and physical characteristics, dimensional limitations.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

1.06 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum five years of experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide 10 year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Glazing Rabbet: For 1 inch insulating glazing.
 - 2. Glazing Rabbet: For 1/4 inch monolithic glazing.
 - 3. Glazing Position: Centered (front to back).
 - 4. Finish: Class I natural anodized.
 - 5. Basis of Design: Subject to compliance with requirements, provide Kawneer North America; TRIFAB 450 for monolithic glazing, TRIFAB 451T for insulating glazing or comparable product by one of the following:
 - a. Other Acceptable Manufacturers:
 - 1) YKK AP America Inc.
 - 2) United States Aluminum Corp.

2.02 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
 - 1. Framing members for interior applications need not be thermally broken.
 - 2. Glazing stops: Flush.
 - 3. Cross-Section: As indicated on drawings.

2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel.
- C. Perimeter Sealant: Type 1 specified in Section 07 90 05.
- D. Glass: As specified in Section 08 80 00.
- E. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.04 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating or AAMA 612 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.

2.05 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.
- 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

3.01 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. Set thresholds in bed of mastic and secure.
- K. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
- L. Install perimeter sealant in accordance with Section 07 90 05.
- M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.02 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.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.

3.04 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.

3.05 PROTECTION

- A. Protect installed products from damage during subsequent construction.

END OF SECTION

SECTION 08 56 55

TICKET WINDOWS

PART 1 - GENERAL

1.01 SUMMARY

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Section Includes:
 - 1. Fixed, transaction ticket windows.

1.02 COORDINATION

- A. Coordinate installation of anchorages for ticket windows. 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 adjacent construction. Deliver such items to Project site in time for installation.

1.03 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for window units.
- B. Shop Drawings: For ticket windows.
 - 1. Include plans, elevations, sections, and attachments to other work.
 - 2. Full-size section details of framing members.
 - 3. Glazing details.
 - 4. Details of deal tray, transaction counter, and speaking aperture.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Framing: 12-inch- long sections of frame members.

1.05 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Pack ticket windows in wood crates for shipment. Crate glazing separate from frames unless factory glazed.
- B. Label ticket window packaging with drawing designation.
- C. Store crated ticket windows on raised blocks to prevent moisture damage.

1.07 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.08 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace ticket windows that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Three (3) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 FIXED, TRANSACTION TICKET WINDOWS

- A. Provide fixed, framed transaction windows with operable sash or ventilator capable of allowing transfer of currency and documents.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide aluminum ticket window, catalog number SCW102N, manufactured by C. R. Laurence, Co. Inc.; or comparable product by one of the following:
 - a. Creative Industries, Inc.
 - b. Quikserv Corp.
- B. Configuration: One fixed-glazed panel.
- C. Framing: Fabricate perimeter framing, mullions, and glazing stops from aluminum as follows:
 - 1. Profile: Manufacturer's standard, with minimum face dimension indicated.
 - a. Minimum Face Dimension: 0.625 inches.
 - 2. Depth: Minimum Dimension: 1.390 inches.
- D. Transaction Counter: 16 gauge, stainless steel, 18 inches deep by width of ticket window, centered in opening.
- E. Glazing: 0.25" tempered glass.
- F. Materials:
 - 1. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
 - 2. Aluminum Extrusions: ASTM B 221. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength.
 - 3. Aluminum Sheet and Plate: ASTM B 209.

2.02 FABRICATION

- A. General: Fabricate ticket windows to provide a complete system for assembly of components and anchorage of window units.
 - 1. Prepare ticket windows for glazing unless preglazing at the factory is indicated.
- B. Framing: Provide snap-in cover for fastening channel..
- C. Glazing Stops: Stops integral with frame extrusion.
- D. Metal Protection: Separate dissimilar metals to protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
- E. Factory-cut openings in glazing for speaking apertures.

2.03 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.04 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.05 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3. Directional Satin Finish: No. 4.

2.06 ACCESSORIES

- A. Transaction Door: Half-round pivoting door, formed from stainless steel with exposed flanges for installation into sill framing.
- B. Speaking Apertures: No-draft stainless steel speaking louver.
 - 1. Shape: Circular.
 - 2. Product: Model 834A manufactured by C. R. Laurence, Co. Inc
- C. Compression-Type Glazing Strips and Weather Stripping: Unless otherwise indicated, provide compressible stripping for glazing and weather stripping, such as molded EPDM or neoprene gaskets complying with ASTM D 2000, Designations 2BC415 to 3BC620; molded PVC gaskets complying with ASTM D 2287; or molded, expanded EPDM or neoprene gaskets complying with ASTM C 509, Grade 4.
- D. Miscellaneous Glazing Materials: Provide material, size, and shape complying with requirements of glass manufacturers and with a proven record of compatibility with surfaces contacted in installation.
 - 1. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.
 - 2. Setting Blocks: Elastomeric material with a Type A Shore durometer hardness of 85, plus or minus 5.
 - 3. Spacers: Elastomeric blocks or continuous extrusions with a Type A Shore durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
 - 4. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- E. Anchors, Clips, and Window Accessories: Stainless steel; hot-dip, zinc-coated steel or iron, complying with ASTM B 633.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- G. Sealants: For sealants required within fabricated ticket windows, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of ticket windows.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of ticket window connections before ticket window installation.
- C. Inspect built-in and cast-in anchor installations, before installing ticket windows, to verify that anchor installations comply with requirements. Prepare inspection reports.
 - 1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
 - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare anchor inspection reports.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing ticket windows to in-place construction. Include threaded fasteners for inserts, security fasteners, and other connectors.
- B. Fasteners: Install ticket windows using fasteners recommended by manufacturer with head style appropriate for installation requirements, strength, and finish of adjacent materials. Provide stainless-steel fasteners in stainless-steel materials.
- C. Sealants: Comply with requirements in Section 07 90 05 "Joint Sealers" for installing sealants, fillers, and gaskets.
 - 1. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction unless otherwise indicated.
 - 2. Seal frame perimeter with sealant to provide weathertight construction unless otherwise indicated.
- D. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.03 ADJUSTING

- A. Remove and replace defective work, including ticket windows that are warped, bowed, or otherwise unacceptable.

3.04 CLEANING AND PROTECTION

- A. Clean surfaces promptly after installation of ticket windows. Take care to avoid damaging the finish. Remove excess glazing and sealant compounds, dirt, and other substances.
- B. Clean glass of preglazed ticket windows promptly after installation.
- C. Provide temporary protection to ensure that ticket windows are without damage at time of Substantial Completion.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry.
 - 2. Section 08 06 10 - Door Schedule.
 - 3. Section 08 06 71 - Door Hardware Schedule.
 - 4. Section 08 11 13 - Hollow Metal Doors and Frames.
 - 5. Section 28 13 00 - Access Control.
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
 - 3. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtin Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
 - 4. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure difference.
 - 5. ASTM E1996 - Standard specification for performance of exterior windows, curtain walls, doors and storm shutters impacted by Windborne Debris in Hurricanes.
 - 6. FEMA 361 2008 - Design and Construction Guidance for Community Safe Rooms.
 - 7. ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters.
 - 8. ICC/IBC - International Building Code.
 - 9. NFPA 70 - National Electrical Code.
 - 10. NFPA 80 - Fire Doors and Windows.
 - 11. NFPA 101 - Life Safety Code.
 - 12. NFPA 105 - Installation of Smoke Door Assemblies.
 - 13. TAS-201-94 - Impact Test Procedures.
 - 14. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
 - 15. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C - Positive Pressure Fire Tests of Door Assemblies

1.02 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Proof of Certification: Provide copy of manufacturer(s) official certification or accreditation document indicating proof of status as a qualified and authorized provider of the primary Integrated Wiegand Access Control Products.
- D. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- E. Informational Submittals:
 - 1. LEED Submittals: Manufacturer's product information and applicable sustainability program credits that are available to contribute towards a LEED rated project certification.
 - a. Credit MR 4.1 and 4.2: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and pre-consumer recycled content by weight for each Product specified under this Section. Use materials with recycled content such that the sum of the post-consumer recycled content plus one-half of the pre-consumer content constitutes an additional 10% beyond MR Credit 4.1 (total of 20% based on cost) of the total values of the material in the project as follows:

- 1) Floor Closers: 63%
 - 2) Pivots: 78%
 - 3) Cylindrical Locks: 58%
 - 4) Mortise Locks: 57%
 - 5) Exit Devices: 54%
 - 6) Door Closers: 51%
 - 7) Overhead Stops: 46%
- b. Low-Emitting Materials EQ 4.2: Provide products that reduce the quantity of indoor air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of installers and occupants; products shall not produce VOC emissions.
2. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- G. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.03 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Integrated Wiegand, Wireless, and IP-Enabled Access Control Products Supplier Qualifications: Integrated access control products and accessories are required to be supplied and installed through current members of the ASSA ABLOY "Authorized Channel Partner" (ACP) and "Certified Integrator" (CI) programs. Suppliers and Installers are to be factory trained, certified, and a direct purchasers of the specified products and be responsible for commissioning and servicing the installed equipment indicated for the Project.

- E. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through current members of the manufacturer's "Power Operator Preferred Installer" program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.
- F. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- G. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
 - 1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
 - 3. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.
 - 4. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
 - a. Test Pressure: Positive pressure labeling.
- H. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- I. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.

- J. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, arrange for manufacturers' representatives to hold a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 3. Review sequence of operation narratives for each unique access controlled opening.
 4. Review and finalize construction schedule and verify availability of materials.
 5. Review the required inspecting, testing, commissioning, and demonstration procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.05 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.06 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Ten years for extra heavy duty cylindrical (bored) locks and latches.
 - 3. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 4. Five years for standard duty cylindrical (bored) locks and latches.
 - 5. Five years for exit hardware.
 - 6. Ten years for manual door closers.
 - 7. Two years for electromechanical door hardware.

1.07 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
 - 1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
 - 2. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.
 - a. Permanent cylinders, cores, and keys to be installed by Owner.

- B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.02 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing hinges unless Hardware Sets indicate heavy weight.
 - c. Tornado Resistant Assemblies: At a minimum, provide heavy weight hinges with stainless steel screws used in accordance with and specified as part of a Severe Storm Shelter Opening meeting ICC 500 and FEMA 361.
 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - 1) Out-swinging exterior doors.
 - 2) Out-swinging access controlled doors.
 5. Acceptable Manufacturers:
 - a. Hager Companies (HA).
 - b. McKinney Products (MK).
 - c. Stanley Hardware (ST).
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90 minute rated door installations and U.L. listed for windstorm components where applicable. Factory cut hinges for door size and provide with removable service power transfer panel where indicated at electrified openings.
1. Acceptable Manufacturers:
 - a. McKinney Products (MK).
 - b. Pemko Manufacturing (PE).
 - c. Stanley Hardware (ST).

2.03 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
1. Acceptable Manufacturers:
 - a. Hager Companies (HA) - ETW-QC (# wires) Option.
 - b. McKinney Products (MK) - QC (# wires) Option.
- B. Electrified Quick Connect Continuous Geared Transfer Hinges: Provide electrified transfer continuous geared hinges with a 12" removable service panel cutout accessible without de-mounting door from the frame. Furnish with Molex™ standardized plug connectors with sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
1. Acceptable Manufacturers:
 - a. McKinney Products (MK) - SER-QC (# wires) Option.
 - b. Pemko Manufacturing (PE) - SER-QC (# wires) Option.
- C. Provide mortar guard enclosure on steel frames installed at masonry openings for each electrical hinge specified.
- D. Electric Door Hardware Cords: Provide electric transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.
1. Acceptable Manufacturers:
 - a. McKinney Products (MK) - Inner Door Cord 3 inches: QC-C003P.
 - b. McKinney Products (MK) - Inner Door Cord 3 foot door: QC-C206P.
 - c. McKinney Products (MK) - Inner Door Cord 4 foot door: QC-C306P.
 - d. McKinney Products (MK) - Inner Door Cord 15 feet: QC-C1500P.
 - e. McKinney Products (MK) - Hinge to Junction Panel 15 feet: QC-C1500P.
 2. Provide one each of the following tools as part of the base bid contract:
 - a. McKinney Products (MK) - Electrical Connecting Kit: 52-3000.
 - b. McKinney Products (MK) - Connector Hand Tool: 52-0439.

2.04 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts and surface bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
1. Acceptable Manufacturers:
 - a. Door Controls International (DC).
 - b. McKinney Architectural Hardware (MK).

- c. Rockwood Manufacturing (RO).
 - d. Trimco (TC).
- B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Coordinators fabricated from steel with nylon-coated strike plates and built-in adjustable safety release.
 - 1. Acceptable Manufacturers:
 - a. Door Controls International (DC).
 - b. McKinney Architectural Hardware (MK).
 - c. Rockwood Manufacturing (RO).
 - d. Trimco (TC).
- C. Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 - 1. Push/Pull Plates: Minimum .050 inch thick, 4-inches wide by 16-inches high, with square corners and beveled edges, secured with exposed screws unless otherwise indicated.
 - 2. Straight Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection from face of door unless otherwise indicated.
 - 3. Offset Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection and offset of 90 degrees unless otherwise indicated.
 - 4. Push Bars: Minimum 1-inch round diameter horizontal push bars with minimum clearance of 2 1/2-inch projection from face of door unless otherwise indicated.
 - 5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 - a. Acceptable Manufacturers:
 - 1) McKinney Architectural Hardware (MK).
 - 2) Rockwood Manufacturing (RO).
 - 3) Trimco (TC).

2.05 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
 - 1. Acceptable Manufacturers:
 - a. Stanley Best (BE).
- C. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
 - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
- D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.
- E. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:
 1. Master Key System: Cylinders are operated by a change key and a master key.
 2. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
 3. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
 4. Existing System: Master key or grand master key locks to Owner's existing system.
 5. Keyed Alike: Key all cylinders to same change key.
- F. Key Quantity: Provide the following minimum number of keys:
 1. Top Master Key: One (1)
 2. Change Keys per Cylinder: Two (2)
 3. Master Keys (per Master Key Group): Two (2)
 4. Grand Master Keys (per Grand Master Key Group): Two (2)
 5. Construction Control Keys (where required): Two (2)
 6. Permanent Control Keys (where required): Two (2)
- G. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".
- H. Key Registration List: Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
- I. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall expansion capacity of 150% of the number of locks required for the project.
 1. Acceptable Manufacturers:
 - a. Lund Equipment (LU).
 - b. Telkee (TK).
- J. Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

2.06 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.
 - 1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ML2000 Series.
 - b. Sargent Manufacturing (SA) - (R)8200 Series.
 - c. Schlage (SC) - L9000 Series.
 - d. Stanley Best (BE) - 47H Series.
- B. Lock Trim Design: As specified in Hardware Sets.
- C. Knurling: Where specified provide knurling or abrasive coating to all levers on doors leading to hazardous areas such as mechanical rooms, boiler and furnace rooms, janitor closets, and as otherwise required by the Illinois Accessibility Code.

2.07 ELECTROMECHANICAL LOCKING DEVICES

- A. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below.
 - 1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.
 - 2. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ML20900 Series.
 - b. Sargent Manufacturing (SA) - 8200 Series.
 - c. Schlage (SC) - L9000 EL/EU/RX Series.
 - d. Stanley Best (BE) - 47HW EL/EU Series.

2.08 AUXILIARY LOCKS

- A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.5, Grade 1, certified small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.
 - 1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DL4100 Series.
 - b. Sargent Manufacturing (SA) - 4870 Series.
 - c. Schlage (SC) - L460 Series.
 - d. Stanley Best (BE) - 48H Series.

2.09 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 4. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 - a. Fire Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions to be used only with exit devices for which they have been tested.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty trim with cold forged escutcheons, beveled edges, and four threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets. Provided free-wheeling type trim where indicated.
 - b. Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Provide and install interior surface and concealed vertical rod exit devices as Less Bottom Rod (LBR) unless otherwise indicated.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness. Painted or aluminum metal rails are not acceptable. Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.
 - 1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
 - c. Von Duprin (VD) - 35A/98/99 XP Series.
 - d. Yale Locks and Hardware (YA) - 7000 Series.
- C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish. Provide keyed removable feature, stabilizers, and mounting brackets as specified in the Hardware Sets. At openings designed for severe wind load conditions due to hurricanes or tornadoes, provide manufacturers approved mullion and accessories to meet applicable state and local windstorm codes.
 - 1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - 700/900 Series.
 - b. Sargent Manufacturing (SA) - 980S Series.
 - c. Von Duprin (VD) - 9954 Series.
 - d. Yale Locks and Hardware (YA) - M200 Series.

2.11 ELECTROMECHANICAL CONVENTIONAL EXIT DEVICES

- A. Electrified Conventional Push Rail Devices (Heavy Duty): Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified below.
 - 1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
 - c. Von Duprin (VD) - 35A/98/99 Series.
 - d. Yale Locks and Hardware (YA) - 7000 Series.
- B. Electrified Options: As indicated in hardware sets, provide electrified exit device options including: electric latch retraction, electric dogging, outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling. Unless otherwise indicated, provide electrified exit devices standard as fail secure.
- C. Hurricane and Tornado Resistance Compliance: Electromechanical conventional exit devices and electrified tube steel removable mullions to be U.L. listed for windstorm components where applicable. Provide the appropriate hurricane or tornado resistant products that have been independent third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

2.12 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
 - 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 - 2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire

- Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1 provisions for door opening force and delayed action closing.
 4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
 - b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
 - c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 5. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units and high impact, non-corrosive plastic covers standard.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC8000 Series.
 - b. Sargent Manufacturing (SA) - 351 Series.
 - c. Norton Door Controls (NO) - 7500 Series.
 - d. Yale Locks and Hardware (YA) - 4400 Series.

2.13 AUTOMATIC DOOR OPERATORS

- A. General: Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.
 1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
- B. Electromechanical Door Operators: Self-contained units powered by permanent magnet DC motor, with closing speed controlled mechanically by gear train, connections for power, activation and safety device wiring, and manual operation including spring closing when power is off.
- C. Electrohydraulic Door Operators: Self-contained low-pressure units with separate cylinders for power and checking, connections for power, activation, and safety device wiring and manual operation including spring closing when power is off.
- D. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.
- E. Standard: Certified ANSI/BHMA A156.19.

1. Performance Requirements:
 - a. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
 - b. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.
- F. Configuration: Surface mounted. Door operators to control single swinging and pair of swinging doors.
- G. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.
 1. On-off switch to control power to be key switch operated.
- H. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.
- I. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
- J. Activation Devices: Provide activation devices in accordance with ANSI/BHMA A156.19 standard, for condition of exposure indicated and for long term, maintenance free operation under normal traffic load operation. Coordinate activation control with electrified hardware and access control interfaces. Activation switches are standard SPST, with optional DPDT availability.
- K. Signage: As required by cited ANSI/BHMA A156.19 standard for the type of operator.
 1. Acceptable Manufacturers:
 - a. Besam Automated Entrance Systems (BE) - SW100 Series.
 - b. LCN Closers (LC) - 4640 Series.
 - c. Norton Door Controls (NO) - 6900 PowerMatic Series.
 - d. Sargent Manufacturing (SA) - MPower CL4000 Series.

2.14 ARCHITECTURAL TRIM

- A. Door Protective Trim
 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 3. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following.
 - a. Stainless Steel: 050-inch thick, with countersunk screw holes (CSK).
 - b. Brass or Bronze: 050-inch thick, with countersunk screw holes (CSK).
 - c. Laminate Plastic or Acrylic: 1/8-inch thick, with countersunk screw holes (CSK).
 4. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.

5. Metal Door Edging: Door protection edging fabricated from a minimum .050-inch thick metal sheet, formed into an angle or "U" cap shapes, surface or mortised mounted onto edge of door. Provide appropriate leg overlap to account for protection plates as required. Height to be as specified in the Hardware Sets.
6. Acceptable Manufacturers:
 - a. McKinney Architectural Hardware (MK).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).

2.15 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Acceptable Manufacturers:
 - a. McKinney Architectural Hardware (MK).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 1. Acceptable Manufacturers:
 - a. Rixson Door Controls (RF).
 - b. Rockwood Manufacturing (RO).
 - c. Sargent Manufacturing (SA).

2.16 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: :Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.

- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Acceptable Manufacturers:
 - 1. McKinney Weatherstripping Products (MW).
 - 2. Pemko Manufacturing (PE).
 - 3. Reese Enterprises, Inc. (RS).

2.17 ELECTRONIC ACCESSORIES

- A. Key Switches: Key switches furnished standard with stainless steel single gang face plate with a 12/24VDC bi-color LED indicator. Integral backing bracket permits integration with any 1 1/4" or 1 1/2" mortise type cylinder. Key switches available as momentary or maintained action and in narrow face plate options.
 - 1. Acceptable Manufacturers:
 - a. Security Door Controls (SD) - 800 Series.
 - b. Securitron Door Controls (SU) - MK Series.
- B. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 1. Acceptable Manufacturers:
 - a. Security Door Controls (SD) - 630 Series.
 - b. Securitron Door Controls (SU) - BPS 12/24 Series.

2.18 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.19 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Antimicrobial Finishes: Where specified, finishes on locksets, latchsets, exit devices and push/pull trim to incorporate an FDA recognized. Silver Ion, antimicrobial coating (MicroShield™) listed for use on equipment as a suppressant to the growth and spread of a broad range of bacteria, algae, fungus, mold and mildew.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.02 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.03 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Integrated Wiegand access control products are required to be installed through current members of the ASSA ABLOY "Certified Integrator" (CI) program.
- D. Power Operator products and accessories are required to be installed through current members of the manufacturer's "Power Operator Preferred Installer" program.
- E. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- F. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- G. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.04 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.05 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.06 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish, and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.07 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.08 DOOR HARDWARE SCHEDULE

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. Refer to Section 080671, Door Hardware Schedule, for hardware sets.

END OF SECTION 087100

SECTION 08 80 00

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Glass.
- C. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 25 00 - Weather Barriers.
- B. Section 07 90 05 - Joint Sealers: Sealant and back-up material.
- C. Section 08 43 13 - Aluminum-Framed Storefronts.

1.03 REFERENCE STANDARDS

- A. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
- B. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- C. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2012.
- D. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 2008.

1.04 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. Samples: Submit two samples 12 x 12 inch in size of glass units.
- D. Samples: Submit 3 inch long bead of glazing sealant, color as selected.
- E. Manufacturer's Certificate: Certify that Type 1 and Type 2 glass meets or exceeds specified requirements.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with FGMA Sealant Manual for glazing installation methods.

1.06 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.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.01 GLAZING TYPES

- A. Type 1 - Sealed Insulating Glass Units: Vision glazing, low-E.
 - 1. Application: Exterior glazing where indicated.
 - 2. Substitutions: Refer to Section 01 60 00 - Product Requirements.
 - a. Other products of the basis of design manufacturer and products of other manufacturers will be considered provided the overall performance is within the specified range(s) and the overall appearance is not significantly different from that of the specified product.
 - b. Architect's decision on substitutions is final.
 - 3. Between-lite space filled with air.
 - 4. Thermal Resistance (U-Value): 0.29 winter/0.28 summer, nominal.
 - 5. Total Solar Heat Gain Coefficient: 0.30, nominal.
 - 6. Total Visible Light Transmittance: 49 percent, minimum.
 - 7. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint and Coating: Guardian CrystalGray with SunGuard SN 68 on #2 surface.
 - 8. Inboard Lite: Annealed float glass, 1/4 inch thick.
 - a. Tint: None (clear).
 - 9. Basis of Design: Guardian Industries Corp: www.sunguardglass.com. Subject to compliance with requirements, provide comparable products by one of the following:
 - a. PPG Industries, Inc.
 - b. AGC Flat Glass North America, Inc.
 - c. Pilkington North America Inc.
- B. Type 2 - Sealed Insulating Glass Units: Safety glazing:
 - 1. Applications: Provide this type of glazing in the following locations:
 - a. Glazed sidelights and panels next to doors.
 - b. Other locations required by applicable federal, state, and local codes and regulations.
 - c. Other locations indicated on the drawings.
 - 2. Type: Same as other vision glazing except use fully tempered float glass for both outboard and inboard lites.
- C. Type 3 - Single Vision Glazing:
 - 1. Applications: All interior glazing unless otherwise indicated.
 - 2. Type: Annealed float glass.
 - 3. Tint: Clear.
 - 4. Thickness: 1/4 inch.
 - 5. Glazing Method: Gasket glazing.
- D. Type 4 - Single Vision Glazing:
 - 1. Applications: As shown and scheduled.
 - 2. Type: Fully tempered float glass.
 - 3. Tint: Clear.
 - 4. Thickness: 1/4 inch.
 - 5. Glazing Method: Gasket glazing.

2.02 EXTERIOR GLAZING ASSEMBLIES

- A. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
 - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
 - 2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.03 GLASS MATERIALS

- A. 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. Fully Tempered Types: ASTM C1048.
 - 3. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.

2.04 SEALED INSULATING GLASS UNITS

- A. Manufacturers:
 - 1. Any of the manufacturers specified for float glass.
 - 2. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- B. Sealed Insulating Glass Units: Types as indicated.
 - 1. Locations: Exterior, except as otherwise indicated.
 - 2. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 - 3. Edge Spacers: Aluminum, mitered and spigoted corners.
 - 4. Edge Seal: Glass to elastomer.
 - 5. Purge interpane space with dry hermetic air.

2.05 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 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. Glazing Tape: Preformed butyl compound; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
 - 1. Manufacturers:
 - a. Pecora Corporation: www.pecora.com.
 - b. Tremco Global Sealants: www.tremcosealants.com.
 - c. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- C. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; black color.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 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.

3.03 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.

3.04 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

END OF SECTION

SECTION 08 91 00

LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Louvers, frames, and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 90 05 - Joint Sealers.
- B. Section 23 31 00 - HVAC Ducts and Casings: Ductwork attachment to louvers.

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2010.
- B. AMCA 511 - Certified Ratings Program for Air Control Devices; Air Movement and Control Association International, Inc.; 2010.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.

1.04 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. 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.
- D. Samples: Submit two samples 2 by 2 inches in size illustrating finish and color of exterior surfaces.
- E. Test Reports: Independent agency reports showing compliance with specified performance criteria.

1.05 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wall Louvers:
 - 1. Airolite Company, LLC: www.airolite.com.
 - 2. American Warming and Ventilating: www.awv.com.

3. Construction Specialties, Inc: www.c-sgroup.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 LOUVERS

- A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified under AMCA 511.
 1. Wind Load Resistance: Design to resist positive and negative wind load as required by code without damage or permanent deformation.
 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 insect screens at intake louvers and bird screens at exhaust louvers.
- B. Stationary Louvers at exterior walls: Horizontal blade, extruded aluminum construction, with intermediate mullions matching frame.
 1. Free Area: 50 percent, minimum.
 2. Blades: Stormproof.
 3. Frame: 4 inches deep, channel profile; corner joints mitered and mechanically fastened, with continuous recessed caulking channel each side.
 4. Metal Thickness: Frame 0.081 inch; blades 0.081 inch.
 5. Finish: Clear anodized; finish welded units after fabrication.

2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M),.
- B. Bird Screen: Interwoven wire mesh of steel, 0.063 inch diameter wire, 1/2 inch open weave, square design.
- C. Insect Screen: 18 x 16 size aluminum mesh.
- D. Polyvinylidene Fluoride Coating: Minimum 70 percent Kynar 500/Hylar 500 resin, three coat finish, complying with AAMA 2604.

2.04 ACCESSORIES

- A. Blank-Off Panels: Aluminum face and back sheets, polyisocyanurate foam core, 1 inch thick, painted black on exterior side; provide where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.
- B. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- C. Fasteners and Anchors: Stainless steel.
- D. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.
- E. Sealant: Type 1, as specified in Section 07 90 05.

PART 3 EXECUTION

3.01 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.
- F. Coordinate with installation of mechanical ductwork.

3.02 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

END OF SECTION

SECTION 09 05 61

COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:
 - 1. Resilient tile and sheet.
 - 2. Carpet tile.
 - 3. Fluid-Applied Flooring.
- C. Preparation of new concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and pH.
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or pH conditions.
 - 1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

1.02 SUBMITTALS

- A. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
 - 1. Moisture and pH limits and test methods.
 - 2. Manufacturer's required bond/compatibility test procedure.
- B. Testing Agency's Report: Include:
 - 1. Description of areas tested; include floor plans and photographs if helpful.
 - 2. Summary of conditions encountered.
 - 3. Moisture and pH test reports.
 - 4. Copies of specified test methods.
 - 5. Recommendations for remediation of unsatisfactory surfaces.
 - 6. Submit report directly to Owner.
 - 7. Submit report not more than two business days after conclusion of testing.
- C. Adhesive Bond and Compatibility Test Report.

1.03 QUALITY ASSURANCE

- A. Moisture and pH testing will be performed by an independent testing agency employed and paid by Owner.
- B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
 - 1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- C. Contractor's Responsibility Relating to Independent Agency Testing:
 - 1. Provide access for and cooperate with testing agency.
 - 2. Confirm date of start of testing at least 10 days prior to actual start.

3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Owner when specified ambient conditions have been achieved and when testing will start.

1.04 FIELD CONDITIONS

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
 1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
 2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
 3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
- B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of pH found, and suitable for adhesion of flooring without further treatment.
 1. Thickness: 1/8 inch, maximum.
 2. If testing agency recommends any particular products, use one of those.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

- A. Perform following operations in the order indicated:
 1. Preliminary cleaning.
 2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
 3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 4. pH tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 5. Specified remediation, if required.
 6. Patching, smoothing, and leveling, as required.
 7. Other preparation specified.

8. Adhesive bond and compatibility test.
 9. Protection.
- B. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
 2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating over entire suspect floor area.
 3. Excessive pH: If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.03 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

3.04 INTERNAL RELATIVE HUMIDITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

- F. Report: Report the information required by the test method.

3.05 pH TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Note: This procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
- C. Use a wide range pH paper, its associated chart, and distilled or deionized water.
- D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the pH paper into the water, remove it, and compare immediately to chart to determine pH reading.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value is over 10.

3.06 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.
- C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- D. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.

3.09 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 1000, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Gypsum wallboard.
- E. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 05 40 00 - BPD - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.

1.03 REFERENCE STANDARDS

- A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002 (Reapproved 2007).
- B. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2011a.
- C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
- D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2011.
- E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 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. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2010a.
- H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2011.
- I. ASTM C1629/C1629 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2006.
- J. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- K. ASTM E72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2010.
- L. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2010.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- D. Test Reports: For all stud framing products that do not comply with ASTM C645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
- E. LEED Submittals:
 - 1. For gypsum wallboard, submit documentation of recycled content and location of manufacture.
 - 2. For steel products, submit documentation of steel mill process, location of mill, and location of manufacture.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board application and finishing.
- B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
 - 1. See PART 3 for finishing requirements.

2.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
 - 2. Marino\Ware: www.marinoware.com.
 - 3. Phillips Manufacturing Company: www.phillipsmfg.com.
- 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/360 at 7.5 psf.
 - 1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
 - 2. Studs: "C" shaped with flat or formed webs 20 gage minimum.
 - 3. Runners: U shaped, sized to match studs.
 - 4. Ceiling Channels: C shaped.
 - 5. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
- D. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and braced with continuous bridging both sides.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. Georgia-Pacific Gypsum: www.gpgypsum.com.
 - 3. Lafarge North America Inc: www.lafargenorthamerica.com.
 - 4. National Gypsum Company: www.nationalgypsum.com.
 - 5. USG Corporation: www.usg.com.
 - 6. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold-resistant board is required at all locations.
 - 3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 - 4. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch.
 - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
- C. Impact-Rated Wallboard: Tested to Level 3 soft-body and hard-body impact in accordance with ASTM C 1629.
 - 1. Application: Up to 8 feet above finish floor in areas scheduled to receive gypsum board.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 3. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
 - 4. Type: Fire-resistance rated Type X, UL or WH listed.
 - 5. Thickness: 5/8 inch
 - 6. Edges: Tapered.
 - 7. Products:
 - a. National Gypsum Company; Gold Bond Hi-Impact Brand XP Wallboard.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
 - 1. Application: Vertical surfaces behind thinset tile, except in wet areas.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 3. Type: Type X, in locations indicated.
 - 4. Type X Thickness: 5/8 inch.
 - 5. Edges: Tapered.
- E. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Ceilings, unless otherwise indicated.
 - 2. Thickness: 5/8 inch.
 - 3. Edges: Tapered.

2.04 ACCESSORIES

- A. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, or rigid plastic, unless otherwise indicated.
 - 1. Types: As detailed or required for finished appearance.
 - 2. Special Shapes: In addition to conventional cornerbead and control joints, provide L-bead at exposed panel edges.

- B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
 - 1. Tape: 2 inch wide, coated glass fiber tape for joints and corners in wet areas.
 - 2. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 - 3. Powder-type vinyl-based joint compound.
- C. High Build Drywall Surfer: 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.
- D. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
- E. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - 1. Level ceiling system to a tolerance of 1/1200.
 - 2. Laterally brace entire suspension system.
 - 3. Install bracing as required at exterior locations to resist wind uplift.
- C. Studs: Space studs as indicated.
 - 1. Extend partition framing to structure in typical conditions, 6 inches above ceiling at perimeter wall conditions and as indicated.
 - 2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

3.03 BOARD INSTALLATION

- A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
- 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.

3.05 JOINT TREATMENT

- A. 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 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
 4. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

END OF SECTION

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Suspended metal grid ceiling system.
- C. Acoustical units.

1.02 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 C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2008.
- C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2011.
- D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.

1.03 ADMINISTRATIVE REQUIREMENTS

- 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. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Samples: Submit two samples 6 x 6 inch in size illustrating material and finish of acoustical units.
- E. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner, and perimeter molding.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. LEED Submittal: Documentation of recycled content and location of manufacture.

1.05 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.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

- A. Manufacturers:
 - 1. Basis of Design: Armstrong World Industries, Inc: www.armstrong.com.
 - 2. CertainTeed Corporation: www.certainteed.com.
 - 3. USG: www.usg.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Acoustical Units - General: ASTM E1264, Class A.
- C. Acoustical Panels Type ACP-1: Ceramic and mineral fiber composite with the following characteristics:
 - 1. Size: 24 x 24 inches.
 - 2. Thickness: 5/8 inches.
 - 3. Composition: Ceramic and mineral fiber composite.
 - 4. NRC Range: 0.55 as specified in ASTM E1264.
 - 5. Ceiling Attenuation Class (CAC): 38, determined as specified in ASTM E1264.
 - 6. Edge: Square.
 - 7. Surface Color: White.
 - 8. Product: Ceramaguard Fine Fissured Perforated, Model # 607 by Armstrong.
 - 9. Suspension System: Exposed grid Type 1.

2.02 SUSPENSION SYSTEM(S)

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. USG: www.usg.com.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Suspension Systems - General: ASTM C635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- C. Exposed Steel Suspension System Type 1: Formed G90 hot-dipped galvanized steel, commercial quality cold rolled; intermediate-duty.
 - 1. Profile: Tee; 15/16 inch wide face.
 - 2. Construction: Double web.
 - 3. Finish: White painted.
 - 4. Product: Prelude Plus XL by Armstrong.

2.03 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. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, 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. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- D. 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.
- E. 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.
- F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- G. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- H. Do not eccentrically load system or induce rotation of runners.
- I. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
 - 2. Overlap and rivet corners.

3.02 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. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.

3.03 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.

END OF SECTION

SECTION 09 65 66

RESILIENT ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Rubber tile flooring, adhesively installed.
- C. Resilient base.
- D. Water-jet cut logo inlay.
- E. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
- B. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.

1.03 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, and layout, colors, logos and equipment locations.
- D. LEED Submittal: Documentation of recycled content and location of manufacture.
- E. Selection Samples: Manufacturer's color charts for flooring materials specified, indicating full range of colors and textures available.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer certified in writing by the flooring manufacturer to be qualified for installation of specified flooring system.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.
- B. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.06 FIELD CONDITIONS

- A. Maintain temperature in spaces to receive adhesively installed resilient flooring within range of 70-95 degrees F for not less than 48 hours before the beginning of installation and for not less than 48 hours after installation has been completed. Subsequently, do not allow temperature in installed spaces to drop below 50 degrees F or to go above 100 degrees F.

PART 2 PRODUCTS

2.01 PREFORMED ATHLETIC FLOORING

- A. Manufacturers:
 - 1. Nora; Norament 992 Granno.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Rubber Tile Flooring: Virgin rubber material formed into square tiles \diamond , laid with adhesive.
 - 1. Thickness: Minimum 3/8 in.
 - 2. Size: Nominal 36 in square.
 - 3. Surface Texture: Lightly textured.
 - 4. Color: As selected from manufacturer's standards.

2.02 ACCESSORIES

- A. Leveling Compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.
- B. Adhesive: Water-resistant type recommended by flooring manufacturer for project conditions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. 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 athletic flooring to substrate.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
 - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- D. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Concrete: Use leveling compound as necessary to achieve substrate flatness of plus or minus 1/8 inch within 10 ft radius.
- B. Remove coatings that are incompatible with flooring adhesives, using methods recommended by flooring manufacturer.
- C. Broom clean areas to receive athletic flooring immediately before beginning installation.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Comply with manufacturer's recommendations and approved shop drawings.
- C. Rubber Tile Flooring:

1. Lay out center lines in spaces to receive tile flooring, based on location of principal walls. Start tile installation from center, and adjust as necessary to avoid tiles less than one-half width at perimeter.
2. Lay tiles square with room axis, matching for color and pattern by selecting from cartons and mixing as recommended by manufacturer.
3. Install water-cut logo floor tile pieces as shown on Drawings.

3.04 CLEANING

- A. Clean flooring using methods recommended by manufacturer.

3.05 PROTECTION

- A. Protect finished athletic flooring from construction traffic to insure that it is without damage upon completion of the work.

END OF SECTION

SECTION 09 67 00

FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Fluid-applied flooring and base.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 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; sizes, patterns and colors available.
- C. Samples: Submit two samples, 6 x 6 inch in size illustrating color and texture for each floor material for each color specified.
 - 1. Provide three different textures for each color.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.
- F. LEED Submittal: Documentation of recycled content and location of manufacture.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum 5 years documented experience.
- B. Applicator Qualifications: Company specializing in performing work of this section with minimum 5 years experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.06 FIELD CONDITIONS

- A. Maintain minimum temperature in storage area of 55 degrees F.
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.
- C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Trowel applied multi-component epoxy urethane flooring systems.
- B. Fluid-Applied Flooring Type PE-1: Urethane, single component, thermosetting, with flake broadcast on base coat..
 - 1. Product: Basis of Design: StonTec TRF manufactured by Stonhard.
 - 2. Thickness: Nom. 1/8 to 3/16 inch.
 - 3. Broadcast flakes with urethane sealer.

2.02 ACCESSORIES

- A. Cant Strips: Molded material compatible with flooring.
- B. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- C. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of materials to sub-floor surfaces.
- C. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.
- D. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - FLOORING

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness indicated.
- C. Finish to smooth level surface.
- D. Cove at vertical surfaces.

3.04 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until cured.

3.05 SCHEDULE

- A. All locations:
 - 1. Type PE-1: Light texture #2.
 - 2. Color: Custom Blend: Vi-Tech-92C

END OF SECTION

SECTION 09 68 13

TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Carpet tile, fully adhered.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Reclamation/Recycling of new carpet tile scrap.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, cleaning, and preparation.

1.03 REFERENCE STANDARDS

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.
- B. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.
- C. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute; Current Edition.

1.04 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; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- D. LEED Report: Submit data documenting VOC content of carpet tile and adhesives; copy of current CRI Approved Products Listing is acceptable.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum three years experience.

1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Carpet Tile Type WOC-1: Tip-sheared loop, manufactured in one color dye lot.
 - 1. Product: Ruffian II manufactured by Mannington.
 - 2. Tile Size: 24 x 24 inch, nominal.
 - 3. Color: See Finish Schedule.

2.02 ACCESSORIES

- A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Edge Strips: Embossed aluminum, Architect to select color.
- C. Adhesives: Acceptable to carpet tile manufacturer, compatible with materials being adhered; maximum VOC of 50 g/L; CRI Green Label certified; in lieu of labeled product, independent test report showing compliance is acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern or as scheduled and shown, with pile direction alternating to next unit, set parallel to building lines.
- F. Fully adhere carpet tile to substrate.
- G. Trim carpet tile neatly at walls and around interruptions.
- H. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 90 00

PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Surfaces to be finished are indicated in this section and on the Drawings.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- C. Section 05 51 00 - Metal Stairs: Shop-primed items.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Master Painters and Decorators Association; 2004.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system (copy of relevant MPI Manual page is acceptable).
- C. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
- D. Samples: Submit one paper "drop" samples, 8-1/2 by 11 inches in size, illustrating colors selected for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.

1.05 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.
- B. Material Safety Data Sheets: At project site maintain file of MSDS sheets for each product used; become familiar with and follow manufacturer's stated application and safety requirements.

1.06 MOCK-UP

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide wall panel, 8 feet long by 10 feet wide, illustrating coating color, texture, and finish.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.09 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Supply 1 gallon of each color; store where directed.
- C. Label each container with color in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer.
- B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
- C. In the event that a single manufacturer cannot provide all specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
- D. Paints: Acceptable manufacturers are limited to the following:
 - 1. Benjamin Moore & Co: www.benjaminmoore.com.
 - 2. Sherwin-Williams: www.sherwin-williams.com.
 - 3. Glidden Professional: www.gliddenprofessional.com.
- E. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS - GENERAL

- A. Volatile Organic Compound (VOC) Content:
 - 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.
 - b. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
 - 1) Opaque, Flat: 50 g/L, maximum.
 - 2) Opaque, Nonflat: 150 g/L, maximum.
 - 3) Opaque, High Gloss: 250 g/L, maximum.
 - 4) Varnishes: 350 g/L, maximum.
 - c. Architectural coatings VOC limits of State in which the project is located.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- B. Paints and Coatings: Provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI Categories, except as otherwise indicated.
 - 1. Provide ready mixed paints and coatings.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.03 PAINT SYSTEMS

- A. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.
- B. Provide colors as directed by Architect.
 - 1. Allow for minimum of five colors for each system, unless otherwise indicated, without additional cost to Owner.
 - 2. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.04 EXTERIOR PAINT SYSTEMS

- A. SYSTEM E-1:
 - 1. Substrate: Structural Steel and Metal Fabrications:
 - 2. Applications include but are not limited to structural steel.
 - 3. Manufacturers and products:
 - a. Sherwin Williams:
 - 1) 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series
 - 2) 2nd Coat: S-W A-100 Exterior Latex Gloss, A8 Series
 - 3) 3rd Coat: S-W A-100 Exterior Latex Gloss, A8 Series
 - b. Benjamin Moore:
 - 1) 1st Coat: Moore PO6 Super Spec HP Alkyd Metal Primer
 - 2) 2nd Coat: 096 MoorGlo Acrylic Semi-Gloss House Paint
 - 3) 3rd Coat: 096 MoorGlo Acrylic Semi-Gloss House Paint
 - c. Glidden Professional:
 - 1) 1st Coat: Devoe Coatings DEVFLEX Direct-to-Metal 4020 primer
 - 2) 2nd Coat: Glidden Professional Fortis 450 6407 topcoat
 - 3) 3rd Coat: Glidden Professional Fortis 450 6407 topcoat

B. SYSTEM E-2:

1. Substrate: Hollow metal door frames:
2. Finish: Gloss.
3. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: DTM Acrylic Primer/Finish, B66W1
 - 2) 2nd Coat: DTM Acrylic Gloss Coating, B66W100
 - 3) 3rd Coat: DTM Acrylic Gloss Coating, B66W100
 - b. Benjamin Moore:
 - 1) 1st Coat: Moorcraft Super Spec DTM Alkyd Satin, Z163
 - 2) 2nd Coat: Moorcraft Super Spec Urethane Gloss Enamel, Z22
 - 3) 3rd Coat: Moorcraft Super Spec Urethane Gloss Enamel, Z22
 - c. Glidden Professional:
 - 1) 1st Coat: DEVGUARD 4360 Low VOC Universal Primer
 - 2) 2nd Coat: DEVGUARD 4309 Rust Preventative Gloss Enamel
 - 3) 3rd Coat: DEVGUARD 4309 Rust Preventative Gloss Enamel

C. SYSTEM E-3:

1. Substrate: Galvanized Metal, Not Chromate Passivated:
2. Applications include but are not limited to railings, lintels and bollards.
3. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: S-W Pro Industrial Pro-Cryl® Primer, B66-310 Series
 - 2) 2nd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series
 - 3) 3rd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series
 - b. Benjamin Moore:
 - 1) 1st Coat: Moore P04 Super Spec HP Acrylic Metal Primer
 - 2) 2nd Coat: Moore N096 MoorGlo Acrylic Semi-Gloss House Paint
 - 3) 3rd Coat: Moore N096 MoorGlo Acrylic Semi-Gloss House Paint
 - c. Glidden Professional:
 - 1) 1st Coat: Devco Coatings DEVFLEX Direct-to-Metal 4020 primer
 - 2) 2nd Coat: Glidden Professional Fortis 450 6407 topcoat
 - 3) 3rd Coat: Glidden Professional Fortis 450 6407 topcoat

2.05 INTERIOR PAINT SYSTEMS

A. SYSTEM I-1:

1. Substrate: Concrete Masonry Units
2. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: S-W PrepRite® Block Filler, B25W25
 - 2) 2nd Coat: S-W ProMar® 200 Latex Semi-Gloss, B20W2200 Series
 - 3) 3rd Coat: S-W ProMar® 200 Latex Semi-Gloss, B20W2200 Series
 - b. Benjamin Moore:
 - 1) 1st Coat: Moore 160 Super Spec Latex Block Filler
 - 2) 2nd Coat: 333 Regal AquaGlo Acrylic Semi-Gloss Enamel
 - 3) 3rd Coat: 333 Regal AquaGlo Acrylic Semi-Gloss Enamel
 - c. Glidden Professional:
 - 1) 1st Coat: Glidden Professional Block Filler 3010 primer
 - 2) 2nd Coat: Glidden Professional Diamond 450 7400 topcoat
 - 3) 3rd Coat: Glidden Professional Diamond 450 7400 topcoat

B. SYSTEM I-2

1. Substrate: Concrete Masonry Units (Epoxy paint, Semi-gloss finish)

2. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: S-W Heavy Duty Block Filler, B42W46
 - 2) 2nd Coat: S-W Pro Industrial HB/ Waterbased Epoxy, B71W111/B71W100 Series
 - 3) 3rd Coat: S-W Pro Industrial HB/ Waterbased Epoxy, B71W111/B71W100 Series
 - b. Benjamin Moore:
 - 1) 1st Coat: Super Spec HP Waterborne Epoxy Block Filler P31
 - 2) 2nd Coat: Super Spec HP Acrylic Epoxy Coating P43
 - 3) 3rd Coat: Super Spec HP Acrylic Epoxy Coating P43
 - c. Glidden Professional:
 - 1) 1st Coat: Tru-Glaze 4015 Block Filler
 - 2) 2nd Coat: Tru-Glaze WB 4426 Water-Based Epoxy
 - 3) 3rd Coat: Tru-Glaze WB 4426 Water-Based Epoxy
- C. SYSTEM I-3
1. Substrate: Structural Steel and Metal Fabrications:
 2. Finish: Semi-Gloss.
 3. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: S-W Pro Industrial Pro-Cryl® Primer, B66-310 Series
 - 2) 2nd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series
 - 3) 3rd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series
 - b. Benjamin Moore:
 - 1) 1st Coat: Moore P04 Super Spec HP Acrylic Metal Primer
 - 2) 2nd Coat: N333 Regal AquaGlo Acrylic Semi-Gloss Enamel
 - 3) 3rd Coat: N333 Regal AquaGlo Acrylic Semi-Gloss Enamel
 - c. Glidden Professional:
 - 1) 1st Coat: Devco Coatings DEVFLEX Direct-to-Metal 4020 primer
 - 2) 2nd Coat: Glidden Professional Diamond 450 7400 topcoat
 - 3) 3rd Coat: Glidden Professional Diamond 450 7400 topcoat
- D. SYSTEM I-4
1. Substrate: Hollow metal door frames:
 2. Finish: Gloss.
 3. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: DTM Acrylic Primer/Finish, B66W1
 - 2) 2nd Coat: DTM Acrylic Gloss Coating, B66W100
 - 3) 3rd Coat: DTM Acrylic Gloss Coating, B66W100
 - b. Benjamin Moore:
 - 1) 1st Coat: Moorcraft Super Spec DTM Alkyd Satin, Z163
 - 2) 2nd Coat: Moorcraft Super Spec Urethane Gloss Enamel, Z22
 - 3) 3rd Coat: Moorcraft Super Spec Urethane Gloss Enamel, Z22
 - c. Glidden Professional:
 - 1) 1st Coat: DEVGUARD 4360 Low VOC Universal Primer
 - 2) 2nd Coat: DEVGUARD 4309 Rust Preventative Gloss Enamel
 - 3) 3rd Coat: DEVGUARD 4309 Rust Preventative Gloss Enamel
- E. SYSTEM I-5
1. Substrate: Galvanized Metal, Not Chromate Passivated:
 2. Applications include but are not limited to railings and exposed ductwork.
 3. Manufacturers and Products:

- a. Sherwin Williams:
 - 1) 1st Coat: S-W Pro Industrial Pro-Cryl® Primer, B66-310 Series
 - 2) 2nd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series
 - 3) 3rd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31W2200 Series
 - b. Benjamin Moore:
 - 1) 1st Coat: Moore P04 Super Spec HP Acrylic Metal Primer
 - 2) 2nd Coat: N333 Regal AquaGlo Acrylic Semi-Gloss Enamel
 - 3) 3rd Coat: N333 Regal AquaGlo Acrylic Semi-Gloss Enamel
 - c. Glidden Professional:
 - 1) 1st Coat: Devoe Coatings DEVFLEX Direct-to-Metal 4020 primer
 - 2) 2nd Coat: Glidden Professional Diamond 450 7400 topcoat
 - 3) 3rd Coat: Glidden Professional Diamond 450 7400 topcoat
- F. SYSTEM I-6
1. Substrate: Gypsum Board (Satin Finish):
 2. Applications include but are not limited to walls, ceilings, soffits, bulkheads, and column covers.
 3. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: S-W PrepRite 200 Int. Latex Primer, B28 Series
 - 2) 2nd Coat: S-W ProMar® 200 Latex Eggshell, B20Series
 - 3) 3rd Coat: S-W ProMar® 200 Latex Semi-Gloss, B31Series
 - b. Benjamin Moore:
 - 1) 1st Coat: Moore P04 Super Spec HP Acrylic Metal Primer
 - 2) 2nd Coat: N319 Regal Acrylic Latex Eggshell Finish Enamel
 - 3) 3rd Coat: N319 Regal Acrylic Latex Eggshell Finish Enamel
 - c. Glidden Professional:
 - 1) 1st Coat: Glidden Professional High Hide 1000 primer
 - 2) 2nd Coat: Glidden Professional Diamond 450 7300 topcoat
 - 3) 3rd Coat: Glidden Professional Diamond 450 7300 topcoat
- G. SYSTEM I-7
1. Substrate: Gypsum Board (Epoxy Finish):
 2. Manufacturers and Products:
 - a. Sherwin Williams:
 - 1) 1st Coat: PrepRite 200 Int Latex Primer
 - 2) 2nd Coat: ProIndustrial Precat. WB Epoxy, S-G, Series K46
 - 3) 3rd Coat: ProIndustrial Precat. WB Epoxy, S-G, Series K46
 - b. Benjamin Moore:
 - 1) 1st Coat: Super Spec HP Waterborne Polyamide Epoxy Metal Primer P42-70
 - 2) 2nd Coat: Super Spec HP Acrylic Epoxy Coating P43
 - 3) 3rd Coat: Super Spec HP Acrylic Epoxy Coating P43
 - c. Glidden Professional:
 - 1) 1st Coat: Glidden Professional High Hide 1000 primer
 - 2) 2nd Coat: Devoe Coatings TRU-GLAZE WB Epoxy 4426 topcoat
 - 3) 3rd Coat: Devoe Coatings TRU-GLAZE WB Epoxy 4426 topcoat
- H. SYSTEM I-8
1. Substrate: Concrete Floor (Sealed):
 2. Manufacturers and Products:
 - a. W. R. Meadows:
 - 1) 1st Coat: CS-309/30 Concrete Curing and Sealing Compound

PART 3 EXECUTION

3.01 SCOPE -- SURFACES TO BE FINISHED

- A. Paint all exposed surfaces except where indicated not to be painted or to remain natural; the term "exposed" includes areas visible through permanent and built-in fixtures when they are in place.
- B. Paint the surfaces described in PART 2, indicated on the Drawings, and as follows:
 - 1. If a surface, material, or item is not specifically mentioned, paint in the same manner as similar surfaces, materials, or items, regardless of whether colors are indicated or not.
 - 2. Paint surfaces behind movable equipment and furnishings the same as similar exposed surfaces.
 - 3. Paint surfaces to be concealed behind permanently installed fixtures, equipment, and furnishings, using primer only, prior to installation of the permanent item.
 - 4. Paint back sides of access panels and removable and hinged covers to match exposed surfaces.
 - 5. Finish top, bottom, and side edges of exterior doors the same as exposed faces.
 - 6. Paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment occurring in finished areas to match background surfaces, unless otherwise indicated.
 - 7. Paint shop-primed mechanical and electrical items occurring in finished areas.
 - 8. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
 - 9. Paint interior surfaces of air ducts and convector and baseboard heating cabinets with flat, nonspecular black paint where visible through registers, grilles, or louvers.
 - 10. Paint dampers exposed behind louvers, grilles, to match face panels.
 - 11. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- C. Do Not Paint or Finish the Following Items:
 - 1. Items fully factory-finished unless specifically noted; factory-primed items are not considered factory-finished.
 - 2. Items indicated to receive other finish.
 - 3. Items indicated to remain naturally finished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Anodized aluminum.
 - 6. Polished and brushed stainless steel items.
 - 7. Brick, precast concrete, integrally colored plaster.
 - 8. Polished and brushed stainless steel, anodized aluminum, bronze, terne, and lead.
 - 9. Acoustical materials.
 - 10. Concealed piping, ductwork, and conduit.

3.02 EXAMINATION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials; report incompatible primer conditions and submit recommended changes for Architect's approval.

- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Plaster and Gypsum Board: 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 - 3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
- E. Measure the pH factor of concrete, masonry, and mortar before starting any finishing process, using the method specified in MPI Architectural Painting Manual.
 - 1. Report results in writing to Architect before starting work.
 - 2. If results of test indicates need for remedial action, provide written description of remedial action. If a different primer or paint systems is required, state the total cost of the change. Do not proceed with remedial action or change without receiving written authorization from Architect.

3.03 PREPARATION

- A. Prepare surfaces as specified in MPI Architectural Painting Specification Manual and as follows for the applicable surface and coating; if multiple preparation treatments are specified, use as many as necessary for best results; where the Manual references external standards for preparation (e.g. SSPC standards), prepare as specified in those standards; comply with coating manufacturer's specific preparation methods or treatments, if any.
- B. Coordinate painting work with cleaning and preparation work so that dust and other contaminants do not fall on newly painted, wet surfaces.
- C. Surface Appurtenances: Prior to preparing surfaces or finishing, remove electrical plates, hardware, light fixtures, light fixture trim, escutcheons, machined surfaces, fittings, and similar items already installed that are not to be painted.
 - 1. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before preparation and finishing.
 - 2. After completing painting in each space or area, reinstall items removed using workers skilled in the trades involved.
- D. Surfaces: Correct defects and clean surfaces which affect work of this section.
- E. Marks: Seal with shellac those which may bleed through surface finishes.
- F. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete, Cement Plaster and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- I. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- J. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

- K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- L. Interior Wood Items to Receive Transparent Finish: Sand wood to obtain a uniform appearance before immediately starting work. Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
- M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.04 APPLICATION

- A. Apply products in accordance with manufacturer's instructions and as specified or recommended by MPI Manual, using the preparation, products, sheens, textures, and colors as indicated.
 - 1. Remove, refinish, or repaint work not complying with requirements.
- B. Do not apply finishes over dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable coating film; do not apply finishes to surfaces that are not dry.
- C. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate; provide total dry film thickness of entire system as recommended by manufacturer.
 - 1. Number of coats and film thickness required are the same regardless of application method.
 - 2. 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.
 - 3. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.
- E. Apply finish to completely cover surfaces with uniform appearance without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.
 - 1. Before applying finish coats, apply a prime coat of material recommended by manufacturer, unless the surface has been prime coated by others; where evidence of suction spots or unsealed areas in first coat appear, recoat primed and sealed surfaces to ensure finish coat with no burn through or other defects due to insufficient sealing.
 - 2. Apply first coat to surface that has been cleaned, pretreated, or otherwise prepared as soon as practical after preparation and before subsequent surface deterioration.
 - 3. Do not apply succeeding coats until the previous coat has cured as recommended by manufacturer.
 - 4. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat will not cause the undercoat to lift or lose adhesion.
 - 5. If manufacturer's instructions recommend sanding to produce a smooth, even surface, sand between coats.
 - 6. Before applying next coat vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

7. Pigmented (Opaque) Finishes: Provide smooth, opaque surface of uniform finish, color, appearance, and coverage.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.
- B. Owner will provide field inspection.

3.06 CLEANING AND PROTECTION

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from site.
- C. Protect other work, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting as approved by Architect.
- D. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
- E. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in MPI Manual.

END OF SECTION

SECTION 10 11 01

VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Markerboards and Tackboards.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. ASTM A424 - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.

1.04 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.
- D. Samples: Submit two samples 2 by 2 inch in size illustrating materials and finish, color and texture of markerboard, tackboard, tackboard surfacing, and trim.
- E. Maintenance Data: Include data on regular cleaning, stain removal.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Visual Display Boards:
 - 1. Claridge Products and Equipment, Inc: www.claridgeproducts.com.
 - 2. Polyvision Corporation (Nelson Adams): www.polyvision.com.
 - 3. Aarco Products, Inc..
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 VISUAL DISPLAY BOARDS

- A. Markerboards: Porcelain enamel on steel, laminated to core.
 - 1. Color: White.
 - 2. Metal Face Sheet Thickness: 0.024 inch (24 gage).
 - 3. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
 - 4. Backing: Aluminum foil, laminated to core.
 - 5. Size: As indicated on drawings.
 - 6. Frame: Extruded aluminum, with concealed fasteners.
 - 7. Frame Finish: Anodized, natural.
 - 8. Accessories: Provide chalk tray.
- B. Tackboards: Fine-grained, homogeneous natural cork.
 - 1. Cork Thickness: 1/8 inch.
 - 2. Backing: Fiberboard, 3/8 inch thick, laminated to tack surface.
 - 3. Size: As indicated on drawings.
 - 4. Frame: Same type and finish as for chalkboard.
- C. Combination Units and Units Made of More Than One Panel: Factory-assembled markerboards, and tackboards in a single frame, of materials specified above.

2.03 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.
- C. Foil Backing: Aluminum foil sheet, 0.005 inch thick.
- D. Adhesives: Type used by manufacturer.

2.04 ACCESSORIES

- A. Cleaning Instruction Plate: Provide instructions for chalkboard cleaning on a metal plate fastened to perimeter frame near chalkrail.
- B. Chalk Tray: Aluminum, manufacturer's standard profile one piece full length of chalkboard, molded ends; concealed fasteners, same finish as frame.
- C. Mounting Brackets: Concealed.

PART 3 EXECUTION

3.01 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.

3.02 INSTALLATION

- A. Install boards in accordance with manufacturer's instructions.
- B. Secure units level and plumb.

3.03 CLEANING

- A. Clean board surfaces in accordance with manufacturer's instructions.

3.04 SCHEDULE

- A. Type A1: typical markerboard/tackboard combination, sizes as shown.
- B. Type B1: Tackboard, sizes as shown.

END OF SECTION

SECTION 10 21 13.19

SOLID COMPOSITE TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Solid composite toilet compartments.
- C. Urinal screens.

1.02 RELATED REQUIREMENTS

- A. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls.

1.05 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. Samples: Submit two samples of partition panels, ____x____ inch in size illustrating panel finish, color, and sheen.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Toilet Compartments:
 - 1. Basis of Design: Bobrick; Product 1090 Sierra series.
 - 2. Substitutions: Section 01 60 00 - Product Requirements.

2.02 COMPONENTS

- A. Toilet Compartments: Solid molded composite panels, doors, and pilasters, floor-mounted headrail-braced.
- B. Door and Panel Dimensions:
 - 1. Door and Stile Thickness: 3/4 inch.
 - 2. Door Width: 24 inch.
 - 3. Door Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Panel Thickness: 1/2 inch.
 - 5. Height: 58 inch.
 - 6. Thickness of Pilasters: 1 inch.

2.03 ACCESSORIES

- A. Pilaster Shoes: Formed ASTM A666, Type 304 stainless steel with satin finish, 3 in high, concealing floor fastenings.
- 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: Polished stainless steel.
- D. Wall Brackets: Continuous type, polished stainless steel.
- E. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- F. Hardware: Polished stainless steel:
 - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 - 2. Door Latch: Slide type with exterior emergency access feature.
 - 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.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 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.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.04 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.

END OF SECTION

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Accessories for toilet rooms, showers, and utility rooms.
- C. Grab bars.

1.02 RELATED REQUIREMENTS

- A. Section 10 21 13.19 - Solid Composite Toilet Compartments.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.
- B. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004 (Reapproved 2010).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Products listed are made by Bobrick and Bradley Corporation.
- B. Other Acceptable Manufacturers:
 - 1. A & J Washroom Accessories Inc: www.ajwashroom.com.
 - 2. American Specialties, Inc: www.americanspecialties.com.
 - 3. Bradley Corporation: www.bradleycorp.com.
 - 4. Substitutions: Section 01 60 00 - Product Requirements.
- C. All items of each type to be made by the same manufacturer.

2.02 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
- B. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

2.03 TOILET ROOM ACCESSORIES

- A. Toilet Paper Dispenser: Jumbo Roll Dispenser
 - 1. Provided by Owner, installed by Contractor.
 - 2. Product: Kimberly-Clark Model No. 09608.
- B. Not Used
- C. Paper Towel Dispenser: Jumbo Roll Dispenser
 - 1. Provided by Owner, installed by Contractor.
 - 2. Product: Kimberly-Clark Model No. 09996
- D. Electric Hand Dryer:
 - 1. Manufacturers:
 - a. American Dryer, Inc; ExtremeAir GXT: www.americandryer.com.
 - b. Excel Dryer; Product Xlerator: www.exceldryer.com.
 - c. World Dryer Corporation; Product SMARTdri: www.worlddryer.com.
 - 2. Substitutions: Section 01 60 00 - Product Requirements.
- E. Waste Receptacle: Recessed and Semi-Recessed, stainless steel, seamless lower door for access to container, reinforced panel full height of door, continuously welded bottom pan and seamless exposed flanges.
 - 1. Liner: Removable, heavy-duty vinyl liner, attached at a minimum of 4 points with stainless steel grommets and hooks.
 - 2. Minimum capacity: 12 gallons.
 - 3. E-1 (Recessed) Product: B-346 manufactured by Bradley.
 - 4. E-2 (Semi-Recessed) Product: B-346-10 manufactured by Bradley.
- F. Soap Dispenser: Soap lather dispenser, wall-mounted, surface, with black ABS cover.
 - 1. Provided by Owner, installed by Contractor.
 - 2. Product: Kimberly-Clark Model No. 92148
- G. Mirrors: Stainless steel framed, 6 mm thick laminated glass mirror.
 - 1. Series B- 290 manufactured by Bobrick.
 - 2. Size: shown on Drawings.
 - 3. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
 - 4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
- H. Grab Bars: Stainless steel, 1-1/2 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
 - 1. Length and configuration: As indicated on drawings.
 - 2. Product: B-6806 Series manufactured by Bobrick.
- I. Not Used
- J. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
 - 1. Product: B-254 manufactured by Bobrick.
- K. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 - 1. Style: Horizontal.
 - 2. Material: Stainless steel shell with polyethylene body.
 - 3. Mounting: Surface.

4. Manufacturers:
 - a. Bradley Corporation: www.bradleycorp.com.
 - b. Koala Kare Products: www.koalabear.com.
 - c. Substitutions: See Section 01600 - Product Requirements.
- L. Shower Curtain Rod: Stainless steel tube, 1-1/4 inch outside diameter, 0.05 inch wall thickness, satin-finished, with 2-9/16 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.
 1. Product: B-6047 manufactured by Bobrick.
- M. Shower Curtain:
 1. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
 2. Shower curtain hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
 3. Product: 204-2 & 204-1 manufactured by Bobrick.
- N. Not Used
- O. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, recessed, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
 1. Product: B-4390 manufactured by Bobrick.
- P. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
 1. Product: B-7671 manufactured by Bobrick.
- Q. 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. Hooks: 4, 0.06 inch stainless steel rag hooks under shelf.
 2. Mop/broom holders: 3 spring-loaded rubber cam holders under shelf.
 3. Length: 34 inches.
 4. Product: B-239 x 34 manufactured by Bobrick.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- 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

3.04 SCHEDULE

- A. Toilet Paper Dispenser: Double Jumbo Roll; Provide as shown.

- B. Not Used
- C. Paper Towel Dispenser: Provide one for each sink in the following locations:
 - 1. Consession Stands
- D. Electric Hand Dryer: Provide as shown in toilet rooms.
- E. Waste Receptacle: Provide as shown in toilet rooms.
- F. Soap Dispenser: Provide as shown in toilet rooms.
- G. Mirrors: As shown in toilet rooms.
- H. Grab Bars: 1-1/2 inch diameter. Provide as shown in toilet rooms.
- I. Not Used
- J. Sanitary Napkin Disposal Unit: Provide as shown in toilet rooms.
- K. Diaper Changing Station: Provide as shown in toilet rooms.
- L. Shower Curtain Rod: Provide as shown in locker room showers.
- M. Shower Curtain: Provide as shown in locker room showers.
- N. Not Used
- O. Wall-Mounted Soap Dish: Provide as shown in locker room showers.
- P. Robe Hook: Provide as shown in locker room showers.
- Q. Combination Utility Shelf/Mop and Broom Holder: Provide as shown in custodial closets.

END OF SECTION

SECTION 10 44 00

FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Fire extinguishers.
- C. Fire extinguisher cabinets.
- D. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
- B. Section 04 20 00 - Unit Masonry BPD: Roughed-in wall openings.
- C. Section 09 90 00 - Painting and Coating: Field paint finish.

1.03 REFERENCE STANDARDS

- A. NFPA 10 - Standard for Portable Fire Extinguishers; 2010.
- B. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions.
- C. Product Data: Provide extinguisher operational features, color and finish, and anchorage details.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

1.05 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguishers:
 - 1. JL Industries, Inc.
 - 2. Larsen's Manufacturing Co.
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. JL Industries, Inc: www.jlindustries.com.
 - 2. Larsen's Manufacturing Co: www.larsensmfg.com.

3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 1. Provide extinguishers labeled by UL for the purpose specified and indicated.
- B. Wet Chemical Type Fire Extinguishers: Stainless steel tank, pressurized, with low "pH" potassium acetate and potassium citrate solution including hose and nozzle.
 1. Class: K.
 2. Size: 2.5 gallon.
 3. Finish: Stainless steel.
- C. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
 1. Class: A:B:C.
 2. Size: 10 pound.
 3. Finish: Baked polyester powder coat, red color.

2.03 FIRE EXTINGUISHER CABINETS

- A. Metal: Formed primed steel sheet; 0.036 inch thick base metal.
- B. Cabinet Configuration: Semi-recessed type.
 1. Sized to accommodate accessories.
 2. Exterior nominal dimensions of ____ inch wide x ____ inch high x ____ inch deep.
 3. Trim: Flat, 3/8 inch wide face.
- C. Door: 12 gage steel door, reinforced for flatness and rigidity; lock with key access. 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.
- E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
- F. Finish of Cabinet Exterior Trim and Door: Primed for field paint finish.
- G. Finish of Cabinet Interior: White enamel.

2.04 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings, 48 inches from finished floor to the top of the cabinet.
- C. Secure rigidly in place.
- D. Place extinguishers in cabinets.

3.03 SCHEDULES

- A. Corridors: Water Type 2A, 2 1/2 gallon (11 L) capacity, polished chrome finish, placed in 12 inch (300 mm) wide x 30 inch (760 mm) high x 10 inch (250 mm) deep recessed polished stainless steel cabinet; locate 2 per floor.
- B. Corridors: Dry Chemical Typs, 10 pound, placed in recessed field painted cabinet, as shown.
- C. Kitchen and Culinary Arts Classroom: Wet Chemical Type, Class K, 2-1/2 gallon capacity, mounted on wall bracket, location as directed, one per room.

END OF SECTION

SECTION 10 51 00

LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Mobile and fixed locker units with hinged doors.
- C. Metal tops and filler panels.
- D. Locker benches.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete base construction.
- B. Section 06 20 00 - Finish Carpentry: Finish top and end panels.

1.03 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; 2011.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on locker types, sizes and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect locker finish and adjacent surfaces from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Team Lockers:
 - 1. Art Metal Products: www.artmetalproducts.com.
 - 2. Lyon Workspace Products: www.lyonworkspace.com.
 - 3. Penco Products, Inc: www.pencoproducts.com.
 - 4. Republic Storage Systems Co: www.republicstorage.com.
 - 5. WEC Manufacturing, Inc.
 - 6. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Baseball Lockers, (mobile and fixed):
 - 1. Mid-Minnesota Wire (GearGrid Product Line), 670 SW 15th Street, Forest Lake, MN 55025. Toll-free 888-643-6694. Phone 651-464-4468. Fax 651-464-4780. Web site www.geargrid.com. Email sales@geargrid.com.

2.02 MATERIALS

- A. Sheet Steel: ASTM A653/A653M SS Grade 33/230, with G60/Z180 coating, stretcher leveled; to the following minimum thicknesses:

1. Body and Shelf: 24 gage, 0.024 inch.
 2. Door Outer Face: 16 gage.
 3. Door Frame: 16 gage, 0.060 inch.
 4. Hinges: 14 gage, 0.075 inch.
 5. Base: 20 gage, 0.036 inch.
 6. Sloping Top: 20 gage, 0.036 inch.
 7. Trim: 20 gage, 0.036 inch.
- B. Accessories For Each Locker: Two single prong wall hooks, coat hanger bar.
- C. Locker Benches: Stationary type; bench top of laminated birch species wood, stained, sealed and varnished; pedestals of chrome steel, 18 inches high.

2.03 LOCKER UNITS - TYPE 1 & TYPE 2 (Team Lockers)

- A. Width: 24 inches.
- B. Depth: 18 inches.
- C. Height: 72 inches.
- D. Configuration: single tier.
- E. Mounting: Free standing and surface mounted.
- F. Base: Fabricate for concrete base.
1. Base Height: 4 inch.
- G. Locking: Equipped for padlock hasps.
- H. Ventilation Method: Expanded metal door panel.
- I. Class: Conventional.
- J. Locker Body: Formed and flanged; with steel stiffener ribs; electric spot welded.
- K. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
- L. Doors: Hollow channel edge construction, 1-3/16 inch thick; welded construction, channel reinforced top and bottom with intermediate stiffener ribs, grind and finish edges smooth.
- M. Hinges: Two for doors under 42 inches high; three for doors over 42 inches high; weld securely to locker body and door.
- N. Locking device supplied by Owner.
- O. Number Plates: Provide rectangular shaped aluminum plates. Form numbers 3/4 inch high of block font style with ADA designation, in contrasting color.
- P. Form recess for operating handle and locking device.
- Q. Finish edges smooth without burrs.
- R. Fabricate metal tops, ends and closure pieces.
- S. Provide end panels and filler strips.

2.04 LOCKER UNITS TYPE 3 (Baseball Mobile Units)

- A. Basis of Design: Model: GEARGRID Mobile Units:
1. GEARGRID 6-pack unit having three openings each side back to back.
 2. 20" 6-pack unit overall dimensions: 83" high x 63" wide x 40" deep.

- B. Locker Sizes:
 - 1. Standard 20" Opening: Overall dimension-79" high x 21.25" wide x 20" deep.
 - 2. Clear Opening Width: 18.75"
- C. Construction: Units shall be welded at all applicable joints. Forming of metal shall be completed by standard cold-forming operations. Use of fasteners will only be required to allow for knock-down shipping, securing units to mounting surface and on applicable accessories.
- D. Vertical Dividers:
 - 1. Outer Frames: 1.25" O.D. x 16 gauge wall thickness ASTM A513 steel tubing.
 - 2. Inner Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
- E. Back Panel:
 - 1. Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
- F. Shelves: (1) Top, (1) Bottom. .25" diameter ASTM 510 cold drawn steel wire resistance welded and cold formed. Top shelf includes a 20 gauge steel bracket to accept a 2" x 16" name placard.
- G. Apparel Hooks: (3) per opening. .25" diameter ASTM 510 cold drawn steel wire resistance welded and cold formed.
- H. Base Assembly: Base frame shall be manufactured from 1.25" x 11 gauge wall thickness ASTM A513 square steel tubing.
 - 1. Each unit to be supplied with four (4) casters per unit. Casters to have a 250 lbs. capacity per each caster.
 - 2. Each caster is a swivel model with brake.
- I. Accessories:
 - 1. Door:
 - a. Frame: 1.25" O.D. x 16 gauge wall thickness ASTM A513 steel tubing.
 - b. Inner Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
 - c. Top Cover: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
 - d. Hinge: Single pin welded style with brass pivot bushing.
 - e. Placard Channel: 20 gauge steel to accept a 2" x 12" name placard.
 - f. Latch/Hasp: Self-latching with padlock hasp. Lock by owner.

2.05 LOCKER UNITS TYPE 4 (Baseball Wall Mounted)

- A. Basis of Design: Model: GEARGRID Wall Mounted Storage System.
- B. Locker Sizes:
 - 1. Standard 20" Opening: Overall dimension-79" high x 21.25" wide x 20" deep.
 - 2. Clear Opening Width: 18.75"
- C. Construction: Units shall be welded at all applicable joints. Forming of metal shall be completed by standard cold-forming operations. Use of fasteners will only be required to allow for knock-down shipping, securing units to mounting surface and on applicable accessories.
- D. Vertical Dividers:
 - 1. Outer Frames: 1.25" O.D. x 16 gauge wall thickness ASTM A513 steel tubing.

2. Inner Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
- E. Back Panel:
 1. Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
- F. Shelves: (1) Top, (1) Bottom. .25" diameter ASTM 510 cold drawn steel wire resistance welded and cold formed. Top shelf includes a 20 gauge steel bracket to accept a 2" x 16" name placard.
- G. Apparel Hooks: (3) per opening. .25" diameter ASTM 510 cold drawn steel wire resistance welded and cold formed.
- H. Mounting Brackets: 11 GA Steel
 1. Provide wall and floor mounting brackets.
 2. Finish: Match locker frame.
- I. Accessories:
 1. Door:
 - a. Frame: 1.25" O.D. x 16 gauge wall thickness ASTM A513 steel tubing.
 - b. Inner Grid: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
 - c. Top Cover: .25" diameter ASTM 510 cold drawn steel wire resistance welded to a 3" square pattern.
 - d. Hinge: Single pin welded style with brass pivot bushing.
 - e. Placard Channel: 20 gauge steel to accept a 2" x 12" name placard.
 - f. Latch/Hasp: Self-latching with padlock hasp. Lock by owner.

2.06 FINISHING

- A. Standard Finish: Components to be cleaned using a phosphatized bath, clear water rinse and electro-statically coated with a durable TGIC powder coating.
- B. Paint locker units as follows:
 1. Locker Types 1, 2, 3, and 4: Custom color: "Dover Blue"

2.07 BENCHES

- A. Standard Bench: Select hardwood seat with clear lacquer finish, 9.5 inches wide by 1.25 inch thick with two heavy duty steel tube legs with flanges top and bottom, anchored to the floor.
 1. Length as shown.
- B. ADA Bench: 42 inch long select hardwood seat with clear lacquer finish, 20 inches wide by 1.25 inch thick with four heavy duty steel tube legs with flanges top and bottom, anchored to the floor.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared bases are in correct position and configuration.
- B. Verify bases are properly sized.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

- B. Install lockers plumb and square.
- C. Place and secure on prepared base.
- D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.
- E. Bolt adjoining locker units together to provide rigid installation.
- F. Install end panels, filler panels, and sloped tops.
- G. Install accessories.
- H. Replace components that do not operate smoothly.

3.03 CLEANING

- A. Clean locker interiors and exterior surfaces.

END OF SECTION

SECTION 11 40 00

FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Provide all material, labor, equipment and services required to execute and complete all items of work relating to the food service equipment, both existing and new, all as required to make the resulting facility a fully functional and reliable operating unit in accordance with this Specification. All food service equipment shall be furnished as specified, delivered prepaid, unloaded and uncrated, assembled with all components and accessories connected within the equipment, set-in-place in proper location as indicated on the drawings, leveled and fastened to the wall, ceiling or floor as required, left ready for final utility connections by the General Contractor. The work shall include:
 - 1. To prevent extended warehousing of all food service equipment, no pre-ordering of equipment is permitted; schedule ordering of the equipment so that warehousing of the equipment shall not be required for longer than 60 days prior to delivery to the site for installation.
 - 2. All food service equipment shall have a manufacturer extended warranty covering parts and labor for a period of two years which shall take effect only after acceptance and beneficial use by the owner. All labor shall be performed by a factory authorized and qualified representative.
 - 3. A "complete and thorough" demonstration and start-up for each item of equipment must be conducted by a qualified manufacturer representative to the Owner's food service and maintenance personnel in the use, sanitation and maintenance of the equipment.
- C. Furnishing scheduled items of custom fabricated food service equipment, as specified, utilizing a food service equipment fabricator listed with the National Sanitation Foundation (NSF) for custom equipment fabrication.
- D. Delivery of food service equipment in factory fabricated containers designed to protect equipment and finish until final installation. Delivery of food service equipment shall be coordinated with the construction schedule as developed by the General Contractor. If necessary, delivery of the food service equipment shall be by means other than common carrier to expedite delivery and to maintain project schedule.
- E. Warehousing of the food service equipment in a bonded warehouse and redelivery of the food service equipment from the storage facility to the project site, or arrangement for secured storage at the project site as coordinated with the Owner to assure availability of the food service equipment to maintain project schedule.

- F. Field installation of the food service equipment, including buy-out equipment at the project site including on-site receiving and unloading, uncrating from packing containers, conveyance of the food service equipment from the receiving area to the installation location, erection and assembly of the food service equipment, including field welding and polishing of sub-assemblies and installation of fixtures and components, and setting-in-place in final location left ready for final utility connection by the General Contractor.
- G. Removal and disposal of all packing material.
- H. All costs for special tools, crane rental or usage costs or rigging as may be required for delivery or installation of the food service equipment as specified.
- I. Furnish materials and install copper insulated refrigeration lines from compressor location to evaporator coils, expansion valves, etc., for all refrigeration units and ice makers specified with remote or refrigeration systems other than self-contained.
- J. All work is to be performed by skilled labor utilizing the proper trades having respective jurisdiction thereto. All work shall be performed at hours required to maintain consistent work schedules with all other trades as coordinated by the General Contractor without additional cost to the Owner.
- K. Preparation of dimensioned utility rough-in floor plans coordinated with the Contract Documents and site conditions and the food service equipment manufacturers' utility connection points, for all food service equipment as specified.
- L. Assist the General Contractor in the preparation of "chalk-line" mark-up of utility rough-in locations on the building floor at the job site.
- M. Take complete financial responsibility for any and all additional expenses that may be borne by the Owner resulting from incomplete or inaccurate rough-in drawings or instructions for the final rough-in dimensioning at the job site.
- N. Provide complete manufacturers' and fabricator shop drawings of all related items of food service equipment.
- O. Provide competent on-site supervision for the coordination of work with the General Contractor and to assist and supervise the erection, assembly, and installation of the food service equipment, this shall include any moving, shifting, or disassembly of the food service equipment as required to enable the General Contractor to perform its work free of obstruction.
- P. Attend all job conferences and meetings as required by the Owner.
- Q. Maintaining coordination and control over the form, fit, function, and utility requirements of all food service equipment, from placement of purchase orders through Final Acceptance by the Owner.
- R. Provide competent on-site final testing, demonstration and instruction in the use and service of all items of food service equipment to the Owner in the form of a qualified manufacture's representative for each item of required food service equipment.
- S. Providing the Owner with access to the custom equipment fabricator's shop for inspection of construction and materials used at any time during the progress of fabrication.
- T. Field verification of all measurements at the project site prior to the fabrication of custom fabricated and buy-out equipment and correct any deviation from the dimensions

indicated on any plans, shop drawing, etc. which may affect the final form or fit of any item of food service equipment as a result of final building conditions and actual field dimensions.

- U. All food service equipment shall conform to field verified dimensions and to the finished building conditions with edges scribed and sealed to wall surfaces, fitting to and around building obstructions, etc. All joints, seams, or surfaces shall be fully sealed with General Electric or equivalent clear silicone sealer.
- V. Field verification of delivery access into and through the building to the final equipment location, including access and clearance through hallways, doorways, elevators (cab size and weight restrictions), etc. furnish food service equipment in sections or sub-assemblies as required for access.
- W. Keeping the premise free from accumulation of waste material and rubbish caused by his work. At the completion of each workday all waste material and rubbish must be removed and all areas swept broom clean.
- X. Physical damage to equipment, building, or previous work completed or in the process of completion shall be repaired or replaced.
- Y. Furnish as part of and affixed to the food service equipment, accessories, components and fixtures furnished standard with the equipment as specified or listed as an option and shall include the following:
 - 1. PLUMBING ACCESSORIES: Pop-up, lever or basket type waste outlets, tailpieces, standing or connected overflows, faucets and spray units, vacuum breakers, shut-off and control valves, fittings, etc.
 - 2. STEAM AND GAS ACCESSORIES: Steam supply valves, thermostats, pressure reducing and regulating valves, shut-off and control valves, temperature and pressure gauges, copper steam coils or injector assemblies, traps, fittings, etc.
 - 3. ELECTRICAL ACCESSORIES: Terminal blocks, conduit, wiring, signal and pilot lamps, on-off and control switches, control panels, magnetic contactor assemblies, heating elements, junction boxes, outlet boxes and receptacles, cord and plug sets, etc.
 - 4. REFRIGERATION ACCESSORIES: Copper insulated refrigeration tubing, valves, fittings, hangers, high and low pressure control switches, solenoid valves, evaporator coils, expansion valves, condensing units, condensate evaporators, etc.
- Z. All built-in accessories, components and fixtures shall be factory installed at the time of fabrication and shall comply with all applicable codes, regulations, etc.
- AA. All electrical wiring, plumbing lines, gas lines (except exposed threaded pipe gas manifolds at cooking appliances), steam lines, refrigeration lines, etc. shall be concealed in the floor, walls or above the finished ceiling in an acceptable manner and in compliance with all applicable codes, etc. Where it is impractical to run lines within the floor, walls or above the finished ceiling, lines shall be enclosed in a stainless steel (or alternate "smooth and cleanable" Owner approved material with appropriate access for service or replacement. In situations of an island arrangement or where equipment is not situated with access to a wall surface, lines must be installed in the floor in an approved manner including in-ground conduit for refrigeration and beverage lines. In no case shall any lines be "exposed".

1.02 WORK BY THE ELECTRICAL CONTRACTOR

- A. Rough-in utility connections including proper voltage, phase and amperage required to satisfactorily operate all items of food service equipment.

- B. Final connection of the food service equipment from the rough-in location to the connection point on all food service equipment and necessary connection points.
- C. Furnish materials and install all interconnecting wiring as required for the food service equipment, this shall include inter-wiring of control panels furnished as a part of a fixture or appliance, on-off switches for light fixtures furnished as a part of a fixture or appliance, inter-wiring of control devices to motors furnished as a part of a fixture or appliance, time clock circuits for freezers from remote condensing unit to evaporator coil, heated pressure relief ports in walk-in freezer, electrical receptacles furnished as a part of a fixture or appliance, light fixtures in exhaust hoods and walk-in refrigeration to on-off switches and conduit junction boxes, inter-wiring of food waste disposer from control device to disposer motor, etc. all as required to complete the installation of the food service equipment.
- D. Furnishing materials and installation of all interconnecting wiring as required for the food service exhaust ventilation and fire suppression systems; this shall include wiring of electrically operated gas supply shut-off valves for fire suppression systems, fire suppression system wiring to building fire alarm, heat detector electrical detection device to automatically start exhaust fans, supply and exhaust fans and control devices including on-off switches located in kitchen, light fixtures, etc.
- E. All electrical components for the exhaust and supply ventilation system (including condensate hoods and pant leg vent systems) including, electrical disconnects, starters, exhaust fan on-off switch with indicator lights located in kitchen, supply fan controller with indicator lights located in kitchen, etc.
- F. Furnish materials and install heat tracing tape to all condensate lines within walk-in freezer.
- G. Furnishing and installation of all accessories, components and fixtures other than those specified as part of the food service equipment, to include but not be limited to, electrical circuit breakers or fuses, electrical receptacles, disconnect switches, on-off switches or other fittings and appurtenances that are required to connect the food service equipment in accordance with manufacturers instructions and result in proper operation.
- H. Utility disconnection and termination of discontinued services of existing food service equipment to be terminated or relocated, and modification or preparation of utility services for existing food service equipment to be relocated at the new location.
- I. Furnishing and installing electrical plug and cord sets where indicated.
- J. Electrical contactors or shunt-trip circuit breakers to interrupt electrical power to all electrically operated food service cooking appliances.
- K. In-floor, flush mounted, waterproof electrical receptacles of type and capacity to match plug and cord sets for all mobile food service counter equipment.
- L. Ceiling mounted, retractable drop cords to accommodate food service equipment in an island arrangement, of the type and capacity to match plug and cord sets of the food service appliances.

1.03 WORK BY THE PLUMBING CONTRACTOR

- A. Rough-in utility connections including gas, steam, hot and cold water, and floor receptors and drains in proper sizes, pressures and quantities required to satisfactorily operate all items of food service equipment.
- B. Final connection of the food service equipment from the rough-in location to the

connection point on all food service equipment and necessary outlets.

- C. Furnish materials and wrap and insulate with foam pipe insulation the heat tracing tape on all condensate lines within a freezer environment.
- D. Furnish materials and install all interconnecting plumbing as required for the food service equipment, this shall include faucets, drains, drains with connected overflow, shut-off valves, vacuum breakers, flow or pressure control valves, gauges, bleeder tubes, piping from disposer control device to disposer cone and disposer body inlets, piping for steam operated equipment from boiler take-off valve at steam generator to steam inlet connection at appliance, etc. all as required to complete the installation of the food service equipment.
- E. Furnish materials and install interconnecting chrome plated exposed piping for hose reel and hose bibs including installation of check valves and vacuum breaker in supply line; this shall include chrome plated bleeder outlet if required by local health department regulations or local plumbing codes.
- F. Furnishing and installation of all accessories, components and fixtures other than those specified as part of the food service equipment, to include but not be limited to stop cocks, traps, pipe, shut-off valves, pressure reducing valves or other fittings and appurtenances that are required to connect the food service equipment in accordance with manufacturers instructions and result in proper operation.
- G. Furnishing and installing chrome plated indirect waste outlet piping for food service equipment, from the waste outlet connection on the food service equipment to the building waste receptacle (floor sink, etc.).
- H. Flushing and sanitizing of lines before making final connections to the food service equipment.

1.04 WORK BY THE MECHANICAL CONTRACTOR

- A. Supply and exhaust ventilation for indoor refrigeration condensing units based on 750 cfm for each air cooled compressor horsepower and 250 cfm for each water cooled compressor horsepower.

1.05 WORK BY THE GENERAL CONTRACTOR

- A. Masonry bases, floor curbs, structural pads, floor depressions, roof curbs, flues and fireproof duct shafts or enclosures.
- B. Installation of floor pans in floor depression with floor pans set flush and finished watertight around entire perimeter at juncture with floor surface.
- C. Conduit for refrigeration lines (PVC if embedded in concrete or smooth aluminum if exposed) with 24" radius sweep bends including sleeves any through walls, floors and ceilings.

1.06 BIDDING INSTRUCTIONS AND QUALIFICATION OF BIDDER

- A. Items of food service equipment described in this specification are considered the basis of design of the base bid and must be bid accordingly without exception. Any substituted item proposed as part of this bid must be submitted two weeks prior to the due date of the bid for "pre-approval" and must meet the conditions of the base bid; this shall include all materials and material finishes, fabrication methods, electrical, plumbing, and mechanical components, electrical control devices, hardware, accessories, and options, exactly as specified without exception. Submission of "pre-approved" substituted items of equipment must be submitted as a part of the base bid, including any add or deduct

price to the base bid. A determination as to the acceptability of the substituted item will be the responsibility of the owner or his designated representative. It will be the full and complete responsibility of the food service equipment contractor to pay any and all costs incurred in adapting any substituted item to the mechanical, electrical, exhaust ventilation, or structural systems of the building, or any other cost increase incurred as a result of engineering changes to the mechanical, electrical, exhaust ventilation, architectural, structural, or food service drawings. Should any item be determined not to be an acceptable substitution to the base bid, it shall be the responsibility of the food service equipment contractor to remove and replace the substituted item with the base bid item, as specified, at no additional cost to the owner. Failure to follow this instruction will disqualify the bid. The contract is to be awarded as follows:

1. The competence and responsibility of the bidder.
 2. An itemized cost breakdown of each scheduled item of food service equipment is required, as specified, in order that the owner may, at his option, delete any item or supply any portion thereof, or increase the quantity of any item without affecting the cost quoted for the remaining items. "Pre-approved" substituted items must be submitted as an add or deduct alternate in addition to the base bid.
 3. The owner is not obligated to accept the lowest or any other bid. The award of the contract and choice of the food service equipment contractor shall be at the Owner's discretion.
- B. Each bidder shall be responsible to visit the project site of the proposed work and fully acquaint himself with conditions as they exist.
- C. Each bidder is responsible to attend any pre-bid meeting as required by the owner.
- D. Each bidder shall be responsible to examine and review the contract document drawings and specifications. Should the bidder find during examination of the drawings and specifications any discrepancies, omissions, ambiguities, or conflicts in or among the contract documents or shall be in doubt as to their meaning, the owner shall be notified no later than four working days prior to bid opening for clarification.
- E. The failure or omission by any bidder to receive or examine any form, instrument or document or to visit the project site shall in no way relieve him from obligation with respect to his bid. No claims for any extras will be allowed due to unintentional errors, conflicts, or omissions in the contract documents drawings or specifications.

1.07 SUBMITTALS

- A. Product Data: For each buy-out item of food service equipment indicated. Include manufacturer's model number and accessories and requirements for access and maintenance clearances, water and drainage, power or fuel, and service connections including roughing-in dimensions.
- B. Shop Drawings: For food service equipment not manufactured as standard production and catalog items by manufacturers. Shop drawings shall include the following information:
1. Dimensioned rough-in plans scaled at 1/4"=1'-0", accurately locating connection points and indicating utility data for all mechanical, electrical, and supply and exhaust ventilation requirements, including all items of new and existing food service equipment to be reused.
 2. Dimensioned plans scaled at 1/2"=1'-0", accurately locating and indicating the finished size of masonry bases, floor depressions in structural slabs, stub walls, curbs, and finished openings for pass-thru equipment in walls, etc.
 3. Dimensioned plans and detailed drawings of all custom fabricated food service equipment scaled at 3/4"-1'-0" for plan and elevation views, and 1-1/2"=1'-0" for

sectional views.

- C. Copies of original maintenance and repair manuals, including a list of all authorized service agencies responsible for each item of food service equipment.

1.08 QUALITY ASSURANCE

- A. Manufacturer's qualifications shall include a firm that has regularly engaged in the manufacturing of food service equipment of the same type, capacity, performance, and size as specified, and whose products have been in similar service for not less than five years.
- B. Custom fabricator qualifications for custom food service equipment shall include a skilled sheet metal shop with a minimum of five years experience in custom sheet metal food service equipment fabrication of similar type as specified. All custom food service equipment shall be fabricated at the same shop.
- C. Installer's qualifications shall include a firm with at least three years of successful installation experience on projects with a similar scope to that as required for this project.
- D. Food service equipment dealers qualifications shall include a firm which is regularly engaged in the purchasing of food service equipment as is a manufacturer authorized agent of the specified equipment for not less than five years. The dealer shall also employ a full time project management staff to oversee the purchase of the equipment in compliance with the specifications, coordinate the form and fit of the equipment to the project site conditions, attend all project meetings, coordinate shop drawing review, coordinate installation with the trades, coordinate factory training, and address all issues as they relate to the satisfactory completion of the facility in compliance with the specifications and related documentation.
- E. Codes and Standards: All food service equipment furnished and installed under this specification shall be manufactured in strict compliance with the following publications or the current or revised related publication as well as all state, national, and local codes and agencies having jurisdiction over same:
 - 1. National Electrical Manufacturer Association NEMA
 - a. ICS-77 Industrial Controls and Systems
 - 2. National Fire Protection Association NFPA
 - a. 12.1 General Information and Requirements
 - b. 17.4 Local Application System
 - c. 17.13 Water Sprinkler Systems
 - 3. National Sanitation Foundation NSF
 - a. 11-76 Food Service Equipment
 - b. 4-73 Commercial Cooking and Warming Equipment
 - c. C-2-72 Special Equipment and/or Devices
 - 4. Underwriters Laboratories UL
 - a. 57-78 Electric Lighting Fixtures
 - b. 197-78 Commercial Electric Cooking Appliances
 - c. 300 Fire Extinguishing Systems
 - 5. International Mechanical Code 2006 (IMC)
 - 6. 2009 Federal Regulations for Refrigeration
- F. All food service equipment shall be manufactured in strict compliance with standards as set forth by the National Sanitation Foundation (NSF), including fabrication of custom built equipment and shall be listed with same and shall bear their seal. Any item of food service equipment lacking the NSF seal will be rejected.

- G. All electrically operated food service equipment shall be constructed in strict compliance with standards as set forth by the Underwriters Laboratories (UL) and shall utilize approved components and assemblies and shall bear the label thereof.
- H. Custom fabricated food service equipment shall be constructed to the standards as set forth by the National Association of Food Equipment Manufacturers (NAFEM).
- I. All refrigeration equipment and all pressurized vessels shall be constructed, approved, inspected, registered and stamped and installed in strict compliance with the American Society of Mechanical Engineers (ASME), state and local codes for Unfired Pressure Vessels, and all other agencies having jurisdiction thereof.
- J. Product Options: Drawings indicate food service equipment based on the specific products indicated. Other manufacturers' equipment with equivalent size and performance characteristics may be considered.
- K. Pre installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Review methods and procedures related to food service equipment including, but not limited to, the following:
 - 1. Review access requirements for equipment delivery.
 - 2. Review equipment storage and security requirements.
 - 3. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
 - 4. Review structural loading limitations.
 - 5. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver food service equipment as factory-assembled units with protective crating and covering.
- B. Store food service equipment in original protective crating and covering and in a dry location.

1.10 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of food service equipment installation areas by field measurements before equipment fabrication and indicate measurements on Shop Drawings and Coordination Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.11 COORDINATION

- A. Coordinate equipment layout and installation with other work, including light fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate location and requirements of service-utility connections.
- C. Coordinate size, location, and requirements of concrete bases, positive slopes to drains, floor depressions, and insulated floors. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete".
- D. Coordinate installation of roof curbs, equipment supports, and roof penetrations, as specified in Division 7 Section "Roof Accessories".

1.12 WARRANTIES

- A. General Warranty: The special 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. All buy-out food service equipment herein specified shall have all parts and labor warranted, in writing, from the date of Final Acceptance by the Owner against defective parts, materials, workmanship, and design for a period of time as stated within the manufacturers standard published warranty, but no less than two years.
- C. All custom fabricated food service equipment shall be warranted as stated above except for a period of two years.
- D. Refrigeration equipment shall include start-up and two year parts and labor warranty on the entire refrigeration system and manufacturers five year parts warranty on hermetic and semi-hermetic sealed compressors.

PART 2 - PRODUCTS

2.01 MATERIALS AND WORKMANSHIP

- A. Stainless steel shall be type 302 or type 304 extra low carbon non-magnetic austenitic 18% chrome, 8% nickel alloy steel. Gauges shall be U.S. Standard of Thickness set forth below:

GAUGE	THICKNESS	GAUGE	THICKNESS
10	.1346	16	.0598
11	.1196	18	.0478
12	.1046	20	.0359
14	.0747	22	.0299

- B. All sheets shall be of maximum length to permit fabrication from one sheet. All thickness must meet the above gauge thickness within tolerances set forth by the ANSI after polishing. Finished sheets exceeding these tolerances shall be rejected as not meeting this Specification.
- C. Galvanealled steel shall be ARMCO steel or an approved grade of copper bearing steel. All exterior galvanealled parts, exposed members of framework, and wrought steel pipe shall be properly primed, degreased and finished with two coats of synthetic aluminum bronze.
- D. Structural steel members used for framing, consisting of angles, bands, bars, and channels, shall be ductile in quality, free of hard spots, runs, checks, cracks, and other surface defects, and shall be smooth galvanized by the hot dip process with all surplus removed, free of runs, blisters, excess splatter, and uncoated spots or patches.
- E. White metal shall consist of corrosion resistant metal containing not less than 21% nickel. All castings shall be rough ground, polished and buffed to a bright luster and shall be free from pit marks, runs, checks, burrs, and other imperfections.
- F. Stainless steel pipe and tubing shall be seamless or welded of gauge specified and of true roundness. Seamless tubing shall be thoroughly and correctly annealed and ground smooth. Welded tubing shall be thoroughly heat treated and properly quenched to eliminate carbide precipitation, drawn true to size and roundness and polished to match stainless steel sheets.
- G. Welding shall be of the electric submerged or concealed arc type, heliarc wherever practical. Where welding rods are required, they shall be of the same composition as materials to be joined, coated with a non-carbonaceous flux.

- H. Plywood and Lumber: Close grain exterior grade mahogany or birch plywood.
- I. Sealant: ASTM C 920; Type S, Grade NS, Class 25, Use NT. Provide elastomeric sealant NSF certified for end-use application indicated. Provide sealant that, when cured and washed, meets requirements of Food and Drug Administration's 21 CFR, Section 177.2600 for use in areas that come in contact with food.
 - 1. Color: As selected by Architect from manufacturer's full range of colors.
 - 2. Backer Rod: Closed-cell polyethylene, in diameter larger than joint width.
- J. Plastic: Except for plastic laminate, provide plastic materials and components complying with NSF 51.
- K. Sound Dampening: NSF-certified, nonabsorbent, hard drying, and sound-deadening coating. Provide coating compounded for permanent adhesion to metal in 1/8-inch (3-mm) thickness that does not chip, flake, or blister.
- L. Gaskets: NSF certified for end-use application indicated; of resilient rubber, neoprene, or PVC that is nontoxic, stable, odorless, nonabsorbent, and unaffected by exposure to foods and cleaning compounds.

2.02 ACCESSORIES

- A. Cabinet Hardware: Provide NSF-certified, stainless steel hardware for equipment items as indicated.
- B. Casters: NSF-certified, standard-duty, stainless-steel, swivel stem casters with 5-inch (125-mm) diameter wheels, polyurethane tires with 1-inch (25-mm) tread width, and 300-lb (90-kg) load capacity per caster. Provide brakes on 2 casters per unit.

2.03 FABRICATION

- A. All welds shall be strong and ductile, nonporous, free of pits and cracks. Parts, which are to be welded, shall be homogeneous, of a like color and finish to adjoining material. Excess metal and carbide precipitation shall be ground off, finished smooth and polished. Unexposed welds shall be pacified to prevent attrition. Brazed or soldered joints are unacceptable. Where galvanizing has been damaged due to the welding or grinding process, these areas shall be galvawelded to replace finish.
- B. All exposed surfaces of the food service equipment shall be free from bolts, screws, and rivet fastenings. Wherever bolts are required, they shall be of similar composition and finish as the metal to which they are applied.
- C. Wherever practical, all food service equipment and fixtures shall be factory or shop fabricated of one-piece construction, shipped to the project site as one unit, completely assembled.
- D. Items of food service equipment or fixtures too large to enter or transverse the building to the installation location in one assembly shall be constructed in sections and shall be furnished with field joints. Where field joints are necessary, all adjoining exposed surfaces shall be field welded at the project site as specified above for welding. Where conditions make welded field joints impractical, each sub-assembly shall be fabricated with off-set draw angles welded to the underside of each adjoining top surface and drawn together to a "hairline" seam with 1/4"-20 stainless steel bolts with lock washers and chrome plated acorn nuts. Bolted field joints will be permitted only where specifically shown on Drawings or specified for a particular item.
- E. Wherever shear edges occur they shall be free of burrs, fins, or irregular projections and shall be finished to prevent cutting or laceration when the hand is drawn over such shear edges. Brake bends shall be free of undue and where such bends do mar the uniform

surface appearance of the material, such marks shall be removed by suitable grinding, polishing, and finishing. In no case where miters or bullnose corners occur is overlapping materials acceptable.

2.04 GENERAL FABRICATION STANDARDS

A. TOPS

1. Tops shall be fabricated of 14 gauge stainless steel, unless otherwise specified. All edges shall be bullnose or formed as specified with all joints butt-edged and electrically welded ground smooth and polished so no evidence of welding will appear. Soldered corners to achieve round corner construction will not be accepted.
2. Tops adjacent to walls, columns, or other equipment shall be turned up integrally into a backsplash as specified. All interior corners shall be coved on a 3/4" radius, both horizontally and vertically, forming spherical corners. Ends of backsplashes shall be fully enclosed to the low point of the top edge, fully welded, ground smooth and polished.

B. SUPPORT FRAMING

1. Around the entire perimeter on the underside of all tops and set back 1" from the down-turned edge shall be a fully welded frame assembly fabricated of 1-1/2" x 1-1/2" x 1/8" galvanized angle iron, or material as specified. Provide intermediate cross bracing fabricated of the same material as the angle framing and fully weld to perimeter frame on centers not to exceed 24". Tack weld the entire frame assembly to the underside of the top surface.

C. SINKS

1. Sinks shall be fabricated of 14 gauge stainless steel with all interior corners coved on a 3/4" radius, both horizontally and vertically, forming spherical corners.
2. Exposed edges of sink shall be finished with a 1-1/2" diameter, 180 degree rolled edge, rear and sides adjacent to adjoining surfaces shall have a backsplash turned up 10" high at a 90 degree angle on a 3/4" radius, and turned back 2-1/2" on a 45 degree angle, then down 1/2" at 90 degrees along back.
3. Multiple sink compartments shall be divided with double wall, 14 gauge stainless steel partitions, 1" wide, rounded to a 3/4" radius on top and all corners. Finish bottom, back and front with 14 gauge stainless steel to form one continuous sink with no overlapping joints or open spaces between sink compartments.
4. Integral drainboards shall be constructed of 14 gauge stainless steel. The front portion shall continue the 1-1/2" diameter, 180 degree rolled rim of the sink bowl on a continuous level horizontal plane. The surface of the drainboard shall be pitched from 2-1/2" at the end away from the sink to 3" at the sink bowl. Sink and drainboard backsplash shall be continuous and level on the horizontal plane. All interior corners, both vertical and horizontal shall be coved on a 3/4" radius. Drainboards shall be reinforced with 1" x 4" x 1", 12 gauge stainless steel "hat" channels, extending front to rear, tack welded to underside of drainboard, for weld anchoring leg gussets.
5. Provide cross rails extending front to rear between legs, cross rails shall not extend along rear at sink to prevent interference with plumbing.
6. Built-in sink compartments shall be fabricated as an integral part of fixture with sink fully welded with adjacent top, weld ground smooth and polished.

D. PAINTING

1. Galvanized steel shall be cleaned and degreased with mineral spirits, primed with a minimum of two coats of primer, and spray finished with a minimum of two coats of gray epoxy enamel paint.

2.05 STAINLESS STEEL FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
 - 1. Remove or blend tool and die marks and stretch lines into finish.
 - 2. Grind and polish surfaces to produce uniform, directional textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
 - 3. Concealed Surfaces: Minimum of 80 grit finish.
 - 4. Exposed Surfaces: No. 4 finish (bright, directional polish), of 180 grit.
 - 5. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 6. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, service-utility connections and other conditions affecting installation and performance of food service equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine roughing-in for piping, mechanical and electrical systems to verify actual locations of connections before installation.

3.02 INSTALLATION

- A. Set each item of fixed food service equipment securely in place, level and adjust to correct height. Anchor to supporting surface where required for sustained operation and use without shifting or dislocation. Provide concealed anchoring where possible. Adjust work surfaces to a level tolerance of 1/16" maximum offset and slope drainage surfaces at 1/16" per foot.
- B. Complete field assembly of field joints by welding or bolting utilizing the method as indicated with the fixture. Grind all field welds smooth and polish. Set and trim all gaskets to be installed as part of field assembly.
- C. Treat enclosed spaces that are inaccessible after food service equipment installation by covering all horizontal surfaces with powdered borax at a rate of 4 ounces per square foot.
- D. Provide closure trim pieces fabricated of 16 gauge stainless steel or of material and finish as specified, trim shall be one piece constructions furnished to seal both horizontal and vertical junctures and openings where the conditions given below occur:
- E. Food service equipment is installed into wall openings. Trim shall apply to both sides of wall opening with all corners fully welded, ground smooth and polished.
 - 1. Two or more items of food service equipment are butted together.
 - 2. Food service equipment is installed against wall, columns, other equipment, etc. resulting in a gap or juncture exceeding 1/4" in width.
 - 3. An open gap of any size between the juncture or joint between adjoining items of food service equipment, wall or column surfaces, etc. which might result in the penetration or collection of grease or vermin.

- F. Provide cut-outs and openings in food service equipment as required to extend plumbing, electric, steam or gas lines through the food service equipment either for interconnection of utility lines or final connection.
- G. Seal around each item of food service equipment with sealant for gaps or spaces less than 1/4" in width and with stainless steel trim for gaps or spaces exceeding 1/4" in width. Closure strips shall conform to the shape and size of the surfaces or juncture to be sealed and shall be neatly scribed for a tight fit.

3.03 PROTECTION AND CLEANING

- A. Provide final protection and maintain conditions in a manner acceptable to Owner, Manufacturer and Installer that ensure food service equipment is without damage or deterioration at the time of Substantial Completion.
- B. After completion of the food service equipment installation and completion of other major work in the food service area remove protective coverings and clean and sanitize all food service equipment both internally and externally. Restore exposed and semi-exposed finished to remove abrasions or other surface damage polish exposed metal surfaces and touch-up painted surfaces. Replace work which cannot be successfully restored.

3.04 COMMISSIONING

- A. Delay start-up of the food service equipment until utility services have been installed, completed, and tested, balanced, and adjusted for pressure, voltage, etc. and until water and steam lines have been treated and cleaned for sanitation. Before start-up of the food service equipment lubricate in accordance with manufacturers instructions.
 - 1. Coordinate food service equipment start-up with service-utility testing, balancing and adjustments. Do not operate steam lines before they have been cleaned and sanitized.
 - 2. Remove protective coverings and clean and sanitize equipment both inside and out and re-lamp equipment with integral lighting. Where applicable, comply with manufacturer's written cleaning instructions.
- B. Provide on-site demonstration and formal technical training by the manufacturer's technical representative for each item of food service equipment as required to instruct the Owner and its personnel in the safe operation and sanitation and maintenance of the food service equipment.
- C. Test each item of food service equipment for proper operation.
 - 1. Repair or replace equipment that is defective in operation including units that operate below required capacity or that operate with excessive noise or vibration.
 - 2. Test refrigeration equipment's ability to maintain specified operating temperature under heavy-use conditions. Repair or replace equipment that does not maintain specified operating temperature.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 4. Test motors and rotating equipment for proper rotation and lubricate moving parts according to manufacturer's written instructions.
 - 5. Test water, drain, gas, steam, oil, refrigerant and liquid-carrying components for leaks. Repair or replace leaking components.
 - 6. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing and preventive maintenance for each food service equipment item.

7. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Contract Closeout".
8. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data".
9. Schedule training with Owner through Construction Manager with at least seven days advance notice.

3.05 SCHEDULE OF EQUIPMENT

- A. Equipment Schedule: Refer to all Contract Documents pertaining to the food service areas. Equipment itemized along with brands and model numbers and salient features establish the standard for construction, operation and engineering criteria.
- B. Equipment indicated below is intended to establish the standard of quality of the food service equipment. Alternate products by other manufacturers may be considered if equivalent in design, performance, durability and function.
- C. As a condition of this specification, the Food Service Equipment Contractor is required to participate in the review and approval of all contract documents (rough-in drawings, manufacturer's shop drawings, brochure booklets, etc.) at the office of the Food Service Consultant (1001 Baltimore Pike, Lower Level, Springfield, PA. 19064). Upon completion of each review process, the Food Service Equipment Contractor will distribute all documents in a timely manner as directed by the General Contractor.

Item No: 1

Quantity: 2
Description: Prep Table with Double Sink
Mfg: Advance Tabco
Model No: DL-30-72, TA-61 (sink on right)

Supplemental Information:

14 gauge stainless steel top, Type 304, with no-drip edge, 10 inch backsplash, satin finish, sound deadened. Stainless steel sinks integrally welded to top, (16"x20"x8") and (16"x20"x4"). Stainless steel perforated drain basket at shallow sink.

18 gauge stainless steel shelf, Type 430, satin finish, cast aluminum clamps to secure shelf to legs.

Legs: 1-5/8 inch diameter, tubular stainless steel with 1 inch adjustable stainless steel bullet feet.

Item No: 2

Quantity: 1
Description: Prep Table with Double Sink
Mfg: Advance Tabco
Model No: DL-30-72, TA-61 (44" length)

Supplemental Information:

14 gauge stainless steel top, Type 304, with no-drip edge, 10 inch backsplash, satin finish, sound deadened. Stainless steel sinks integrally welded to top, (16"x20"x8") and (16"x20"x4"). Stainless steel perforated drain basket at shallow sink.

18 gauge stainless steel shelf, Type 430, satin finish, cast aluminum clamps to secure shelf to legs.

Legs: 1-5/8 inch diameter, tubular stainless steel with 1 inch adjustable stainless steel bullet feet.

Item No: 3

Quantity: 3
Description: Wall Mounted Hand Sinks
Mfg: Advance Tabco
Model No: 7-PS-60
Options:

14" wide x 10" front-to-back x 5" deep bowl, 20 gauge stainless steel construction with 4" O.C. splash-mounted gooseneck faucet with aerator, basket drain, wall bracket.

Heavy gauge type 304 series stainless steel.

Offset galvanized wall mounting bracket.

Fittings are chrome plated brass.

Supplemental Information:

Furnish stainless steel mounting hardware of proper type for wall construction and to sustain weight while in use.

General contractor shall provide wall blocking as required for mounting.

Item No: 4

Quantity: 6
Description: Double Door Reach In Refrigerators
Mfg: Continental Refrigerator
Model No: 2RE-SS

Options:

6 ea. Self-Contained refrigeration, 1/3 hp, standard

Standard warranty: 1 year parts and labor; 5 year compressor

Stainless steel case back including rear grill & concealed drain

Model 45249CP Thermometer Digital Reading, externally mounted

Model 45247CP Alarm, high/low battery backup (°F)

5" Casters, standard

6 Shelves, epoxy coated, plated steel w/clips.

Item No: 5

Quantity: 1
Mfg: Scotsman
Model No: C1448SA-3

Options: 1 ea 3 year parts & labor warranties

5 year parts & labor warranties on Evaporator

5 year parts on compressor and condenser

Model KVS Prodigy™ Vari-Smart™ Ice Level Control

Model KSBU Prodigy SmartBoard

Model B530S Ice Bin, w/top-hinged front-opening door

Model KLP8S Leg Kit, 6", stainless steel

Model KHOLDER Ice Scoop Holder

Supplemental Information:

Plumbing contractor shall install ice machine filter system in water supply line and furnish and install interconnecting piping between water filter and ice machine water inlet.

Item No: 6

Quantity: 3
Description: Stainless steel service counter.
Mfg: Custom Fabricated

Supplemental Information:

Two curved, one straight (alternate), 16 gauge stainless steel countertop with 4" integral backsplash.

Fabricate as shown on drawings with galvanized steel angle support.
Extend counter under coiling counter OH doors at service windows.

END OF SECTION 114000

SECTION 11 68 20

OUTDOOR ATHLETIC EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Provide all equipment and materials, and do all work necessary to furnish and install the Outdoor Athletic Equipment, as indicated on the drawings and as specified herein.

1.02 RELATED WORK

- A. Examine Contract Documents for requirements that affect work of this section. Other specification sections that directly relate to work of this Section include, but are not limited to:
 - 1. Division 31 00 00 - Earthwork; Excavation and Backfill and establishment of subgrade elevations.
 - 2. Section 32 12 16 - Asphalt Concrete Pavement
 - 3. Section 32 18 23 - Synthetic Track Surfacing
 - 4. Section 32 18 25 - Synthetic Field Surfacing
 - 5. Section 03 30 00 - Cast-in-Place Concrete; Concrete foundations and bases for goals.

1.03 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 1. U.S. Tennis Court and Track Builders Association
 - 2. National Federation of State High School Associations (NFSHSA)
 - 3. National Collegiate Athletic Association (NCAA)
 - 4. International Amateur Athletic Foundation (I.A.A.F.)
 - 5. Manufacturers Data and Recommended Installation Requirements.

1.04 SUBMITTALS

- A. Manufacturers Product Data
 - 1. Provide manufacturer's product literature, technical specifications and other data prior to actual field installation work for Architect or Owner's Representative review.
- B. Shop Drawings
 - 1. Provide drawings of manufacturers recommended installation and foundation requirements prior to actual field installation work for Architect or Owner's Representative review.

1.05 QUALITY ASSURANCE

- A. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Materials delivered to the site shall be examined for concealed damage or defects in shipping. Any defects shall be noted and reported to the Owner's Representative.

- B. Replacements, if necessary, shall be immediately re-ordered, so as to minimize any conflict with the construction schedule.
- C. Sound materials shall be stored above the ground under protective cover or indoors so as to provide proper protection.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. See drawings for sizes and locations.
- B. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment; comply with requirements of contract documents.
- C. Hardware: Heavy duty steel hardware, as recommended by manufacturer.
- D. Electrical Wiring and Components: Comply with NFPA 70; provide UL-listed equipment.
- E. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.02 MANUFACTURERS

- A. Outdoor Athletic Equipment Manufacturers:
 - 1. ACO Polymer Products, Inc.
P.O. Box 245
Chardon, OH 44024; (800) 543-4764
 - 2. Aluminum Athletic Equipment Co. (AAE);
1000 Enterprise Drive,
Royersford, PA 19468; (800) 523-5471.
 - 3. Daktronics
201 Daktronics Dr.
Brookings, SD 57006-5128; (800) 325-8766
 - 4. Edwards Sports Products Ltd,
Units 8-9 Hounsell Building, North Mills,
Bridport, Dorset, DT6 3BE, Tel: 01308 424111; Email: sales@edsports.co.uk
 - 5. Nevco, Inc.
301 East Harris Avenue
Greenville, IL 62246-2151; (800) 851-4040.
 - 6. Sportsfield Specialties Inc.
P.O. Box 231, 41155 State Highway 10
Delhi, NY 13753; (888) 975-3343; www.sportsfieldspecialties.com
 - 7. Tomark Sports, Inc.
P.O. Box 1088
Corona, CA 92878
- B. Manufacturers and product selections named in the following articles are provided to establish the minimum standard. Subject to compliance with the stated attributes of the Basis of Design, products of manufacturers listed above, or other manufacturers, may be submitted as a request for substitution. Refer to Section 01 60 00 - Product Requirements.

2.03 COMBINATION FOOTBALL/SOCCER SYSTEM:

- A. BASE: SG4980HS GoalPak® as manufactured by Sportsfield Specialties Inc. (Basis of Design).

B. COMPONENTS:

1. Football Goal Post(s):
 - a. Gooseneck support fabricated of 6.0 inch Schedule 40 aluminum pipe (6.625 inch OD), 5.0 ft radius, 8.0 ft. offset.
 - b. Crossbar fabricated of 6.0 inch Schedule 40 aluminum pipe (6.625 inch OD).
 - 1) Length: 23 ft. 4 in.
 - 2) With internal rotating sleeve for upright adjustment.
 - c. Uprights fabricated of extruded 6061 T6 aluminum tube (4.0 inch OD) with rigid wire loop at upper end
 - 1) Length: 20.0 ft.
 - d. Powder Coat Finish: Yellow or White
 - e. Installation package consisting of the following components:
 - 1) Ground sleeve: 8.0 inch hot-dipped galvanized Schedule 40 steel pipe, 5 ft. long.
 - 2) Access frame: SG2SGP fabricated of .125 inch aluminum, 22.25 inch square, 6.0 inch high, with eight anchor bolts.
 - 3) Filler plugs fabricated of 0.5 inch pressure treated plywood and .1875 inch (3/16") aluminum.
 - f. Accessories:
 - 1) Directional wind flags.
 - 2) Touch-up paint (powder coat specific).
 - 3) Stainless steel assembly bolts, and nuts.
2. Square Post Soccer Goal(s):
 - a. Crossbar fabricated of 6061 T6 extruded aluminum tube, 4.0 inch square x 0.188 inch thick, having the following attributes:
 - 1) Length: 24.0 ft.
 - 2) Radiused Outside Corners
 - 3) 7 Ga. Steel Crossbar Attachment Brackets
 - 4) Powder Coated White
 - 5) End Frame fabricated of 6061 T6 extruded aluminum tube having the following attributes:
 - (a) Corner Upright Posts, 4.0 inch square x 0.188 inch thick.
 - (b) Rolled Side Frame, 2.0 inch x 3.0 inch x 0.125 inch, Tig Welded to Corner Upright Posts.
 - (c) Radiused Outside Corners
 - (d) Powder Coated White
 - 6) Ground Bar fabricated of 6061 T6 extruded aluminum tube, 2.0 inch square x 0.250 inch thick having the following attributes:
 - (a) Powder Coated White.
 - 7) Accessories:
 - (a) Welded Aluminum Net Clips; Guaranteed for life.
 - (b) Polypropylene Soccer Net: Color selected from standard net colors.
 - (c) Associated Stainless Steel Hardware
3. Soccer Goal Portable Wheel Mobility Kit:
 - a. Soccer Goal Wheel Insert
 - 1) Welded 13 Ga. Stainless Steel Frame
 - 2) Ultra High Molecular Weight Plastic Wheel
 - 3) All Stainless Steel Hardware
 - b. Soccer Goal Mobility Handle:
 - 1) Aluminum Frame
 - 2) All Stainless Steel Hardware
 - 3) Powder Coat: White
4. Soccer Goal Back Bar Safety Clamp Kit:

- a. Safety Clamp on Turf Field:
 - 1) Fabricated of (0.187 inch) 3/16 inch Aluminum
 - 2) Powder Coated White
 - 3) Stainless Steel Hardware
- b. Anchor Pin System for natural grass practice field.

2.04 PRACTICE FOOTBALL GOAL POSTS

- A. Model # GP4300 Football Goal Post - Ground Sleeve Mounted as manufactured by Sportsfield Specialties, Inc. (Basis of Design).
- B. Gooseneck support: fabricated of 6" Schedule 40 aluminum pipe (6.625in OD), 5.0ft radius, 6.0ft offset.
- C. Crossbar: fabricated of 6" Schedule 40 aluminum pipe (6.625in OD).
 1. Length: 23ft 4in
 2. With internal rotating sleeve for upright adjustment that utilizes precision fit textured mating surfaces, for locking into the vertical position.
- D. Uprights: fabricated of extruded 6061 T6 aluminum tube (4.0in OD) with rigid wire loop at upper end
 1. Length: 20.0ft
- E. Powder Coat Finish: Yellow or White
- F. Installation package consisting of the following components:
 1. Ground sleeve: 8.0 inch Schedule 40 steel pipe, 5.0ft long
 2. Access frame: fabricated of 0.125 inch aluminum, 22.25 inch square, 6.0 inch high, with eight anchor bolts, filler plugs fabricated of 0.5in pressure treated plywood and 0.1875 inch (3/16") aluminum.
- G. Accessories:
 1. Directional wind flags.
 2. Touch-up paint (Powder Coat Specific).
 3. Assembly bolts, and nuts- Stainless Steel

2.05 SOCCER

- A. Model # SG4900 Soccer Goal as manufactured by Sportsfield Specialties, Inc. (Basis of Design).
- B. Square Post Soccer Goal, refer to 2.03, B.2, B.3 and B.4.
- C. Provide Anchor Pin system for natural grass installation.
- D. Provide turf covered safety system at artificial turf installation. Refer to 2.03, B.4.
 1. Product: Model # SG2S as manufactured by Sportsfield Specialties, Inc.

2.06 BASEBALL/SOFTBALL

- A. Baseball/Softball Aluminum Foul Pole:
 1. Foul Pole 4" o.d. x .226" wall reinforced 6061T6 extruded aluminum tube.
 - a. Baseball: 20'-0" high (24'-0" overall).
 - b. Softball: 15'-0" high (19'-0" overall).
 2. Frame 1.900" od. x .125" wall extruded aluminum tube, 2' x 10'-2 1/2" welded frame, 1-1/2" sq. x 3/16" thick aluminum lockcrimp mesh.
 3. Finish: Powder-coated yellow.
 4. Ground Sleeve 4.350" o.d. x .100" wall x 48" long aluminum tube,
 5. Hardware: Stainless steel.
 6. Product:

- a. Baseball Model # LGFPW420 manufactured by Sportsfield Specialties Inc. (Basis of Design).
 - b. Softball Model # LGFPW415 manufactured by Sportsfield Specialties Inc. (Basis of Design).
- B. Home Plate With Anchor:
1. Professional homeplate with ground anchor
 2. Product: Model 310-shp manufactured by Bolco. (Basis of Design).
- C. Anchor Bases:
1. One-piece, all rubber construction with modular heavy-gauge non-collapsible textured white rubber.
 2. Universal aluminum hollow stanchion anchor adaptable with male stake and female ground receptacle.
 3. Set includes: 3 bases, 3 anchors & 3 plugs. 15" x 15" x 3"
 4. Products:
 - a. Model # TB-K13348, 100-ML Bases manufactured by Bolco. (Basis of Design).
- D. Pitcher's Rubber:
1. 24" Dual Stanchion Pitching Rubber with anchor system.
 2. Product: Model #02908 Import Double Stanchion Baseball Pitching Rubber provided by Sports Advantage. (Basis of Design).
 3. Alternate Product: Model LBMPR224 Baseball Pitching Rubber manufactured by Schutt Sports.
- E. Tension Netting:
1. Product: Model # TFBSS-TN manufactured by Sportsfield Specialties Inc. (Basis of Design).
 - a. Baseball: 40' high custom backstop.
 - b. Softball: 30' high custom backstop.
- F. Batting tunnel:
1. Overhead style Long Gone™ batting tunnel manufactured by Sportsfield Specialties, Inc. (Basis of Design).
 - a. Baseball: Triple Batting Tunnel No. LGOBT-BT-P.
 - b. Softball: Double Batting Tunnel No. LGOBT-SD-P.
 2. Upright fabricated with 4" O.D. x 1/8" Wall Aluminum Tube:
 - a. Height above ground = 15'-11"
 - b. Powder Coat Option
 3. Crossbar fabricated with 4" O.D. x 1/8" Wall Aluminum Tube:
 - a. 199.750" Length
 - b. Powder Coat Option
 4. Arm-D fabricated with 2" X 2" X 1/8" Square Aluminum Tube and 4" Schedule 40 Aluminum Pipe:
 - a. Aluminum Mill Finish, with Powder Coat Option
 5. Ground sleeves fabricated with 4.30" O.D x 4.10" I.D. Aluminum Tube:
 - a. 30" Length
 - b. Aluminum Mill Finish
 - c. Ground Sleeve Caps included
 6. Baseball /Softball Batting Tunnel Net:
 - a. #36 Black Nylon 1-3/4" Mesh
 - 1) Baseball: Three nets 14' W x 13' H x 75'L.
 - 2) Softball: Two nets 14' W x 13' H x 55'L.
 7. Hardware Kit

- a. Stainless Steel Assembly Hardware
 - b. Quick-Clips for Net Attachment
 - c. Tethers
 - 1) Black Vinyl Coated Wire Rope
- G. Baseball Windscreen, Distance Banner, Batter's Eye:
1. Windscreen: Diamond Weave Mesh, Black, Model # Wind 538 manufactured by Nylon Net Co.
 2. Distance Banner: Heavy duty 16 oz vinyl banner with 24" numbers on 38" x 56" banner.
 - a. Product: Model # TB-K13407 manufactured by Tomark Sports. (Basis of Design).
 3. Batter's Eye: 30' H x 60' W Windscreen, Model # SSI-TAO-0-CSTM manufactured by Sportsfield Specialties, Inc. (Basis of Design).
- H. Softball Windscreen with Distance Banner:
1. Heavy-duty open-mesh, vinyl coated Mesh fabric windscreen
 - a. Product: Model 6' high, black FencePro TB-K15246 manufactured by Tomark Sports. (Basis of Design).
 2. Distance Banner: Heavy duty 16 oz vinyl banner with 14" numbers on 27" x 36" banner.
 - a. Product: Model # TB-K13456 manufactured by Tomark Sports. (Basis of Design).
- I. Fence Guards: Enduro Fence Topper, Blue, Model # TB-K35625 manufactured by Tomark Sports. (Basis of Design).
- J. Baseball Home Plate Halo and On-Deck Circles:
1. 10' Halo DiamondTurf Mat, Product: Model # TB-K13173 manufactured by Tomark Sports. (Basis of Design).
 2. 6' Dia. Supreme DiamondTurf Logo On-deck Circle, Product: Model # TB-K13199 manufactured by Tomark Sports. (Basis of Design).
- K. Helmet & Bat Storage: Long Gone "Cubby", 90" x 60" x 36" manufactured by Sportsfield Specialties, Inc. (Basis of Design).
- L. Clay Bricks: 4" x 8" x 2-1/2" clay bricks:
1. Product: Model # TB-K15228 manufactured by Diamond Master, Inc. (Basis of Design).
- M. Warning Track and Infield Surface:
1. Warning Track: Model # DT Warning Track Mix, 6" thickness, manufactured by Diamond Tex.
 2. Infield and Bullpens: Model # DT Professional Mix, 6" thickness, manufactured by Diamond Tex.
 3. Infield Conditioner: Model # DP Red Infield Conditioner, 1/2" thickness, manufactured by Diamond Pro.

2.07 FIELD HOCKEY

- A. Goals: 12'-4" wide, 7'-2" high, 4'-0" depth.
1. 2" square slotted structural aluminum extrusion with rounded outside corners.
 2. Continuous positive net attachment.
 3. Heli-arc welded one-piece construction goal mouth and rear frame.
 4. 18" high bottom boards bolted to welded, reinforced aluminum framework with all stainless steel hardware.
 5. Goal mouth features a white powder-coated finish.

6. Product: Model #FHG01 Field Hockey Goal as manufactured by Sportsfield Specialties Inc. (Basis of Design).

B. Accessories:

1. Black Nylon Net
2. Stainless Steel Assembly Hardware
3. FHG-WK SG Field Hockey Goal Wheel Kit
4. FHC-CLAMP SG2S Safety Ground Clamp System on Turf Field.

2.08 LACROSSE GOALS

- A. Provide Model # LCG01 Lacrosse Goal as manufactured by Sportsfield Specialties Inc. (Basis of Design).

B. Frame:

1. Uprights and Top Bar Fabricated of 1.50in Schedule 40 Steel Pipe, Tig Welded
2. Powder Coat: Orange

C. Ground Bar:

1. Fabricated of Steel Bar, Tig Welded
2. Powder Coat: Orange

D. Accessories:

1. Standard White Nylon Net
2. Stainless Steel Assembly Hardware
3. Anchoring pins.

2.09 TRACK AND FIELD

A. Pole Vault :

1. Landing Pad with Skirted Breather Cover
 - a. Product: Model # SPV-30XL manufactured by AAE. (Basis of Design).
2. Side Pads:
 - a. Product: Model # PVB-32XL manufactured by AAE. (Basis of Design).
3. Weather Cover
 - a. Product: Model # SWC-30XL manufactured by AAE. (Basis of Design).
4. High School Pole Vault Standards
 - a. Product: Model # PVS-HSX manufactured by AAE. (Basis of Design).
5. Pole Vault Crossbars
 - a. Product: Model # XG5 manufactured by AAE. (Basis of Design).
6. Vault Box Collar
 - a. Product: Model # VBC manufactured by AAE. (Basis of Design).
7. Mechanical Measuring Bars
 - a. Product: Model # AMB-6 manufactured by AAE. (Basis of Design).
8. Crossbar Lifters
 - a. Product: Model # ALT-20 manufactured by AAE. (Basis of Design).

B. Long Jump Pit Form:

1. Polymer concrete curbing with thermoplastic elastomer (TPE) rubber cap (white) and sand catcher.
2. Provide cover panels with recessed handles and top surface to accept synthetic track surfacing.
3. Provide jump pit assembly kit.
4. Product: Model # 7300 Modular Long Jump Pit with Flushend option manufactured by ACO Polymer Products, Inc. (Basis of Design).

C. High Jump:

1. Landing pad with Skirted Breather Cover.
 - a. Product: Model # IAP-26 manufactured by AAE.(Basis of Design).
 - b. Weather Cover
 - 1) Product: Model # IWC manufactured by AAE. (Basis of Design).
 - c. High Jump Standards
 - 1) Product: Model # MJS manufactured by AAE. (Basis of Design).
 - d. High Jump Crossbars
 - 1) Product: Model # XG4 manufactured by AAE. (Basis of Design).
- D. Throwing Form Systems:
 1. Nominal 10' x 10' x 6" welded aluminum concrete form.
 2. 2" x 2" x 1/4" thick aluminum angle circles
 3. Circle diameters:
 - a. Discus: 8' 2-1/2"
 - 1) Product: Model # DFS manufactured by AAE. (Basis of Design).
 - b. Shot Put: 7'-0"
 - 1) Product: Model # SHFS manufactured by AAE. (Basis of Design).
 4. Discus Cage: Product: Model # HSDC manufactured by AAE. (Basis of Design).
 5. Shot Put Cage: Product: Model # SC-12 manufactured by AAE. (Basis of Design).
- E. High School Hurdle:
 1. Aluminum Frame
 2. Push-button height adjustment modified to 24"/27"/30"/33"/36"
 3. Flat base, stabilizer bar and reinforced post welded into 3-way hurdle frame
 4. Powder-coated telescoping tubes
 5. Self-adjusting weights
 6. Double-web Lexan board - standard 41" width
 7. Product: Model # XLAH-CP manufactured by AAE. (Basis of Design).

2.10 TENNIS COURT EQUIPMENT

- A. Tennis Posts: Classic Round Post, (Green), manufactured by Edwards. (Basis of Design).
 1. Product: Tomark Model # TB-K15415.
 2. Provide round, 3-inch-diameter steel tubing with an internal brass winder mechanism and removable handle, steel pulley and axle, and net lacing bars.
 3. Provide complete with galvanized ground sleeves Model # TB-K15418 and galvanized center anchor Tomark Model # TB-K15412.
- B. Tennis Net: Model #30LS manufactured by Edwards. (Basis of Design).
 1. Product: Tomark Model # TB-K15428.
 2. Provide heavy duty 34 oz. headband sewn with four rows of Dacron thread.
 3. The net body 3.5mm braided polyethylene twine.
 4. The net is supported by a 5mm PVC-coated aircraft cable with an extra-heavy-duty bottom tape to resist court abrasion. Thick pockets allow side sticks to be inserted.
- C. Center Net Strap: manufactured by Edwards. (Basis of Design).
 1. Product: Tomark Model # TB-K15409.
 2. Polyester tennis net strap with a snap for the center of the net.
- D. Windscreen: Premium grade windscreen with reinforcement and vents.
 1. Product: Model # WSP7850 as manufactured by Nylon Net, Inc..

2.11 OUTDOOR SCOREBOARDS

- A. Baseball/Softball:
 1. Size: 18' x 8' x 8" with 24" digital display and wireless controller.
 2. Product: Model # 1530 manufactured by Nevco. (Basis of Design).

3. Product: Similar Model manufactured by Daktronics.
- B. Football/Soccer/Lacrosse/Track/Field Hockey Stadium:
 1. Size: 24' x 10'-6" x 8" with 24 " digital display, 1/10 of a second timing and wireless controller.
 2. Product: Model # 7525 manufactured by Nevco. (Basis of Design).

PART 3 EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions where equipment and systems are to be installed and notify the contractor of conditions detrimental to the proper and timely installation and completion of the work.
- B. Do not proceed with the work until unsatisfactory conditions have been corrected by the contractor in a manner acceptable and to the satisfaction of the Architect/Engineer or Owner's Representative.

3.02 INSTALLATION

- A. All athletic equipment shall be installed as indicated on approved submittals as recommended and in strict accordance with manufacturer's written directions and as indicated on the drawings and specified herein.
- B. All concrete footings for athletic equipment shall be installed as indicated on the drawings and in accordance with Section 03 30 00, Cast-in-Place Concrete.
- C. All sleeves required for athletic equipment installation shall be set plumb and true to line and grade in concrete as indicated on the drawings and per manufacturer's recommendation.
- D. All athletic equipment shall be installed in strict accordance with the latest rules, regulations and specifications governing that sport or event for which it is being installed.

3.03 TESTING, ADJUSTMENT AND OPERATION

- A. All athletic equipment requiring testing, adjustments and operation shall be tested for proper operation and adjusted to conform to specified standards.
- B. Provide certifications as required, indicating that equipment has been tested and adjusted to conform to specified standards.
- C. Provide operating and maintenance instructions and manuals to Owner -designated personnel for the proper operation and care of equipment after equipment has been tested and adjusted to conform to specified standards.

3.04 CLEANING

- A. Upon completion of work in any given area, remove all trash and debris from the work area and leave in clean condition.

END OF SECTION -

SECTION 11 68 33

STADIUM PADDING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide all equipment and materials, and do all work necessary to furnish and install the athletic equipment, as indicated on the drawings and as specified herein. Athletic equipment shall include, but not be limited to:

1. BaseZone® Stadium Padding

1.02 RELATED WORK

- A. Examine contract documents for requirements that affect work of this section. Other specification sections that directly relate to the work of this section include, but are not limited to:

1. 32 18 13 – Athletic and Recreational Surfacing
2. 03 10 00 – Concrete Forming and Accessories
3. 03 20 23 – Concrete Reinforcing
4. 32 31 00 – Fences and Gates

1.03 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. National Federation of State High School Associations (NFHS)
2. National Collegiate Athletic Association (NCAA)
3. International Amateur Athletic Association (IAAF)
4. American Sports Builders Association (ASBA)
5. American Wood Preserver's Association (AWPA)
6. Manufacturers Data and Recommended Installation Requirements

1.04 SUBMITTALS

- A. Manufacturers Product Data

1. Provide manufacturers product data prior to actual field installation work, for Architects or Owners representatives review.

B. Shop Drawings

1. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Architects or Owners representatives review.

1.05 QUALITY ASSURANCE

- A.** Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.06 PRODUCT DELIVERY AND STORAGE

- A.** Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Owners representative. Replacements, if necessary, shall be immediately re-ordered, so as to minimize any conflict with the construction schedule. Sound materials shall be stored above ground under protective cover or indoors so as to provide proper protection.

PART 2 PRODUCTS

2.01 BaseZone® Stadium Padding

- A.** BASE: BaseZone® Stadium Padding as manufactured by:

Promats Athletics, LLC.
P.O. Box 2489
Salisbury, NC 28145
P: 800-617-7125
F: 704-637-2145
<http://www.promatsathletics.com/>

B. COMPONENTS:

1. 3” High Impact Polyurethane Foam
2. 5/8” Water Resistant Composite Wood Panel, Painted, Primed, and Sealed on all sides.
3. 18 oz. High UV Vinyl, 5 year Limited Fade Warranty
4. Stainless Steel Staples, T-Nuts, Bolts
5. 1 Year Limited Warranty

PART 3 EXECUTION

3.01 INSTALLATION OF EQUIPMENT

- A.** All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

Qualifications; three installs in three years.

END OF SECTION

SECTION 12 24 13

WINDOW TREATMENT – ROLLER SHADES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Manual roller shades with light filtering fabric for exterior clear glazed windows and interior vision panels, doors and sidelights as scheduled.
- C. Provide multi-band operation of two or more shades with a single operator.

1.02 REFERENCES

- A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- B. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.03 SUBMITTALS

- A. Submit under provisions of Section 013000.
- B. Product data: Provide manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
 - 3. Storage and handling requirements and recommendations.
 - 4. Mounting details and installation methods.
- C. 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.
- D. Samples for Initial Selection: For each colored component of each type of roller shade indicated.
- E. Window Treatment Schedule: Submit Window Treatment Schedule using same room designations indicated on Drawings.
- F. Maintenance Data: Include in maintenance manuals:
 - 1. Methods for maintaining roller shades/blinds and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
 - 3. Operating hardware.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has successfully completed and serviced installations similar in scope to that indicated for this Project.
- B. Source Limitations: Obtain each type of window treatment through one source from a single manufacturer.

- C. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.
- D. Fire-Test-Response Characteristics: Provide window treatment 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.
- E. Mock-Up: Provide a mock-up (manual shades only) of one roller shade assembly for evaluation of mounting, appearance and accessories.
 - 1. Locate mock-up in window designated by Architect.
 - 2. Do not proceed with remaining work until, mock-up is accepted by Architect.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in factory packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in window treatment schedule.

1.06 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install window treatment 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. 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.

1.07 WARRANTY

- A. Products: Minimum 10 years from substantial completion or manufacturer's standard warranty.
- B. Installation: One year from substantial completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Approved Manufacturer: This Specification is based on products as indicated under individual product descriptions.

2.02 MANUAL ROLLER SHADES

- A. Basis of specification
 - 1. For base bid:
 - a. MechoShade: MechoShade/5 with ThermoVeil 1000 Series.
 - b. Subject to compliance with requirements, the following additional manufacturers are also approved:
 - 1) Draper Shade & Screen Co., Inc.; Manual FlexShade XD with Phifer 4400 3% open or similar.
 - 2. Color: One standard color as selected by Architect from manufacturer's standard
 - 3. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of

diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with manufacturer's standard method for attaching shade material. Provide capacity for one roller shade band per roller.

4. Direction of Roll: Regular, from back of roller.
5. Mounting Brackets: Mecho/5 Extended Bracket. Sizes to be compatible with window /shade size and clutch capacity. Bracket style to be compatible with mounting requirements and site conditions.
6. Bottom Bar: Steel or extruded aluminum. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
7. Shade Operation: Manual - with continuous loop bead chain, clutch, and cord tensioner and bracket lift operator.
8. Position of Clutch Operator: Right side of roller, as determined by hand of user facing shade from inside, unless otherwise indicated or dictated by field conditions.
9. Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
10. Lift Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
11. Bead Chain: Nickel-plated metal or Stainless steel.
12. Cord Tensioner Mounting: As required per installation.
13. Operating Function: Stop and hold shade at any position in ascending or descending travel.
14. Fascia: SnapLoc Fascia.
15. Shade cloth: Provide the following as shown and scheduled:
 - a. WT-1: ThermoVeil Dense Vertical Weave, 1000 Series (2-3% open)
 - b. WT-2: Equinox Blackout, 0100 Series (opaque)

B. ROLLER SHADE FABRICATION

1. Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.
2. Concealed Components: Non-corrodible or corrosion-resistant-coated materials.
 - a. Lifting Mechanism: With permanently lubricated moving parts.
3. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
 - a. Shade Units installed outside (typical) : If inside mount is required, edge of shade not exceed 1/4 inch from face of jamb.
 - b. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.
 - c. Fabricate shadecloth to hang flat without buckling or distortion.
4. Installation Brackets: Shall allow for easy removal and reinstallation of shade, operating hardware and for hardware position and shade mounting method indicated.
5. Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal non-corrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.
6. Colors of Metal and Plastic Components Exposed to View: As selected by Architect from manufacturer's full range, unless otherwise indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 ROLLER SHADE INSTALLATION AND ADJUSTING

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
- B. Install roller shades for multi-band operation in locations shown.
 - 1. Provide Lift-Assist Mechanism at multi-band shades over 8 pounds, or as required by manufacturer.
- C. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.03 CLEANING AND PROTECTION

- A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- B. Remove surplus materials, rubbish, and debris resulting from installation upon completion of work, and leave areas of installation in neat, clean condition.
- C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, which ensure that roller shades are without damage or deterioration at time of Substantial Completion.

3.04 SCHEDULE

- A. Provide roller shades at the locations shown on the Drawings.

END OF SECTION

SECTION 12 34 00

LAMINATE CLAD CASEWORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Refer to Scope Information Sheets for this contract bound in the Project Manual under Section 01 10 00, Summary of Work. The Scope Information Sheets describe generally the work included in each contract, but the work is not necessarily limited to that described.
- B. Fixed modular laminate clad casework and components.

1.02 RELATED SECTIONS

- A. Section 06 10 00: Blocking within walls where indicated.
- B. Division 9: Base molding.
- C. Section 12 36 00: Countertops

1.03 DEFINITIONS

- A. Identification of casework components and related products by surface visibility.
 - 1. Open Interiors: Any open storage unit without solid door or drawer fronts, units with full glass insert doors and/or acrylic doors, and units with sliding solid doors.
 - 2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts.
 - 3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
 - 4. Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.
 - 5. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.
 - 6. Concealed Surfaces: Any surface not visible after installation.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.
- B. Manufacturer: Provide products certified as meeting or exceeding ANSI-A 161.1-2000 testing standards.

1.05 SUBMITTALS

- A. Comply with Section 01 30 00, unless otherwise indicated.
- B. Product Data: Manufacturer's catalog with specifications and construction details.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
 - 1. Include section drawings of typical and special casework, work surfaces and accessories.
 - 2. Indicate locations of plumbing and electrical service field connection by others.
- D. Component samples: Two sets of samples for each of the following:
 - 1. Decorative laminate color charts.

2. PVC edgings.

1.06 PRODUCT HANDLING

- A. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 25 percent to 55 percent.
- B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.07 JOB CONDITIONS

- A. Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.
 1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
 2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.
- B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

1.08 WARRANTY

- A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Approved Manufacturers:
 1. Basis of specification: TMI Systems Design Corporation.
 2. LSI
 3. Case Systems
- B. Substitution: See Section 01 60 00 . Other manufacturers shall comply with the minimum levels of material and detailing indicated on the drawings or as specified.
 1. Subject to compliance with the specifications, the following manufacturers are approved:
 - a. Stevens Industries, Inc.
 - b. Mastercraft, Inc.

2.02 MATERIALS

- A. BASE BID : Core Materials:
 1. Certified Particleboard: SCS Certified 100% pre-consumer recycled wood fiber particleboard with no Urea Formaldehyde added during the manufacturing process.
 - a. Up to 7/8 inch thick: Industrial Grade average 47-pound density meeting ANSI A 208.1-1999, M-3 requirements.
 - b. 1 inch thick: Industrial Grade average 45-pound density meeting ANSI A 208.1-1999, M-2 requirements.
 - c. MR Moisture Resistant Particleboard: Average 47-pound density particleboard, ANSI A208.1 1-1999, M-3.
 2. Medium Density Fiberboard 1/4 inch thick: Average 54-pound density grade, ANSI A208.2.
- B. Decorative Laminates: GREENGAURD Indoor Air Quality Certified
 1. High-pressure decorative laminate VGS (.028), NEMA Test LD 3-2005.

2. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2005.
 3. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-2005.
 4. High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2005.
 5. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-2005.
 6. Thermally fused melamine laminate, NEMA Test LD 3-2005, color matched with White.
- C. Laminate Color Selection: Maximum 1 color per unit face and 4 colors per project. (See Color Selection in section 3.06).
- D. Edging Materials:
1. 3mm PVC banding, machine applied and machine profiled to 1/8 inch radius.

2.03 CABINET HARDWARE

- A. Hinges:
1. Five knuckle, epoxy powder coated, institutional grade, 2-3/4 inch overlay type with hospital tip. 0.095 inch thick. ANSI-BHMA standard A156.9, Grade 1.
 - a. Doors 48 inches and over in height have 3 hinges per door.
 - b. Magnetic door catch with maximum 5 pound pull provided, attached with screws and slotted for adjustment.
- B. Pulls:
1. Door and drawer front pulls are rectangular, semi-recessed, injection molded plastic, screw fastened. Pull design shall comply with the Americans with Disability Act (ADA).
- C. Drawer Slides:
1. Full extension: 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature.
- D. Adjustable Shelf Supports:
1. Injection molded transparent polycarbonate shelf supports friction fit into cabinet end panels and vertical dividers, adjustable. Shelf support have minimum 2 integral support pins to interface pre-drilled holes, and to prevent accidental rotation of support. The support shall adapt to 3/4 inch or 1 inch thick shelving and provides non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pounds per support) without failure.
- E. Locks:
1. Removable core, disc tumbler, cam style lock with strike. Lock for sliding 3/4 inch thick doors is a disc type plunger lock, sliding door type with strike.
 2. Elbow catch or chain bolt used to secure inactive door on all locked cabinets.

2.04 FABRICATION:

- A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.
- B. All casework panel components sized/cured to be precisely finished in size and squareness to within 0.010 inches, ensuring strict dimensional quality and structural integrity in the final fabricated product.
- C. Cabinet Body Construction:
1. Tops and bottoms shall be glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals.
 - a. Tops, bottoms and sides of all cabinets are particleboard core.

- b. Tops, bottoms and sides of sink base units are moisture resistant particleboard core.
 2. Cabinet backs: 1/4 inch thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4 inch x 4 inch particleboard rails will be placed behind the back panel at the top and bottom, and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt glue to further secure back and increase overall strength.
 3. Fixed base and tall cabinets shall have factory mounted bases of 3/4 inch thick exterior grade plywood. Base is nominal 4 inch high unless otherwise indicated on the drawings.
 4. Base units, except sink base units: Full sub-top. Sink base units are provided with open top and a stretcher at the front, attached to the sides. Back to be split removable access panel.
 5. Side panels and vertical dividers shall receive adjustable shelf hardware. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
 6. Exposed and semi exposed edges.
 - a. Edging: 1mm PVC.
 7. Adjustable shelf core: 3/4 inch thick particleboard up to 36 inches wide, 1 inch thick particleboard over 36 inches wide.
 - a. Front edge: 1mm PVC.
 8. Interior finish, units with open Interiors:
 - a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with VGS high-pressure decorative laminate.
 9. Interior finish, units with closed Interiors:
 - a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused melamine laminate.
 10. Exposed ends:
 - a. Faced with VGS high-pressure decorative laminate.
 11. Wall unit bottom:
 - a. Faced with thermally fused melamine laminate.
 12. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.
- D. Drawers:
 1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with thermally fused melamine doweled and glued into sides. Top edge banded with 3mm PVC.
 2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with thermally fused melamine, screwed directly to the bottom edges of drawer box.
 3. Paper storage drawers: Minimum 3/4 inch thick particleboard sides, back, and sub front laminated with thermally fused melamine. Minimum 1/2 inch thick particleboard drawer bottoms screwed directly to the bottom edges of the drawer box. Provide PVC angle retaining bar at the rear of the drawer.
- E. Door/Drawer Fronts:
 1. Core: 3/4 inch thick particleboard except at sink units which is 3/4 inch thick moisture resistant particleboard.
 2. Provide double doors in opening in excess of 24 inches wide.
 3. Faces:
 - a. Exterior: VGS High-pressure decorative laminate.
 - b. Interior: High-pressure cabinet liner CLS.

4. Door/drawer edges: 1mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.
- F. Miscellaneous Shelving:
1. Core material: 3/4 inch or 1 inch thick particleboard.
 2. Exterior: VGS High-pressure decorative laminate.
 3. Edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

PART 3- EXECUTION

3.01 INSPECTION:

- A. The casework contractor must examine the job site and the conditions under which the work under this section is to be performed, and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION:

- A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 KEYING:

- A. Key alike by room, unless otherwise instructed.
- B. Provide locks for each cabinet.

3.04 INSTALLATION:

- A. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut for accurate fit.
- B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
 1. Install drawer pulls horizontally.
 2. Install door pulls vertically.
- C. Repair minor damage per plastic laminate manufacturer's recommendations.
- D. Install countertop and backsplash.
 1. Scribe and cut for accurate fit to wall and under window stools.
 2. Coordinate openings with grilles supplied in Section 06200.
 3. Provide 1 inch overhang at countertop over lockers.

3.05 CLEANING:

- A. Remove and dispose of all packing materials and related construction debris.
- B. Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

3.06 COLOR SELECTION:

- A. Laminate Color Selection: From Formica, Nevamar and Chem Metal stock colors.
- B. Hinge and Pull Color Selection: From manufacturer's standard
- C. Miscellaneous Hardware Color Selection (support brackets, table frames, rail): From manufacturer's standard.

- D. 1mm PVC Edge Banding Color Selection: From manufacturer's standard of colors matching decorative laminate.
- E. 3mm PVC Edge Banding Color Selection: Match decorative laminate color selection.

END OF SECTION