NCC VOCATIONAL TECHNICAL SCHOOL DISTRICT

RENOVATIONS TO HOWARD HIGH SCHOOL OF TECHNOLOGY

BID PACKAGE 'D'

February 6, 2017

TABLE OF CONTENTS

DIVISION 0 - PROCUREMENT AND CONTRACT REQUIREMENTS

000110 Table of Contents
001113 Advertisement for Bid
002113 Instructions to Bidders
004100 Bid Forms
005200 Agreement
006113 Performance and Payment Bonds
006216 Certificate of Insurance
007200 General Conditions
007300 Supplementary General Conditions
007343 Wage Rate Requirements
008114 Drug Testing Forms

DIVISION 1 - GENERAL REQUIREMENTS

011100 Summary of Work - Work Covered by Contract Documents
012100 Allowances
012200 Unit Prices
012300 Alternates
012600 Change Order Procedures
012613 Contractor Compensation
012900 Payment Procedures
013113 Project Coordination Meetings
013119 Pre-Installation Meetings
013125 Web-Based Project Management System
013216 Construction Progress Schedule
013219 Submittal Register
013226 Contractor Daily Reports
013300 Submittal Procedures
013500 Contractor Employee Background Check
013523 Safety Program
014500 Quality Control
015113 Temporary Electricity
015123 Temporary Heating, Cooling and Ventilating
015200 Construction Facilities & Temporary Controls
016200 Material and Equipment
017329 Cutting and Patching
017700 Contract Closeout

DIVISION 01 – GENERAL REQUIREMENTS

019113 General Commissioning Requirements
019125 Exterior Enclosure Commissioning

DIVISION 02 - EXISTING CONDITIONS
02 4100 Demolition

DIVISION 03 - CONCRETE
030510 Concrete Moisture Vapor Reduction Admixture (MVRA)
033000 Cast-In-Place Concrete
033511 Concrete Floor Finishes

DIVISION 04 - MASONRY
040125 Masonry Cleaning
040126 Masonry Restoration
042000 Unit Masonry

DIVISION 05 - METALS
055000 Metal Fabrications
055213 Pipe, Tube and Decorative Railings
057500 Decorative Formed Metal

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES
061000 Rough Carpentry
062000 Finish Carpentry
064100 Architectural Wood Casework

DIVISION 07 - THERMAL AND MOISTURE PROTECTION
071800 Cold Fluid-Applied Waterproofing
072100 Thermal Insulation
072616 Under-Slab Vapor Barrier/Retarder
072640 Spray Polyurethane Foam Insulation Air Barrier
075300 Elastomeric Membrane Roofing
076200 Sheet Metal Flashing and Trim
077200 Roof Accessories
079200 Joint Sealants

DIVISION 08 - OPENINGS
081113 Hollow Metal Doors and Frames
081423 Clad Commercial Door
081433 Stile and Rail Wood Doors
083100 Access Doors and Panels
085200 Aluminum Clad Wood Windows
086300 Metal-Frames Skylights
087100 Door Hardware
087101 Hardware Sets
088000 Glazing
089100 Louvers

DIVISION 09 - FINISHES

090561 Common Work Results for Flooring Preparation
092116 Gypsum Board Assemblies
092236.23 Metal Lath
092300 Gypsum Plastering
092613 Gypsum Veneer Plastering
093000 Tiling
095100 Suspended Acoustical Ceilings
096229 Cork Flooring
096429 Wood Strip Flooring
096500 Resilient Flooring
096623 Epoxy-Resin Terrazzo Flooring
096800 Carpeting
098400 Acoustic Room Components
099000 Painting and Coating

DIVISION 10 - SPECIALTIES

101101 Visual Display Boards
102113.19 Plastic Toilet Compartments
102226 Vertical Folding Partitions
102800 Toilet Accessories
104400 Fire Protection Specialties
105100 Lockers

DIVISION 11 - EQUIPMENT

115213 Projection Screens
116133 Stage Rigging and Draperies
116623 Gymnasium Equipment

DIVISION 12 - FURNISHINGS

122413 Window Treatment – Roller Shades
122424 Electronic Roller Shade System
123400 Laminate Clad Casework
123553.19 Wood Laboratory Casework
123600 Countertops
126105 Auditorium Seating Restoration

DIVISION 26 - ELECTRICAL

265531 Stage Lighting System

END OF SECTION

SECTION 000115 LIST OF DRAWINGS

Sheet No.	Sheet Title
GENERAL:	
G-001.1	COVER SHEET
G-002	DRAWING LIST
G-003	CODE REVIEW
G-111	CODE REVIEW PLANS - LOWER LEVEL & FIRST FLOOR
G-112	CODE REVIEW PLAN - SECOND FLOOR
STRUCTURAL:	
S-001	GENERAL NOTES
S-111	FIRST FLOOR FRAMING PLAN – MAIN BUILDING
S-112	SECOND FLOOR FRAMING PLAN – MAIN BUILDING
S-121	ROOF FRAMING PLANS – MAIN BUILDING
S-203	SECTIONS AND DETAILS
ARCHITECTURAL:	
A-001	GENERAL NOTES, SYMBOLS AND ABBREVIATIONS
A-002	PARTITION TYPES & DETAILS
A-003	PARTITION TYPES & DETAILS
A-010	PHASING PLANS
A-101	DEMOLITION PLAN - LOWER LEVEL (MAIN)
A-103	DEMOLITION PLAN - FIRST FLOOR (MAIN)
A-105	DEMOLITION PLAN - SECOND FLOOR (MAIN)
A-106	DEMOLITION PLAN - ROOF (MAIN)
A-108	DEMOLITION - REFLECTED CEILING PLANS (MAIN BUILDING)
A-111	OVERALL FLOOR PLANS - LOWER LEVEL & FIRST FLOOR
A-112	OVERALL PLANS - SECOND FLOOR & ROOF PLAN
A-113	FLOOR PLAN - LOWER LEVEL (MAIN BUILDING)
A-115	FLOOR PLAN - FIRST (MAIN BUILDING)
A-117	FLOOR PLAN - SECOND (MAIN BUILDING)
A-121	REFLECTED CEILING PLAN - LOWER LEVEL (MAIN BUILDING)
A-123	REFLECTED CEILING PLAN - FIRST FLOOR (MAIN BUILDING)
A-125	REFLECTED CEILING PLAN - SECOND FLOOR (MAIN BUILDING)
A-130	ROOF PLAN - MAIN BUILDING
A-200	DEMOLITION - EXTERIOR ELEVATIONS OVERALL
A-201	DEMOLITION - EXTERIOR ELEVATIONS (MAIN BUILDING)
A-202	DEMOLITION - EXTERIOR ELEVATIONS (MAIN BUILDING)
A-210	EXTERIOR ELEVATIONS OVERALL
A-211	EXTERIOR ELEVATIONS (MAIN BUILDING)
A-212	EXTERIOR ELEVATIONS (MAIN BUILDING)
A-214	EXTERIOR ELEVATIONS (MAIN BUILDING)
A-221	EXTERIOR ELEVATIONS - HISTORICAL RESTORATION (MAIN BUILDING)
A-222	EXTERIOR ELEVATIONS - HISTORICAL RESTORATION (MAIN BUILDING)
A-223	EXTERIOR ELEVATIONS - HISTORICAL RESTORATION (MAIN BUILDING)

A-310	BUILDING SECTIONS (MAIN BUILDING)
A-311	WALL SECTIONS (MAIN BUILDING)
A-312	WALL SECTIONS (MAIN BUILDING)
A-313	WALL SECTIONS (MAIN BUILDING)
A-314	WALL SECTIONS (MAIN BUILDING)
A-315	WALL SECTIONS (MAIN BUILDING)
A-316	WALL SECTIONS (MAIN BUILDING)
A-421	ENLARGED TOILET ROOM PLANS (MAIN BUILDING)
A-423	TOILET ROOM ELEVATIONS (MAIN BUILDING)
A-424	ENLARGED PLANS – SCIENCE LAB (MAIN)
A-450	EXTERIOR STAIRS - PLANS AND SECTIONS
A-451	PLANS & SECTIONS - STAIR M1 & M4
A-458	PLANS & SECTIONS - ELEVATOR ELM01
A-472	INTERIOR ELEVATIONS – LOWER LEVEL CORRIDORS AND LOBBY (MAIN)
A-473	INTERIOR ELEVATIONS – CORRIDORS (MAIN)
A-474	INTERIOR ELEVATIONS – AUDITORIUM/AUXILIARY GYM (MAIN)
A-475	INTERIOR ELEVATIONS – AUDITORIUM (MAIN)
A-478	INTERIOR DETAILS (MAIN)
A-479	INTERIOR DETAILS (MAIN)
A-502	ROOF DETAILS
A-522	SECTION DETAILS
A-525	SECTION DETAILS
A-526	SECTION DETAILS
A-531	PLAN DETAILS
A-601	DOOR SCHEDULES & DOOR TYPES
A-602	DOOR FRAME TYPES
A-611	WINDOW TYPES
A-612	WINDOW & LOUVER TYPES
A-620	HOLLOW METAL FRAME DOOR DETAILS
A-630	WOOD FRAME DOOR DETAILS
A-633	WOOD FRAME DOOR DETAILS
A-634	WOOD FRAME DOOR DETAILS
A-640	ALUMINUM CLAD WOOD DOOR & WINDOW DETAILS
A-641	ALUMINUM CLAD WOOD DOOR & WINDOW DETAILS
A-642	ALUMINUM CLAD WOOD DOOR & WINDOW DETAILS
A-643	ALUMINUM CLAD WOOD DOOR & WINDOW DETAILS
A-650	ALUMINUM WINDOW & DOOR DETAILS
A-651	ALUMINUM DOOR & WINDOW DETAILS
A-660	OVERHEAD SECTIONAL DOOR DETAILS
A-670	DOOR THRESHOLDS & TRANSITION STRIPS
A-680	LOUVER TYPES & DETAIL
INTERIORS:	
I-002	FINISH SCHEDULE - MAIN BUILDING
I-111	FINISH PLAN - LOWER LEVEL (MAIN BUILDING)
I-113	FINISH PLAN - FIRST (MAIN BUILDING)
I-115	FINISH PLAN - SECOND FLOOR (MAIN BUILDING)

I-131	FURNITURE PLAN - LOWER LEVEL (MAIN BUILDING)
I-133	FURNITURE PLAN - FIRST FLOOR (MAIN BUILDING)
I-135	FURNITURE PLAN - SECOND FLOOR (MAIN BUILDING)
THEATER:	
TE-100	STAGE EQUIPMENT AND DRAPERIES
TE-101	STAGE EQUIPMENT AND DRAPERIES EQUIPMENT PLAN WITHOUT TENSION GRID
TE-102	STAGE EQUIPMENT AND DRAPERIES GENERAL LAYOUT TENSION WIRE GRID
TE-103	STAGE EQUIPMENT AND DRAPERIES STAGE EQUIPMENT LAYOUT (WITHOUT TENSION GRID)
TE-104	STAGE EQUIPMENT AND DRAPERIES TYPICAL SECTION
TE-105	STAGE EQUIPMENT AND DRAPERIES FOH AND ROLL DROP HOISTS AND SCHEDULES
TE-105	STAGE EQUIPMENT AND DRAPERIES ALTERNATE HOISTING SYSTEMS
TL-100	STAGE LIGHTING SYSTEMS AUDITORIUM AND STAGE - STAGE LIGHTING DEVICE PLAN
TL-101	STAGE LIGHTING SYSTEMS AUDITORIUM DEVICE PLAN, DEVICE LEGEND, CONTROL AND POWER RISERS
TL-102	STAGE LIGHTING SYSTEMS SYSTEM ONE-LINE
TL-103	STAGE LIGHTING SYSTEMS DISTRIBUTION AND MISCELLANEOUS DETAILS
TL-104	STAGE LIGHTING SYSTEMS FIXTURE PLAN
TS-100	AUDITORIUM AUDIO & VIDEO SYSTEMS FIRST FLOOR DEVICE LOCATIONS
TS-101	AUDITORIUM AUDIO & VIDEO SYSTEMS SECOND FLOOR DEVICE LOCATIONS
TS-102	AUDITORIUM AUDIO & VIDEO SYSTEMS CONDUIT RISERS
TS-103	AUDITORIUM AUDIO & VIDEO SYSTEMS DEVICE KEY & POWER
TS-104	AUDITORIUM AUDIO & VIDEO SYSTEMS AUDIO ONE-LINE DIAGRAM
TS-105	AUDITORIUM AUDIO & VIDEO SYSTEMS VIDEO ONE-LINE DIAGRAM
TS-106	AUDITORIUM AUDIO & VIDEO SYSTEMS RACK AND PLATE DETAILS

END OF SECTION

SECTION 001113 ADVERTISEMENT FOR BID

Receipt of Bids

Public notice is hereby given that sealed bids for the following prime contract will be received for the renovations to the Howard High School of Technology. Bids will be received at the **NCC Vocational Technical School District 1417 Newport Road, Wilmington, Delaware 19804 until 2:00 PM local time on April 4, 2017**, at which time they will be publicly opened and read aloud. ***Bids will not be accepted at the offices of EDiS. 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 2 calendar days notice to the Bidders.

Contract HHS-30:	Demolition
Contract HHS-31:	Concrete
Contract HHS-32:	Masonry and Masonry Restoration
Contract HHS-33:	Miscellaneous Steel
Contract HHS-34:	Carpentry/Rough and Finish
Contract HHS-35:	Metal Framing, Drywall, Plaster
Contract HHS-36:	Acoustical Ceilings and Panels
Contract HHS-37:	Terrazzo Flooring
Contract HHS-38:	Flooring
Contract HHS-39:	Laminate Casework and Millwork
Contract HHS-40:	Roofing, Sheet Metal and Waterproofing
Contract HHS-41:	Ceramic Tile
Contract HHS-42:	Painting and Coatings
Contract HHS-43:	Window Treatments
Contract HHS-44:	Aluminum Windows
Contract HHS-45:	Wood Flooring

Bidding Document

Documents may be viewed and downloaded at EDiS' FTP site on or after Monday, January 23, 2017. Bidders requesting the log on information may obtain user name and password permission by contacting Jackie McKee with EDiS Company at jmckee@ediscompany.com. Each contractor will be required to provide the following information prior to receiving the log on information: company name, contact name, email address, phone number, fax number and postal mailing address.

It is the responsibility of each bidder to review and coordinate all Project Documents. This includes plans, specifications and addendums. Documents may be examined on the State of Delaware Online Bid Solicitation Directory, bids.delaware.gov, or at the office of the Construction Manager, EDIS Company, 110 S. Poplar Street, Suite 400, Wilmington, Delaware 19801.

Bid Security

A bid security in the amount of 10% of the bid including all alternates, plus a consent of surety must accompany each bid. Bid Security shall specify the Owner: NCC Vocational Technical School District 1417 Newport Road, Wilmington, Delaware 19804.

Pre-Bid Meeting

A pre-bid meeting will be held at **Howard High School, 401 East 12th Street Wilmington, Delaware 19801** on **Thursday, March 2, 2017 at 3:30 PM local time.** A site visit will be conducted immediately following the pre-bid meeting. These site visits will be the only opportunities for the bidders to visit the existing building and review existing conditions affecting the work. Attendance is highly recommended but not mandatory.

Questions

Please contact EDiS Company, Kevin Lucas at klucas@ediscompany.com or 302-421-2893 or 302-420-3083 with questions.

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

Prevailing Wage Rates, as described by Delaware Law, must be adhered to where applicable.

Pursuant to the Office of Management and Budget (OMB) ***"4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects"*** requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds implement a Mandatory Drug Testing Program. The regulation can be downloaded from the following website:

http://regulations.delaware.gov/register/september2015/final/19%20DE%20Reg%20207%2009-01-15.pdf

END OF SECTION

SECTION 002113 - INSTRUCTIONS TO BIDDERS

1. DEFINITIONS

A. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement for Bid, Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the Bid Form (including the Non-collusion Statement), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

B. All definitions set forth in the General Conditions and the other Contract Documents are applicable to the Bidding Documents.

C. "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.

D. The term Work is defined in 1.1.3 of the General Conditions.

E. 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 011100 - 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".

F. A "Bid" is a complete and properly executed proposal to do one or more Units of Work for the sum stipulated therein.

G. A "Bidder" is one who submits a Bid to the Bidding Agency for the Unit or Units of Work indicated therein.

H. 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.

I. General Requirements (or Conditions) apply to entire work of Contract and, where so indicated, to other elements which are included in the project.

J. 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" 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.

K. 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.

L. 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.

M. 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.

N. 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.

O. 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.

P. Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

Q. 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.

R. 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

A. 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.

B. 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

A. ISSUANCE

1. The drawings and specifications of preceding bid packages may not be issued with the drawings and specifications of this bid package, but are included by reference in the Table of Contents. Contractors bidding on work in this bid package are responsible for knowing what work has preceded this bid package and how it affects its work. In order to assist contractors in this effort, the contract documents from preceding or simultaneous bid packages will be available for review at the Construction Manager's main office and job site office. Bidding documents will be available on the EDiS FTP site, **bids.ediscompany.com**. It is the responsibility of each Bidder to review and coordinate all Project Documents. This includes plans, specifications and addendums. Bidding documents will be made available to qualified bidders only. Contractors are advised that no change orders will be allowed that are based on ignorance of work assigned in preceding or simultaneous 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.

B. 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.

C. SUBSTITUTIONS

1. Refer to Specification Section 016200 - MATERIAL AND EQUIPMENT.

2. Substitution requests must be made at least seven (7) days prior to the receipt of bids.

D. ADDENDA

1. Addenda will be emailed, mailed, faxed or delivered to each person or firm recorded by the Construction Manager as having received a complete set of the Bidding Documents, and will be available for inspection wherever the Bidding Documents are kept available for that purpose.
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 sent by email, fax or by U.S. Mail to the addresses 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

A. 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.

B. 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 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.

5. The Bidder shall include signed Affidavit(s) for the Bidder and each listed Subcontractor certifying compliance with OMB Regulation 4104- "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on "Large Public Works Projects."

C. 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 NINETY (90) 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

A. OPENING OF BIDS

1. Bid shall be publicly opened and read aloud.

B. 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.

C. 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

A. 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:

A. 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.

B. 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.

C. 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.

D. 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 herby shall be in conflict with subchapter 6904 of this title.

8. PREVAILING WAGE REQUIREMENT

A. 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.

B. 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.

C. 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.

D. 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.

E. 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 "every contract… shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly." Further, that "the 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

A. 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. The Owner is the New Castle County Vocational Technical School District.

B. 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. The Owner is the New Castle County Vocational Technical School District.

C. 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.

2. The performance and payment bonds shall be written in the form found in Section 006113 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

A. The Agreement will be written on a contract form, stipulated by the Owner, a copy of which is included in the Specifications.

B. The Bidder shall, within seven (7) days following its presentation, execute the Agreement and return it to the Construction Manager.

C. 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.

D. The Bidder shall provide two (2) business days prior to contract execution, copies of the Employee Drug Testing Program for the Bidder and all listed Subcontractors.

E. 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 re-advertised, as the Agency may decide.

11. GENERAL COMMENTS

A. 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 with their bid.

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.

B. BUSINESS LICENSES FOR SUBCONTRACTORS

The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses and taxpayer identification number (i.e. federal employer identification number or social security number) of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

C. 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.

D. 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.

E. STATE LICENSE AND TAX REQUIREMENTS

The Contractor and Subcontractor shall be licensed to do business in the State of Delaware & New Castle County 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 . . ."

F. 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.

G. PREFERENCE FOR DELAWARE LABOR

In the construction of all public works for the State or any political subdivision thereof or by firms contracting with the State or any political subdivision thereof, preference in employment of laborers, workers 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 persons, 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.

END OF SECTION

Contract No. HHS-30 Demolition

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-30 Demolition have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-31 Concrete

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

UNIT PRICES

Unit Price No. 1: Cast-in-place concrete slab, on grade or elevated. Unit of measure: Cubic yard of cast-in-place concrete.

Add/Deduct _____($_____)

Unit Price No. 2: Cast-in-place concrete with formwork. Unit of measure: Cubic yard of cast-in-place concrete.

Add/Deduct _____($_____)

Unit Price No. 3: Polished concrete floor finish. Unit of measure: 1,000 square feet of polished concrete floor finish.

Add/Deduct _____($_____)

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-31 Concrete have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-32 Masonry and Masonry Restoration

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

UNIT PRICES

Unit Price No. 4: Cleaning of brick and limestone masonry. Unit of measure: Square food of masonry surface cleaned.

Add/Deduct _____($_____)

Unit Price No. 5: Replace brick. Unit of measure: each brink replaced.

Add/Deduct _____($_____)

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS- HHS-32 Masonry and Masonry Restoration have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-33 Miscellaneous Steel

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

UNIT PRICES

Unit Price No. 6: Provide railing with guard rail, pickets and handrail, as specified in this section. Unit of measure: Per linear foot of railing installed.

Add/Deduct _____($_____)

Unit Price No. 7: Replace in kind the existing railings, guard rails, pickets and handrails at the existing ramp and steps in Room No. 117 – Student Commons. Unit of measure: Lump sum per item installed.

Add/Deduct _____($_____)

Unit Price No. 8: Provide gravity vent grilles. Unit of measure: Per each gravity vent grille installed.

Add/Deduct _____($_____)

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS- HHS-33 Miscellaneous Steel have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-34 Carpentry/Rough and Finish

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS- HHS-34 Carpentry/Rough and Finish have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-35 Metal Framing, Drywall, Plaster

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

UNIT PRICES

Unit Price No. 9: Gypsum plaster patching. Unit of measure: Sq Ft of gypsum plaster patching.

Add/Deduct _____($_____)

Unit Price No. 10: Veneer plaster wall. Unit of measure: Sq Ft veneer plaster wall.

Add/Deduct _____($_____)

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-35 Metal Framing, Drywall, Plaster have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-36 Acoustical Ceilings and Panels

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-36 Acoustical Ceilings and Panels have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-37 Terrazzo Flooring

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

UNIT PRICES

Unit Price No. 11: Epoxy terrazzo logo. Unit of measure: Sq Ft of epoxy terrazzo logo.

Add/Deduct _____($_____)

Unit Price No. 12: Epoxy terrazzo logo. Unit of measure: Sq Ft of epoxy terrazzo logo.

Add/Deduct _____($_____)

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-37 Terrazzo Flooring have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-38 Flooring

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-38 Flooring have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-39 Laminate Casework and Millwork

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-39 Laminate Casework and Millwork have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-40 Roofing, Sheet Metal and Waterproofing

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-40 Roofing, Sheet Metal and Waterproofing have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-41 Ceramic Tile

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-41 Ceramic Tile have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-42 Painting and Coatings

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

UNIT PRICES

Unit Price No. 15: 3-coat painted wall. Unit of measure: Sq Ft of 3-cost painted wall.

Add/Deduct _____($_____)

Unit Price No. 12: 1-coat painted wall. Unit of measure: 1-coast painted wall.

Add/Deduct _____($_____)

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-42 Painting and Coatings have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-43 Window Treatments

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-44 Window Treatments have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-44 Stage Lighting System

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-44 Stage Lighting System have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

Contract No. HHS-45 Wood Flooring

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

_____

Contact Name: _____ E-Mail Address: _____

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

(Other License Nos.): _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

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
N/A

UNIT PRICES

Unit Price No. 15: Wood strip flooring at stage/gymnasium. Unit of measure: Sq Ft of wood strip flooring.

Add/Deduct _____($_____)

Unit Price No. 6 Wood strip flooring at Room No. M019. Unit of measure: Sq Ft of wood strip flooring.

Add/Deduct _____($_____)

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 ninety (90) days 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: _____
(Authorized Signature)

(SEAL) _____
(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(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.**

Subcontractor Category	Subcontractor	Address (City & State)	**Subcontractors tax payer ID # or Delaware Business license #**
1.			

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 No.: HHS-45 Wood Flooring have 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical 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 New Castle County Vocational Technical 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 New Castle County Vocational Technical 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

_____
Name of Surety

Witness_____

_____

_____
Title

CONSENT OF SURETY

DATE_____

To:

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 9 of the Instructions to Bidders.

_____
(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

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.

END OF SECTION

SECTION 005200 - 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, Construction Manager as Advisor, AIA Document A132 - 2009 Edition]

1.2 A copy of AIA Document A132 – 2009 Edition is bound into this Project Manual following this page.

1.2.1 Under Article 5.1.4.5 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

DRAFT

AIA® Document A132™ – 2009

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

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

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

New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, Delaware 19804

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

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

Renovations to Howard High School of Technology

The Construction Manager:
(Name, legal status, address and other information)

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

The Architect:
(Name, legal status, address and other information)

ABHA Architects
1621 North Lincoln Street
Wilmington, Delaware 19806

The Owner and Contractor agree as follows.

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2009, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2009, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

AIA Document A232™–2009 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

10 INSURANCE AND BONDS

EXHIBIT A DETERMINATION OF THE COST OF THE WORK

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.
(Insert the date of commencement, if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

« »

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

« »

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

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than « » (« ») days from the date of commencement, or as follows:
(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

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Per the construction schedule in Section 013216 Construction Schedule in the project manual.

Portion of the Work	Substantial Completion Date

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

« »

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:
(Check the appropriate box.)

[X] Stipulated Sum, in accordance with Section 4.2 below

[« »] Cost of the Work plus the Contractor's Fee without a Guaranteed Maximum Price, in accordance with Section 4.3 below

[« »] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below. Based on the selection above, also complete either Section 5.1.4, 5.1.5 or 5.1.6 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Stipulated Sum shall be « » ($ « »), subject to additions and deletions as provided in the Contract Documents.

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

« »

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

Item	Units and Limitations	Price per Unit ($0.00)

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

Item	Allowance
Miscellaneous Work as Directed by Construction Manager	$10,000

§ 4.3 Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price

§ 4.3.1 The Contract Sum is the Cost of the Work as defined in Exhibit A, Determination of the Cost of the Work, plus the Contractor's Fee.

§ 4.3.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

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« »

§ 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:

« »

§ 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

« »

§ 4.3.5 Rental rates for Contractor-owned equipment shall not exceed « » percent (« » %) of the standard rate paid at the place of the Project.

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3.7 The Contractor shall prepare and submit to the Construction Manager for the Owner, in writing, a Control Estimate within 14 days of executing this Agreement. The Control Estimate shall include the items in Section A.1 of Exhibit A, Determination of the Cost of the Work.

§ 4.4 Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price
§ 4.4.1 The Contract Sum is the Cost of the Work as defined in Exhibit A, Determination of the Cost of the Work, plus the Contractor's Fee.

§ 4.4.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

« »

§ 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:

« »

§ 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

« »

§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed « » percent (« » %) of the standard rate paid at the place of the Project.

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.4.7 Guaranteed Maximum Price
§ 4.4.7.1 The sum of the Cost of the Work and the Contractor's Fee is guaranteed by the Contractor not to exceed « » ($ « »), subject to additions and deductions by changes in the Work as provided in the Contract Documents. Such maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.
(Insert specific provisions if the Contractor is to participate in any savings.)

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« »

§ 4.4.7.2 The Guaranteed Maximum Price is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

« »

§ 4.4.7.3 Allowances included in the Guaranteed Maximum Price, if any:
(Identify and state the amounts of any allowances, and state whether they include labor, materials, or both.)

Item	Allowance

§ 4.4.7.4 Assumptions, if any, on which the Guaranteed Maximum Price is based:

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Construction Manager by the Contractor, and upon certification of the Project Application and Project Certificate for Payment or Application for Payment and Certificate for Payment by the Construction Manager and Architect and issuance by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

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

« »

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 25th day of a month, the Owner shall make payment of the certified amount in the Application for Payment to the Contractor not later than the 5th day of the second 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 forty five (45) days after the Construction Manager receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work and be 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.

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

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

.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the 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 Section 7.3.9 of the General Conditions;

.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

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User Notes: (1129798000)

in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of five percent (5%);

.3 Subtract the aggregate of previous payments made by the Owner; and

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

§ 5.1.4.4 The progress payment amount determined in accordance with Section 5.1.4.3 shall be further modified under the following circumstances:

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

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

§ 5.1.4.5 Reduction or limitation of retainage, if any, shall be as follows:
(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.4.3.1 and 5.1.4.3.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

« »

§ 5.2 Final Payment

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2 of AIA Document A232–2009, and to satisfy other requirements, if any, which extend beyond final payment;

.2 the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit A, Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or without a Guaranteed Maximum payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect; such final payment shall be made by the Owner not more than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment, or as follows:

As described in the contract documents.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A232–2009, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »
« »
« »
« »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A232–2009, the method of binding dispute resolution shall be as follows:
(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

[« »] Arbitration pursuant to Section 15.4 of AIA Document A232–2009.

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[« »] Litigation in a court of competent jurisdiction.

[X] Other: *(Specify)*

Per 007300, "any or all remedies at law or in equity,"

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2009.

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2009.

§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

§ 7.2.1 Subject to the provisions of Section 7.2.2 below, the Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2009.

§ 7.2.2 The Contract may be terminated by the Owner for cause as provided in Article 14 of AIA Document A232–2009; however, the Owner shall then only pay the Contractor an amount calculated as follows:

.1 Take the Cost of the Work incurred by the Contractor to the date of termination;

.2 Add the Contractor's Fee computed upon the Cost of the Work to the date of termination at the rate stated in Sections 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion; and

.3 Subtract the aggregate of previous payments made by the Owner.

§ 7.2.3 If the Owner terminates the Contract for cause when the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, and as provided in Article 14 of AIA Document A232–2009, the amount, if any, to be paid to the Contractor under Section 14.2.4 of AIA Document A232–2009 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.2.

§ 7.2.4 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders.

§ 7.2.5 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2009; in such case, the Contract Sum and Contract Time shall be increased as provided in Section 14.3.2 of AIA Document A232–2009, except that the term 'profit' shall be understood to mean the Contractor's Fee as described in Sections 4.3.2 and 4.4.2 of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2009 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 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.)

« » % « »

§ 8.3 The Owner's representative:

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User Notes: (1129798000)

(Name, address and other information)

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

§ 8.4 The Contractor's representative:
(Name, address and other information)

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

§ 8.6 Other provisions:

« »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

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

§ 9.1.1 The Agreement is this executed AIA Document A132–2009, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition.

§ 9.1.2 The General Conditions are AIA Document A232–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
A232-2009	Supplementary General Conditions		

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

« »

Section	Title	Date	Pages

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

As described in the contract documents.

Number	Title	Date

§ 9.1.6 The Addenda, if any:

Number	Date	Pages

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

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

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Bid Form dated
Letter of Intent dated
State of Delaware Purchase Order

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2009.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A232–2009.)

Type of Insurance or Bond	Limit of Liability or Bond Amount ($0.00)

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

NCC Vocational Technical School District

OWNER *(Signature)*

« »« »

(Printed name and title)

Contractor

CONTRACTOR *(Signature)*

« »« »

(Printed name and title)

DRAFT

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User Notes: (1129798000)

SECTION 006113 – PERFORMANCE AND PAYMENT BONDS

1. PERFORMANCE AND PAYMENT BONDS

1.1 Bonds must be in the following form:

1. Form of Performance Bond (attached).
2. Form of Payment Bond (attached).

SECTION 006113 - FORM OF PAYMENT BOND

Bond Number:

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("Principal"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("Surety"), are held and firmly bound unto the State of Delaware, New Castle County Vocational Technical School District ("Owner"), in the amount of _____ ($_____), to be paid to Owner, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

Sealed with our seals and dated this _____ day of_____, 20____.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, who has been awarded by Owner that certain contract known as Contract No. _____dated the _____ day of _____, 20__ (the "Contract"), which Contract is incorporated herein by reference, shall well and truly pay all and every person furnishing materials or performing labor or service in and about the performance of the work under the Contract, all and every sums of money due him. her, them or any of them, for all such materials, labor and service for which Principal is liable, shall make good and reimburse Owner sufficient funds to pay such costs in the completion of the Contract as Owner may sustain by reason of any failure or default on the part of Principal, and shall also indemnity and save harmless Owner from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of Surety and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and Surety hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to Surety as though done or omitted to be done by or in relation to Principal.

Surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of Surety and its bond. Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to Surety or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, Principal and Surety have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

Witness or Attest: PRINCIPAL

By: _____ _____

Name: _____

Title: _____

(Corporate Seal)

Witness or Attest: SURETY

By: _____ _____

Name: _____

Title: _____

(Corporate Seal)

SECTION 006113 - FORM OF PERFORMANCE BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("Principal"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("Surety"), are held and firmly bound unto the State of Delaware, New Castle County Vocational Technical School District ("Owner"), in the amount of_____ ($_____) to be paid to Owner, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns. jointly and severally, for and in the whole, firmly by these presents.

Sealed with our seals and dated this _____ day of _____, 20_____.

NOW THE CONDITION OF THIS OBLICATION IS SUCH, that if Principal, who has been awarded by Owner that certain contract known as Contract No. _____ dated the _____ day of _____, 20 (the "Contract"), which Contract is incorporated herein by reference, shall well and truly provide and furnish all materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and the Contract Documents (as defined in the Contract) or any changes or modifications thereto made as therein provided, shall make good and reimburse Owner sufficient funds to pay the costs of completing the Contract that Owner may sustain by reason of any failure or default on the part of Principal, and shall also indemnify and save harmless Owner from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, hereby stipulates and agrees, if requested to do so by Owner, to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof, if for any cause Principal fails or neglects to so fully perform and complete such work

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of Surety and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and Surety hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to Surety as though done or omitted to be done by or in relation to Principal.

Surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of Surety and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to Surety or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, Principal and Surety have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

Witness or Attest: PRINCIPAL

By: _____ _____

Name: _____

Title: _____

(Corporate Seal)

Witness or Attest: SURETY

By: _____ _____

Name: _____

Title: _____

(Corporate Seal)

END OF SECTION

SECTION 006216 – 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 Pack). The Contractor shall use the standard "ACORD" for titled "Certificate of Insurance" in submitting his liability insurance limits. The required limits to be inserted in accordance with the sample "ACORD" form in this section:

GENERAL NOTES

1. Other Insurance

   A. 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 "ACORD" form Certificate of Insurance:

   A. Name and Address of Insured (Contractor).
   B. Description of Operations/Locations -

3. Added Insured – NCC Vocational Technical School District and EDiS Company

4. Certificate Holder – New Castle County Vocational Technical School District
   1417 Newport Road
   Wilmington, Delaware 19804

Contractors shall note that although not a part of AIA Document A232 - 2009 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

MAKE FILE

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.

INSURERD

SAMPLE SUBCONTRACTOR CERTIFICATE
(REQUIRED MINIMUM INSURANCE)

INSURERS AFFORDING COVERAGE

INSURER A: XXXXXX
INSURED 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 X COMMERCIAL GENERAL LIABILITY CLAIMS MADE / X OCCUR GENL AGGREGATE LIMIT APPLIES PER: POLICY / X PRO-JECT / LOC	XXXXXXXXXXXXXXX	XXXXXXXX	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 X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIREDAUTOS X NON-OWNED AUTOS	XXXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXXX	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
					BODILY INJURY (Per person)	$
					BODILY INJURY (Per accident)	$
					PROPERTY DAMAGE (Per accident)	$
	GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT	$
					OTHER THAN: AUTO ONLY: EA ACC	$
					AGG	$
	EXCESS LIABILITY X OCCUR / CLAIMS MADE DEDUCTIBLE RETENTION $	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXX	EACH OCCURRENCE	$ 5,000,000
					AGGREGATE	$ 5,000,000
						$
						$
						$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	XXXXXXXXXXXXXXX	XXXXXXXXXXX	XXXXXXXXXX	X WC STATU-TORY LIMITS / OTH-ER	$
					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: Renovations to Howard High School of Technology - New Castle County Vocational Technical School District and EDiS Company shall be named as Additional Insureds 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 X **ADDITIONAL INSURED; INSURER LETTER:** ——— **CANCELLATION**

New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

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

© ACORD CORPORATION 1988

SECTION 007200 – GENERAL CONDITIONS

1. SUMMARY

A. The General Conditions for this Project are the American Institute of Architects General Conditions of the Contract for Construction, Construction Manager as Advisor Edition, AIA Document A232 - 2009 Edition.

B. A copy of AIA Document A232 - 2009 Edition is bound into this Project Manual following this page.

END OF SECTION

AIA® Document A232™ – 2009

General Conditions of the Contract for Construction, *Construction Manager as Adviser Edition*

for the following PROJECT:
(Name, and location or address)

Renovations to Howard High School of Technology
401 East 12th Street
Wilmington, Delaware 19801

THE CONSTRUCTION MANAGER:
(Name, legal status and address)

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

THE OWNER:
(Name, legal status and address)

New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, Delaware 19801

THE ARCHITECT:
(Name, legal status and address)

ABHA Architects
1621 North 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.

This document is intended to be used in conjunction with AIA Documents A132™–2009, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2009, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2009, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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(1765370473)

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 OWNER

3 CONTRACTOR

4 ARCHITECT AND CONSTRUCTION MANAGER

5 SUBCONTRACTORS

6 CONSTRUCTION BY OWNER OR BY OTHER CONTRACTORS

7 CHANGES IN THE WORK

8 TIME

9 PAYMENTS AND COMPLETION

10 PROTECTION OF PERSONS AND PROPERTY

11 INSURANCE AND BONDS

12 UNCOVERING AND CORRECTION OF WORK

13 MISCELLANEOUS PROVISIONS

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES

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User Notes:

INDEX

(Topics and numbers in bold are section headings.)

Acceptance of Nonconforming Work
9.6.6, 9.9.3, **12.3**
Acceptance of Work
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3
Access to Work
3.16, 6.2.1, 12.1
Accident Prevention
10
Acts and Omissions
3.2.1, 3.2.2, 3.3.2, 3.12.8, 3.18, 8.3.1, 9.5.1, 10.1, 10.2.5, 13.4.2, 13.7
Addenda
1.1.1, 3.11, 4.2.14
Additional Costs, Claims for
3.2.4, 3.7.4, 3.7.5, 6.1.1, 7.3, 9.10.3, 9.10.4, 10.3, 10.4, 15.1.4
Additional Inspections and Testing
4.2.8, 12.2.1, 13.5
Additional Insured
11.1.4
Additional Time, Claims for
3.7.4, 3.7.5, 6.1.1, 7.3, 8.3, 10.3
Administration of the Contract
3.10, **4.2**
Advertisement or Invitation to Bid
1.1.1
Aesthetic Effect
4.2.19
Allowances
3.8, 7.3.8
All-risk Insurance
11.3.1, 11.3.1.1
Applications for Payment
4.2.7, 4.2.15, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.7, 9.8.3, 9.10.1, 9.10.3, 9.10.5, 11.1.3, 14.2.4
Approvals
2.1.1, 2.2.2, 2.4, 3.1.4, 3.10.1, 3.10.2, 3.12.4 through 3.12.10, 3.13.2, 3.15.2, 4.2.9, 9.3.2, 13.4.2, 13.5
Arbitration
8.3.1, 11.3.10, 13.1, 15.3.2, **15.4**
ARCHITECT
4
Architect, Certificates for Payment
9.4
Architect, Definition of
4.1.1
Architect, Extent of Authority
5.2, 7.1.2, 7.3.7, 7.4, 9.3.1, 9.4, 9.5, 9.8.3, 9.8.4, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.5.1, 13.5.2, 15.1.3, 15.2.1
Architect, Limitations of Authority and Responsibility
2.1.1, 3.12.8, 4.2.1, 4.2.2, 4.2.8, 4.2.13, 5.2.1, 9.6.4, 15.2
Architect's Additional Services and Expenses
2.4, 11.3.1.1, 12.2.1, 12.2.4, 13.5.2
Architect's Administration of the Contract
4.2, 9.4, 9.5, 15.2
Architect's Approvals
3.12.8
Architect's Authority to Reject Work
4.2.8, 12.1.2, 12.2.1
Architect's Copyright
1.5
Architect's Decisions
4.2.8, 7.3.9, 7.4, 8.1.3, 8.3.1, 9.2, 9.4, 9.5, 9.8.3, 9.9.2, 13.5.2, 14.2.2, 14.2.4, 15.2
Architect's Inspections
3.7.4, 4.2, 9.8.3, 9.9.2, 9.10.1, 13.5
Architect's Instructions
3.2.4, 7.4, 9.4
Architect's Interpretations
4.2.8, 4.2.17, 4.2.18
Architect's On-Site Observations
4.2.2, 9.4, 9.5.1, 9.10.1, 12.1.1, 12.1.2, 13.5
Architect's Project Representative
4.2.16
Architect's Relationship with Contractor
1.1.2, 1.5, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.9.2, 3.9.3, 3.10, 3.11, 3.12.8, 3.16, 3.18, 4.2, 5.2, 6.2.2, 8.2, 11.3.7, 12.1, 13.5
Architect's Relationship with Construction Manager
1.1.2, 9.3 through 9.10, 10.3, 13.5.1, 10.3, 11.3.7, 13.4.2, 13.5.4
Architect's Relationship with Subcontractors
1.1.2, 4.2.8, 5.3, 9.6.3, 9.6.4
Architect's Representations
9.4, 9.5, 9.10.1
Architect's Site Visits
4.2.2, 9.4, 9.5.1, 9.8.3, 9.9.2, 9.10.1, 13.5
Asbestos
10.3.1
Attorneys' Fees
3.18.1, 9.10.2, 10.3.3
Award of Other Contracts
6.1.1, 6.1.2
Award of Subcontracts and Other Contracts for Portions of the Work
5.2
Basic Definitions
1.1
Bidding Requirements
1.1.1, 5.2.1, 11.4.1

Init.
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User Notes:

Binding Dispute Resolution
9.7, 11.3.9, 11.3.10, 13.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.4.1
Boiler and Machinery Insurance
11.3.2
BONDS, INSURANCE AND
11
Bonds, Lien
7.3.7.4, 9.10.3
Bonds, Performance and Payment
7.3.7.4, 9.6.7, 9.10.3, 11.3.9, 11.4
Building Permit
2.2.2, 3.7.1
Capitalization
1.3
Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5
Certificates for Payment
4.2.2, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 15.1.3
Certificates of Inspection, Testing or Approval
13.5.4
Certificates of Insurance
9.3.2, 9.10.2, 11.1.3
Change Orders
1.1.1, 2.4, 3.4.2, 3.7.4, 3.8.2, 3.11, 3.12.8, 4.2.12, 4.2.13, 4.2.14, 5.2.3, 7.1.1, 7.1.2, **7.2**, 7.3.2, 7.3.4, 7.3.6, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.3.1.2, 11.3.4, 11.3.9, 12.1.2, 15.1.3
Change Orders, Definition of
7.2
Changes
7.1
CHANGES IN THE WORK
2.2.1, 3.4.2, 3.11, 3.12.8, 4.2.13, 4.2.14, **7**, 8.3.1, 9.3.1.1
Claims, Definition of
15.1.1
CLAIMS AND DISPUTES
1.1.8, 3.2.4, 3.7.5, 6.1.1, 7.3.9, 8.3.2, 9.3.3, 9.10.3, 9.10.4, 10.3.3, **15**, 15.4
Claims for Additional Cost
3.2.4, 3.7.5, 6.1.1, 7.3.9, 9.10.3, 9.10.4, 10.3.2, 10.4, **15.1**.4
Claims for Additional Time
3.2.4, 3.7.5, 7, 8.3.2, 10.4, **15.1.5**
Concealed or Unknown Conditions, Claims for
3.7
Claims for Damages
3.2.4, 3.18, 6.1.1, 6.2.5, 8.3.2, 9.3.3, 9.5.1.2, 9.10.2, 9.10.5, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 15.1.6
Cleaning Up
3.15, 6.3
Commencement of Statutory Limitation Period
13.7
Commencement of the Work, Definition of
8.1.2
Communications, Owner to Architect
2.2.6
Communications, Owner to Construction Manager
2.2.6
Communications, Owner to Contractor
2.2.6
Communications Facilitating Contract Administration
3.9.1, **4.2.6**
COMPLETION, PAYMENTS AND
9
Completion, Substantial
4.2.15, 8.1.1, 8.1.3, 8.2.3, 9.4.3.3, **9.8**, 9.9.1, 9.10.3, 12.2.1, 12.2.2, 13.7
Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3
Conditions of the Contract
1.1.1
Consolidation or Joinder
15.4.4
CONSTRUCTION BY OWNER OR BY OTHER CONTRACTORS
1.1.4, **6**
Construction Change Directive, Definition of
7.3.1
Construction Change Directives
1.1.1, 3.4.2, 3.12.8, 4.2.12, 4.2.13, 7.1.1, 7.1.2, 7.1.3, **7.3**, 9.3.1.1
Construction Manager, Building Permits
2.2.2
Construction Manager, Communications through
4.2.6
Construction Manager, Construction Schedule
3.10.1, 3.10.3
CONSTRUCTION MANAGER
4
Construction Manager, Definition of
4.1.2
Construction Manager, Documents and Samples at the Site
3.11
Construction Manager, Extent of Authority
3.12.7, 3.12.8, 4.1.3, 4.2.1, 4.2.4, 4.2.5, 4.2.9, 7.1.2, 7.2, 7.3.1, 8.3, 9.3.1, 9.4.1, 9.4.2, 9.4.3, 9.8.2, 9.8.3, 9.8.4, 9.9.1, 12.1, 12.2.1, 14.2.2, 14.2.4
Construction Manager, Limitations of Authority and Responsibility
4.2.5, 4.2.8, 13.4.2
Construction Manager, Submittals
4.2.9
Construction Manager's Additional Services and Expenses
12.2.1
Construction Manager's Administration of the Contract
4.2, 9.4, 9.5

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(1765370473)

Construction Manager's Approval
2.4, 3.10.1, 3.10.2
Construction Manager's Authority to Reject Work
4.2.8, 12.2.1
Construction Manager's Decisions
7.3.7, 7.3.9, 9.4.1, 9.5.1
Construction Manager's Inspections
4.2.8, 9.8.3, 9.9.2
Construction Manager's On-Site Observations
9.5.1
Construction Manager's Relationship with Architect
1.1.2, 4.2.1, 4.2.7, 4.2.8, 4.2.9, 4.2.13, 4.2.15, 4.2.16, 4.2.20, 9.2.1, 9.4.2, 9.5, 9.6.1, 9.6.3, 9.8.2, 9.8.3, 9.8.4, 9.9.1, 9.10.1, 9.10.2, 9.10.3, 11.1.3, 12.2.4, 13.5.1, 13.5.2, 13.5.4, 14.2.2, 14.2.4
Construction Manager's Relationship with Contractor
3.2.2, 3.2.3, 3.3.1, 3.5, 3.10.1, 3.10.2, 3.10.3, 3.11, 3.12.5, 3.12.6, 3.12.7, 3.12.8, 3.12.9, 3.12.10, 3.13.2, 3.14.2, 3.15.2, 3.16, 3.17, 3.18.1, 4.2.4, 4.2.5, 4.2.6, 4.2.9, 4.2.14, 4.2.17, 4.2.20, 5.2, 6.2.1, 6.2.2, 7.1.2, 7.2, 7.3.5, 7.3.7, 7.3.10, 8.3.1, 9.2, 9.3.1, 9.4.1, 9.4.2, 9.7, 9.8.2, 9.8.3, 9.8.4, 9.9.1, 9.10.1, 9.10.2, 9.10.3, 10.1, 10.3, 11.3.7, 12.1, 13.5.1, 13.5.2, 13.5.3, 13.5.4
Construction Manager's Relationship with Owner
2.2.2, 4.2.1, 10.3.2
Construction Manager's Relationship with Other Contractors and Owner's Own Forces
4.2.4
Construction Manager's Relationship with Subcontractors
4.2.8, 5.3, 9.6.3, 9.6.4
Construction Manager's Site Visits
9.5.1
Construction Schedules, Contractor's
3.10, 3.12.1, 3.12.2, 6.1.2, 15.1.5.2
Contingent Assignment of Subcontracts
5.4, 14.2.2.2
Continuing Contract Performance
15.1.3
Contract, Definition of
1.1.2
CONTRACT, TERMINATION OR SUSPENSION OF THE
5.4.1.1, 11.3.9, **14**
Contract Administration
3.1.3, 4.2, 9.4, 9.5
Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1, 11.1.3, 11.3.6, 11.4.1
Contract Documents, Copies Furnished and Use of
1.5.2, 2.2.5, 5.3
Contract Documents, Definition of
1.1.1
Contract Performance During Arbitration
15.1.3
Contract Sum
3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.2, 7.3, 7.4, **9.1,** 9.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.3.1.1, 12.3, 14.2.4, 14.3.2, 15.1.4, 15.2.5
Contract Time
3.7.4, 3.7.5, 4, 3.10.2, 5.2.3, 7.2.3, 7.3.1, 7.3.5, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 14.3.2, 15.1.5.1, 15.2.5
Contract Time, Definition of
8.1.1
CONTRACTOR
3
Contractor, Definition of
3.1.1
Contractor's Construction Schedules
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
Contractor's Employees
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1
Contractor's Liability Insurance
11.1
Contractor's Relationship with Other Contractors and Owner's Own Forces
3.12.5, 3.14.2, 4.2.6, 6, 11.3, 12.1.2, 12.2.4
Contractor's Relationship with Subcontractors
1.2.2, 3.3.2, 3.18, 5, 9.6.2, 9.6.7, 9.10.2, 11.3.1.2, 11.3.7, 11.3.8, 14.2.1.2
Contractor's Relationship with the Architect
1.1.2, 1.5, 3.2.2, 3.2.3, 3.2.4, 3.4.2, 3.5, 3.7.4, 3.10.1, 3.11, 3.12, 3.16, 3.18, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.5, 15.1.2, 15.2.1
Contractor's Relationship with the Construction Manager
1.1.2, 3.2.2, 3.2.3, 3.3.1, 3.5, 3.10.1, 3.10.2, 3.10.3, 3.11, 3.12.5, 3.12.7, 3.12.9, 3.12.10, 3.13.2, 3.14.2, 3.15.1, 3.16, 3.17, 3.18.1, 4.2.4, 4.2.5, 5.2, 6.2.1, 6.2.2, 7.1.2, 7.3.5, 7.3.7, 7.3.10, 8.3.1, 9.2, 9.3.1, 9.4.1, 9.4.2, 9.8.2, 9.9.1, 9.10.1, 9.10.2, 9.10.3, 10.1, 10.2.6, 10.3, 11.3.7, 12.1, 13.5.1, 13.5.2, 13.5.3, 13.5.4
Contractor's Representations
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor's Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor's Review of Contract Documents
3.2
Contractor's Right to Stop the Work
9.7
Contractor's Right to Terminate the Contract
14.1
Contractor's Submittals
3.10.2, 3.11, 3.12, 4.2.9, 9.2, 9.3, 9.8.2, 9.9.1, 9.10.2, 9.10.3, 11.1.3, 11.4.2
Contractor's Superintendent
3.9, 10.2.6

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Contractor's Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 4.2.5, 4.2.7, 6.1, 6.2.4, 7.1.3, 7.3.5, 7.3.7, 8.2, 10, 12, 14, 15.1.3
Contractual Liability Insurance
11.1.1.8, 11.2, 11.3.1.5
Coordination and Correlation
1.2, 3.2, 3.3.1, 3.10, 3.12.6, 6.1.2, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 2.2.5, 3.11
Copyrights
1.5, 3.17
Correction of Work
2.3, 2.4, 9.4.1, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, **12.2**
Correlation and Intent of the Contract Documents
1.2
Costs
2.4, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.6, 7.3.7, 7.3.8, 7.3.9, 11.3.1.2, 11.3.1.3, 11.3.4, 11.3.9, 12.1, 12.2.1, 13.5, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Other Contractors
3.14.2, 6.2.4, 9.5.1.5, 10.2.1.2, 10.2.5, 10.4, 11.1.1, 11.3, 12.2.4
Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 11.3.1, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.2, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 14.2.4, 15.1.6
Damages for Delay
6.1.1, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 15.1.5
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Architect
3.7.4, 4.2.7, 4.2.8, 4.2.10, 4.2.11, 4.2.13, 4.2.15, 4.2.16, 4.2.17, 4.2.18, 4.2.19, 4.2.20, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5, 9.8.3, 9.8.4, 9.9.1, 10.1.2, 13.5.2, 14.2.2, 14.2.4, 15.1, 15.2
Decisions of the Construction Manager
7.3.7, 7.3.8, 7.3.9, 15.1, 15.2
Decisions to Withhold Certification
9.4.1, **9.5**, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance, Rejection and Correction of
2.3, 2.4, 3.5, 4.2.8, 6.2.5, 9.5.1, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1, 12.2.2
Definitions
1.1, 2.1.1, 3.1.1, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 4.1.2, 7.2, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1
Delays and Extensions of Time
3.2, 3.7.4, 5.2.3, 7.2, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.5, 15.2.5
Disputes
7.3.8, 7.3.9, 9.3, 15.1, 15.2
DISPUTES, CLAIMS AND
3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, **15**, 15.4
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Ownership and Use
1.1.1, **1.5**, 2.2.5, 3.11, 5.3
Duty to Review Contract Documents and Field Conditions
3.2
Effective Date of Insurance
8.2.2, 11.1.2
Emergencies
10.4, 14.1.1.2, 15.1.4
Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.1, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1
Equipment, Labor, Materials and or
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12.2, 3.12.3, 3.13.1, 3.15.1, 4.2.8, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.2.3, 2.2.5, 3.1, 3.3.1, 3.4.1, 3.5, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.5, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.2, 14.2, 14.3.1, 15.1.3
Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.3, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4, 14.3, 15.1.5, 15.2.5
Failure of Payment
9.5.1.3, **9.7**, 13.6, 14.1.1.3, 14.1.3, 14.2.1.2, 15.1.4
Faulty Work (See Defective or Nonconforming Work)
Final Completion and Final Payment
4.2.1, 4.2.15, 9.8.2, **9.10**, 11.1.2, 11.1.3, 11.3.1, 11.3.5, 12.3, 15.2.1
Financial Arrangements, Owner's
2.2.1
GENERAL PROVISIONS
1
Governing Law
13.1
Guarantees (See Warranty and Warranties)
Hazardous Materials
10.2.4, **10.3**
Identification of Contract Documents
1.2.1
Identification of Subcontractors and Suppliers
5.2.1
Indemnification
3.18, 9.10.2, 10.3.3, 10.3.5, 10.3.6, 11.3.1.2, 11.3.7

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Information and Services Required of the Owner
2.1.2, **2.2**, 4.2.6, 6.1.2, 6.2.5, 9.6.1, 9.6.4, 9.8, 9.9.1, 9.10.3, 10.3.2, 10.3.3, 11.2, 11.3.4, 13.5.1, 13.5.2, 14.1.1.4, 14.1.3, 15.1.2
Initial Decision
15.2
Initial Decision Maker, Definition of
1.1.8
Initial Decision Maker, Extent of Authority
14.2.2, 14.2.4, 15.1.3, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Injury or Damage to Person or Property
3.18.1, 10.2.1, 10.2.2, **10.2.8**, 10.3, 10.3.3, 10.4, 11.1.1
Inspections
3.1.3, 3.7.1, 4.2.2, 9.8.2, 9.9.2, 9.10.1, 13.5
Instructions to Bidders
1.1.1
Instructions to the Contractor
3.1.4, 3.3.3, 3.7.1, 4.2.4, 5.2.1, 7, 8.2.2, 12.1, 13.5.2
Instruments of Service, Definition of
1.1.7, 1.5, 1.6
Insurance
6.1.1, 7.3.7, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5, 11
Insurance, Boiler and Machinery
11.3.2
Insurance, Contractor's Liability
11.1
Insurance, Effective Date of
8.2.2, 11.1.2
Insurance, Loss of Use
11.3.3
Insurance, Owner's Liability
11.2
Insurance, Property
10.2.5, **11.3**
Insurance, Stored Materials
9.3.2, 11.3.1
INSURANCE AND BONDS
11
Insurance Companies, Consent to Partial Occupancy
9.9.1, 11.3.1.5
Insurance Companies, Settlement with
11.3.10
Intent of the Contract Documents
1.2, 4.2.18, 4.2.19, 7.4
Interest
9.7, **13.6**
Interpretation
1.4, 4.2.8, 4.2.17, 4.2.18
Interpretations, Written
4.2.17, 4.2.18, 4.2.20
Joinder and Consolidation of Claims Required
15.4.4
Judgment on Final Award
15.4.2
Labor and Materials, Equipment
1.1.3, 1.1.6, 3.4, 3.8.2, 3.8.3, 3.12.2, 3.12.3, 3.12.6, 3.12.10, 3.13.1, 3.15.1, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.6, 9.10.2, 10.2.1.2, 11.3.1, 14.2.1, 14.2.2
Labor Disputes
8.3.1
Laws and Regulations
3.2.3, 3.2.4, 3.7, 3.13.1, 10.2.2, 10.2.3, 13.5.1, 14.2.1
Liens
2.1.2, 9.3.3, 9.10.2, 9.10.4, 15.2.8
Limitation on Consolidation or Joinder
15.4.4
Limitations, Statutes of
15.4.1
Limitations of Authority
3.12.4, 4.1.3, 4.2.16
Limitations of Liability
9.6.7, 11.1.1, 12.2
Limitations of Time
3.10.1, 4.2.17, 4.2.20, 8.2.1, 9.3.3, 9.6.1, 9.8.4, 9.10.2, 10.2, 11.1.3, 12.1.1, 12.2.2.2, 12.2.5, 13.7, 14.1.1, 15.2.6.1
Loss of Use Insurance
11.3.3
Material Suppliers
1.5.1, 1.5.2, 3.12, 4.2.6, 4.2.8, 9.3.1, 9.3.1.2, 9.3.3, 9.5.3, 9.6.4, 9.6.5, 9.6.7, 9.10.5, 11.3.1
Materials, Hazardous
10.2.4, **10.3**
Materials, Labor, Equipment and
1.1.3, 1.1.6, 1.5.1, 1.5.2, 3.4, 3.5, 3.8.2, 3.8.3, 3.12.2, 3.12.3, 3.12.6, 3.12.10, 3.13.1, 5.2.1, 6.2.1, 9.3.1, 9.3.2, 9.3.3, 9.5.1, 9.5.3, 9.6.4, 9.6.5, 9.6.7, 9.10.2, 9.10.5, 10.2.1, 10.2.4, 10.3
Means, Methods, Techniques, Sequences and Procedures of Construction
3.3.1, 3.12.10, 4.2.5, 4.2.11
Mechanic's Lien
2.1.2, 15.2.8
Mediation
8.3.1, 10.3.5, 15.2.1, 15.2.5, 15.2.6, **15.3**, 15.4.1
Minor Changes in the Work
1.1.1, 3.12.8, 4.2.13, 7.1, **7.4**
MISCELLANEOUS PROVISIONS
13
Modifications, Definition of
1.1.1
Modifications to the Contract
1.1.1, 1.1.2, 3.11, 4.1.3, 4.2.14, 5.2.3, 7, 11.3.1
Mutual Responsibility
6.2
Nonconforming Work, Acceptance of
9.4.3, 9.8.3, **12.3**
Nonconforming Work, Rejection and Correction of
2.3, 2.4, 3.2.3, 3.7.3, 9.4.3.3, 9.8.2, 9.8.3, 9.9.1, 11.1.1, 12.2.2.1, 12.2.3, 12.2.4, 12.2.5

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Notice
1.5, 2.1.2, 2.2.1, 2.4, 3.2.4, 3.3.1, 3.7.1, 3.7.2, 3.7.5, 3.9.2, 3.12.9, 5.2.1, 6.3, 9.4.1, 9.7, 9.10.1, 9.10.2, 10.2.2, 10.2.6, 10.2.8, 10.3.2, 11.3.6, 12.2.2.1, 13.3, 13.5.1, 13.5.2, 14.1.2, 14.2.2, 14.4.2, 15.1.2, 15.1.4, 15.1.5.1, 15.2, 15.4.1
Notice of Claims
3.7.2, 10.2.8, **15.1.2**, 15.4.1
Notice of Testing and Inspections
13.5.1, 13.5.2
Notiees, Permits, Fees and
3.7, 7.3.7, 10.2.2
Observations, On-Site
3.2.1, 9.5.1, 12.1.1
Occupancy
2.2.2, 9.6.6, 9.9, 11.3.1.5
On-Site Inspections
4.2.2, 9.10.1, 9.4.4, 9.5.1
Orders, Written
4.2.7, 4.2.18, 4.2.20
Other Contracts and Contractors
1.1.4, 3.14.2, 4.2.9, 6, 11.3.7, 12.1.2
OWNER
2
Owner, Definition of
2.1.1
Owner, Information and Services Required of the
2.1.2, **2.2**, 4.2, 6.1.2, 6.1.3, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.2, 10.3.3, 11.2, 11.3, 13.5.1, 13.5.2, 14.1.1, 14.1.3, 15.1.3
Owner's Authority
1.5, 2.1.1, 2.3, 2.4, 3.4.2, 3.12.10, 3.14.2, 4.1.2, 4.1.3, 4.2.8, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2, 7.3.1, 8.2.2, 9.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.3.3, 11.3.10, 12.2.2.1, 12.3, 13.5.2, 14.2, 14.3.1, 14.4, 15.2.7
Owner's Financial Capability
2.2.1, 13.2.2, 14.1.1
Owner's Liability Insurance
11.2
Owner's Relationship with Subcontractors
1.1.2, 5.2.1, 5.3, 5.4.1, 9.6.4, 9.10.2, 14.2.2
Owner's Right to Carry Out the Work
2.4, 12.2.4, 14.2.2
Owner's Right to Clean Up
6.3
Owner's Right to Perform Construction with Own Forces and to Award Other Contracts
6.1
Owner's Right to Stop the Work
2.3
Owner's Right to Suspend the Work
14.3
Owner's Right to Terminate the Contract
14.2
Ownership and Use of Drawings, Specifications and Other Instruments of Service
1.1.1, 1.1.5, **1.5**, 1.6, 3.11, 3.12.10, 3.17, 4.2.14, 4.2.18, 4.2.20
Partial Occupancy or Use
9.9, 11.3.1.5
Patching, Cutting and
3.14, 6.2.5
Patents and Copyrights, Royalties
3.17
Payment, Applications for
4.2.1, 4.2.7, 4.2.15, 7.3.9, 9.2, **9.3**, 9.4, 9.5, 9.7, 9.10.1, 9.10.3, 9.10.5, 11.1.3
Payment, Certificates for
4.2.15, 7.3.9, 9.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 15.1.3
Payment, Failure of
9.4.1, 9.5, **9.7**, 14.1.1.3
Payment, Final
4.2.1, 9.8.2, **9.10**, 11.1.2, 11.3.1, 11.3.5, 12.3, 15.2.1
Payment Bond, Performance Bond and
5.4.1, 7.3.7, 9.6.7, 9.10.2, 9.10.3, 11, **11.4**
Payments, Progress
9.3.1, 9.4.2, **9.6**
PAYMENTS AND COMPLETION
9, 14
Payments to Subcontractors
5.4.2, 9.3, 9.5.1.3, 9.5.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 9.10.5, 14.2.1.2
PCB
10.3.1
Performance Bond and Payment Bond
5.4.1, 7.3.7, 9.6.7, 9.10.2, 9.10.3, 11, **11.4**
Permits, Fees, Notices and Compliance with Laws
2.2.2, **3.7**, 7.3.7.4, 10.2.2
PERSONS AND PROPERTY, PROTECTION OF
10
Polychlorinated Biphenyl
10.3.1
Product Data, Definition of
3.12.2
Product Data and Samples, Shop Drawings
3.11, **3.12**, 4.2.9, 4.2.10, 4.2.14
Progress and Completion
8.2, 9.3.1, 9.4.2, 9.6, 9.8, 9.10, 14.2.4, 15.1.6
Progress Payments
9.3.1, 9.4.2, **9.6**
Project, Definition of
1.1.4
Project Representatives
4.2.16
Property Insurance
10.2.5, **11.3**
Project Schedule
3.10.1, 3.10.3, 3.10.4, 4.2.2, 4.2.3, 4.2.4

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User Notes:

PROTECTION OF PERSONS AND PROPERTY
10
Regulations and Laws
1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 9.9.1, 10.2.2, 11.1, 11.4, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14.1.1, 14.2.1, 15.2.8, 15.4
Rejection of Work
3.5, 4.2.8, 12.2.1
Releases of and Waivers and of Liens
9.10.2
Representations
1.3, 2.2.1, 3.5, 3.12, 6.2.2, 8.2.1, 9.3.3, 9.4.3, 9.5.1, 9.8.2, 9.10.1
Representatives
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.1, 4.2.2, 4.2.10, 5.1.1, 5.1.2, 13.2.1
Requests for Information
4.2.20
Resolution of Claims and Disputes
15
Responsibility for Those Performing the Work
3.3.2, 3.7.3, 3.12.8, 3.18, 4.2.2, 4.2.5, 4.2.8, 5.3, 6.1.2, 6.2, 6.3, 9.5.1, 9.8.2, 10
Retainage
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor
1.2.2, **3.2**, 3.7.3, 3.12.7
Review of Contractor's Submittals by Owner, Construction Manager and Architect
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 5.2, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples by Contractor
3.12.5
Rights and Remedies
1.1.2, 2.3, 2.4, 3.7.4, 3.15.2, 4.2.8, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.2, 12.2.4, **13.4**, 14, 15.4
Royalties, Patents and Copyrights
3.17
Rules and Notices for Arbitration
15.4
Safety of Persons and Property
10.2, 10.3, 10.4
Safety Precautions and Programs
3.3.1, 3.12, 4.2.5, 5.3, **10.1**, 10.2, 10.3, 10.4
Samples, Definition of
3.12.3
Samples, Shop Drawings, Product Data and
3.11, **3.12**, 4.2.9, 4.2.10
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
3.10, 3.12.1, 3.12.2, 6.1.2, 15.1.5.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.6, 4.2.11, 6, 8.3.1, 12.1.2
Shop Drawings, Definition of
3.12.1
Shop Drawings, Product Data and Samples
3.11, **3.12**, 4.2.9, 4.2.10, 4.2.14
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2.2, 4.2.3, 4.2.15, 9.4.3.3, 9.8.3, 9.9.2, 9.10.1, 13.5
Site Visits, Architect's
3.7.4, 4.2.2, 4.2.15, 9.8.3, 9.9.2, 9.10.1, 13.5
Special Inspections and Testing
4.2.8, 12.2.1, 13.5
Specifications, Definition of
1.1.6
Specifications
1.1.1, **1.1.6**, 1.2.2, 1.5, 3.11, 3.12.10, 3.17, 4.2.14
Staffing Plan
4.2.3
Statute of Limitations
12.2.5, 13.7, 15.4.1.1
Stopping the Work
2.3, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 4.2.5, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7
Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6.2, 9.6.3, 9.10, 10.2.1, 14.1, 14.2
Submittals
3.2.3, 3.10, 3.11, 3.12, 4.2.9, 4.2.10, 4.2.11, 5.2.1, 5.2.3, 7.3.7, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3, 11.1.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.9, 4.2.10
Subrogation, Waivers of
6.1.1, **11.3.7**
Substantial Completion
8.1.1, 8.1.3, 8.2.3, 9.4.3.3, **9.8**, 9.9.1, 9.10.3, 12.2.1, 12.2.2, 13.7
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
4.1.4
Substitution of Construction Manager
4.1.4
Substitutions of Materials
3.4.2, 3.5, 7.3.8

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User Notes:

Sub-subcontractor, Definition of
5.1.2
Subsurface Conditions
3.7.4
Successors and Assigns
13.2
Superintendent
3.9, 10.2.6
Supervision and Construction Procedures
1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.3, 4.2.5, 4.2.8, 4.2.9, 4.2.10, 4.2.11, 6.1.3, 6.2.4, 7.1.3, 7.3.7, 8.2, 8.3.1, 9.4.3.3, 10, 12, 14, 15.1.3
Surety
5.4.1.2, 9.8.5, 9.10.2, 9.10.3, 14.2.2, 15.2.7
Surety, Consent of
9.10.2, 9.10.3
Surveys
1.1.7, 2.2.3
Suspension by the Owner for Convenience
14.3
Suspension of the Work
5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 14
Taxes
3.6, 3.8.2.1, 7.3.7.4
Termination by the Contractor
14.1, 15.1.6
Termination by the Owner for Cause
5.4.1.1, **14.2**, 15.1.6
Termination by the Owner for Convenience
14.4
Termination of the Contractor
14.2.2
TERMINATION OR SUSPENSION OF THE CONTRACT
14
Tests and Inspections
3.1.4, 3.3.3, 4.2.2, 4.2.6, 4.2.8, 9.4.3.3, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 12.2.1, **13.5**
TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2, 7.3.1, 7.4, **8.3**, 9.5.1, 10.3.2, 14.3.2, 15.1.5, 15.2.5
Time Limits
2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.1, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.4.2, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 11.4, 12.2, 13.5, 13.7, 14, 15
Time Limits on Claims
3.7.4, 10.2.8, **13.7**, 15.1.2
Title to Work
9.3.2, 9.3.3
Transmission of Data in Digital Form
1.6
UNCOVERING AND CORRECTION OF WORK
12
Uncovering of Work
12.1
Unforescen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 7.3.4
Use of Documents
1.1.1, 1.5, 2.2.5, 3.12.6, 5.3
Use of Site
3.13, 6.1.1, 6.2.1
Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Architect
13.4.2
Waiver of Claims by the Construction Manager
13.4.2
Waiver of Claims by the Contractor
9.10.5, 13.4.2, 15.1.6
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.4.2, 14.2.4, 15.1.6
Waiver of Consequential Damages
14.2.4, 15.1.6
Waiver of Liens
9.10.2, 9.10.4
Waivers of Subrogation
6.1.1, **11.3.7**
Warranty
3.5, 4.2.15, 9.3.3, 9.8.4, 9.9.1, 9.10.4, 12.2.2
Weather Delays
15.1.5.2
Work, Definition of
1.1.3
Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.3, 9.3.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 10.3.2, 11.4.1, 13.2, 13.4.2, 15.4.4.2
Written Interpretations
4.2.17, 4.2.18
Written Notice
2.3, 2.4, 3.3.1, 3.9, 3.12.9, 3.12.10, 5.2.1, 5.3, 5.4.1.1, 8.2.2, 9.4, 9.5.1, 9.7, 9.10, 10.2.2, 10.3, 11.1.3, 12.2.2, 12.2.4, **13.3**, 13.5.2, 14, 15.4.1
Written Orders
1.1.1, 2.3, 3.9, 7, 8.2.2, 12.1, 12.2, 13.5.2, 14.3.1, 15.1.2

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents. The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement), and consist of 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 the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, 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 Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) 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 Multiple Prime 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 showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

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

§ 1.1.7 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker. The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 Correlation and Intent of the Contract Documents

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

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

§ 1.5 Ownership and Use of Drawings, Specifications and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. 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, or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 Transmission of Data in Digital Form

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Article 4, the Construction Manager and the Architect do not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information 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.

§ 2.2 Information and Services Required of the Owner

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

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the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, 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.

§ 2.2.3 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. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.2.6 The Owner shall endeavor to forward all communications to the Contractor through the Construction Manager and shall contemporaneously provide the same communications to the Architect about matters arising out of or relating to the Contract Documents.

§ 2.3 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to earry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-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, 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 reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's and Architect's and their respective consultants' additional services 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 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The plural term "Multiple Prime Contractors" refers to persons or entities who perform construction under contracts with the Owner that are administered by the Construction Manager. The term does not include the Owner's own forces, including persons or entities under separate contracts not administered by the Construction Manager.

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

§ 3.1.4 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 or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measuremcnts of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contraetor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construetion Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect any nonconformity discovered by or made known to the Contractor as a request for information submitted to Construction Manager in such form as the Construction Manager and Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences betwcen field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instruction concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or proccdures, the Contractor shall evaluate the jobsite safety thereof and, exccpt as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner, the Construction Manager, and the Architect and shall not proceed with that portion of the Work without further written instructions from the Architect, through the Construction Manager. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

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§ 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 for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of the Project already performed 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, eonstruction 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 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

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

§ 3.5 Warranty

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 the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform with the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and 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

The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor that 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, Notices, and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Owner, through the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay for other permits, fees, licenses and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

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

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that 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, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect and

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Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that 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, in consultation with the Construction Manager, 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 promptly notify the Owner, Construction Manager, and Contractor in writing, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager, and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 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 to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents:

.1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 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 but not in the allowances; and

.3 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 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 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.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner and Architect through the Construction Manager, the name and qualifications of a proposed superintendent. The Construction Manager may reply within 14 days to the Contractor in writing stating (1) whether the Owner, the Construction Manager, or the Architect has reasonable objection to the proposed superintendent or (2) that any of them require additional time to review. Failure of the Construction Manager to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner, Construction Manager or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction Schedules

§ 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. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at

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appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Projeet schedule to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Multiple Prime Contractors or the construction or operations of the Owner's own forces.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter update it as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Construction Manager's and Architect's approval. The Architect and Construction Manager's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager and Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager and Architect and incorporated into the approved Project schedule.

§ 3.11 Documents and Samples at the Site

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These documents shall be available to the Architect and delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 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 that 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. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.9 through 4.2.11. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Construction Manager Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the Project submittal schedule approved by the Construction Manager and Architect, or in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Multiple Prime Contractors or the Owner's own forces. 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 Multiple Prime Contractors.

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§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner, Construction Manager, and Architect, that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed and approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the 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 (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the 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. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities 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. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

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§ 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 Multiple Prime Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner's own forces or by other Multiple Prime Contractors except with written consent of the Construction Manager, Owner and such other Multiple Prime Contractors; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the other Multiple Prime 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 waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

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

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner, 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 or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner, Architect, or Construction Manager. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect through the Construction Manager.

§ 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) but only to the extent caused by the 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 that 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 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.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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§ 4.1.2 The Owner shall retain a construction manager lawfully licensed to practice construction management or an entity lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.3 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.

§ 4.1.4 If the employment of the Construction Manager or Architect is terminated, the Owner shall employ a successor construction manager or architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

§ 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect will provide administration of the Contract as described in the Contract Documents and will be the Owner's representatives during construction until the date the Architect issues the final Certificate for Payment. The Construction Manager and Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully 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 the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner and Construction Manager (1) known deviations from the Contract Documents and from the most recent Project schedule prepared by the Construction Manager, and (2) defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide a staffing plan to include one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner reasonably informed of the progress of the Work, and will report to the Owner and Architeet (1) known deviations from the Contract Documents and the most recent Project schedule, and (2) defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Multiple Prime Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, or charge of, construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of 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 or entities performing portions of the Work.

§ 4.2.6 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 endeavor to communicate with each other through the Construction Manager, and shall contemporaneously provide the same communications to the Architect about matters arising out of or relating to the Contract Documents. 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 Multiple Prime Contractors shall be through the Construction Manager and shall be contemporaneously provided to the Architect if those communications are about matters arising out of or related to the Contract Documents. Communications by and with the Owner's own forces shall be through the Owner.

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§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents and will notify each other about the rejection. The Construction Manager shall determine in general whether the Work of the Contractor is being performed in accordance with the requirements of the Contract Documents and notify the Owner, Contractor and Architect of defects and deficiencies in the Work. Whenever the Construction Manager considers it necessary or advisable, 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, upon written authorization of the Owner, 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 4.2.18 through 4.2.20 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 4.2.8 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.

§ 4.2.9 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data and Samples. Where there are Multiple Prime Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from Contractor and other Multiple Prime Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.10 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 in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.11 Review of the Contractor's submittals by the Construction Manager and Architect 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 Construction Manager and 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 Construction Manager and Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Construction Manager and 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.

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

§ 4.2.13 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7 and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.14 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples and similar

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required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.15 The Construction Manager will assist the Architect in conducting inspections to determine the dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

§ 4.2.16 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.

§ 4.2.17 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 through the Construction Manager. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.18 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.

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

§ 4.2.20 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing to the Construction Manager to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

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 Doeuments as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include other Multiple Prime Contractors or subcontractors of other Multiple Prime 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 may reply within 14 days to the Contractor in writing stating (1) whether the Owner, the Construction Manager or the Architect has reasonable objection to any such proposed person or entity or, (2) that the

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Construction Manager, Architect or Owner requires additional time for review. Failure of the Construction Manager, Owner, or Architect to reply within the 14-day period 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 Architeet 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. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner, Construction Manager or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including responsibility for safety of the Subcontractor's Work, 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 respeet 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 that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 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 that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor Contractor or other entity. If the Owner assigns the subcontract to a successor Contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

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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, and 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 in Article 15.

§ 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 that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11 and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner's own forces, Construction Manager and other Multiple Prime 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 Multiple Prime 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 Multiple Prime 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 The Contractor shall reimburse the Owner for costs the Owner incurs, including costs that are payable to a separate contractor or to other Multiple Prime Contractors because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of delays, improperly timed activities, damage to the Work or defective construction by the Owner's own forces or other Multiple Prime Contractors.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner, separate contractors, or other Multiple Prime Contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and other Multiple Prime 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

If a dispute arises among the Contractor, other Multiple Prime Contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may elean up and the Construction Manager, with notice to the Architect, will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

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§ 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 the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 Change Orders

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

§ 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 prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall 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 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 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.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement 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.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Construction Manager shall determine the method and the adjustment 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, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. 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 7.3.7 shall be limited to the following:

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.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.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect. 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.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect determine to be reasonably justified. The interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Construction Manager and Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work
The Architect has 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 will be effected by written order issued through the Construction Manager and shall be binding on the Owner and Contractor.

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.

§ 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 and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

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

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§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner, Owner's own forces, Construction Manager, Architect, any of the other Multiple Prime 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 mediation and arbitration, or by other causes that 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 Article 15.

§ 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

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

Where the Contract is based on a Stipulated Sum or Guaranteed Maximum Price, the Contractor shall submit to the Construction Manager, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and 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. In the event there is one Contractor, the Construction Manager shall forward to the Architect the Contractor's schedule of values. If there are Multiple Prime Contractors responsible for performing different portions of the Project, the Construction Manager shall forward the Multiple Prime Contractors' schedules of values only if requested by the Architect.

§ 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 prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. 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 shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager and Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier unless such Work has been performed by others whom the Contractor intends to pay.

§ 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 the costs of 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

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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 Where there is only one Contractor, the Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect. Within seven days after the Architect receives the Contractor's Application for Payment from the Construction Manager, the Architect will either issue to the Owner a Certificate for Payment, with a copy to the Construction Manager, for such amount as the Architect determines is properly due, or notify the Construction Manager and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect's notice of withholding certification.

§ 9.4.2 Where there are Multiple Prime Contractors performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives the Multiple Prime Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Multiple Prime Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Multiple Prime Contractors' application with information from similar applications for progress payments from other Multiple Prime Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Multiple Prime Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.3 Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager, for such amount as the Architect determines is properly due, or notify the Construction Manager and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

§ 9.4.4 The Construction Manager's certification of an Application for Payment or, in the case of Multiple Prime Contractors, a Project Application and Certificate for Payment shall be based upon the Construction Manager's evaluation of the Work and the information provided as part of the Application for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information and belief, the Work has progressed to the point indicated and the quality of the Work is in accordance with the Contract Documents. The certification will also constitute a recommendation to the Architect and Owner that the Contractor be paid the amount certified.

§ 9.4.5 The Architect's issuance of a Certificate for Payment or in the case of Multiple Prime Contractors, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and information provided as part of the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated, that the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified.

§ 9.4.6 The representations made pursuant to Sections 9.4.4 and 9.4.5 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 correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.7 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,

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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 withhold a Certificate for Payment or Project 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 9.4.4 and 9.4.5 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.3. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment or Project 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 for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.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 a separate 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** repeated 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.

§ 9.5.3 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager and both will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment or 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 pay each Subcontractor, no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 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 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner, Construction

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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 Contractor payments to material and equipment 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.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contraetor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 Failure of Payment

If the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if 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 binding dispute resolution, 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, plus interest as provided for in the Contract Documents.

§ 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 shall notify the Construction Manager, and the Contractor and Construction Manager shall jointly prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the 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 sufficiently complete in accordance with the requirements of the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect, assisted by the Construction Manager, to determine Substantial Completion.

§ 9.8.4 When the Architect, assisted by the Construction Manager, determines that the Work or designated portion thereof is substantially complete, the Construction Manager will prepare, and the Construction Manager and Architect shall execute a Certificate of Substantial Completion that 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.

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§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 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 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. 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 evaluate the completion of Work of the Contractor and then forward the notice and Application, with the Construction Manager's recommendations, to the Architect who will promptly make such inspection. When the Architect, 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 or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project 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.

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§ 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.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

§ 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, eustody 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 comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and 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 or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 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

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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 permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to, asbestos or polychlorinated biphenyl (PCB),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.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain 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 cause it to be 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. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, 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 or substance presents the risk of bodily injury or death as described in Section 10.3.1 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), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

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§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 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 and completed 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;
- **.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 for bodily injury or property damage arising out of completed operations; and
- **.8** 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 the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 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 and thereafter upon renewal or replacement of each required policy of insurance. 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. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Construction Manager, the Construction Manager's consultants, the Owner, the Architect, and the

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Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 Owner's Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 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 written on a builder's risk "all risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional 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 later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for the Architect's, Contractor's, and Construction Manager's services and expenses required as a result of such insured loss.

§ 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 that 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 in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 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.

§ 11.3.2 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.

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§ 11.3.4 If the Contraetor requests in writing that insurance for risks other than those described herein or other special causes of loss 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 causes of loss 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, and that its limits will not be reduced, 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 (1) each other and any of their subcontractors, sub-subcontractors, agents and employees each of the other, and (2) the Construction Manager, Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss 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 eaeh 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 indemnifieation, 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 the Owner's property insuranee 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 as determined in aceordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 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 is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or distribution of insurance proceeds in accordance with the direction of the arbitrators.

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§ 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 authorize a copy to be furnished.

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 requested 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 at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense 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 Before or After Substantial Completion

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 discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's and Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, 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. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period 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 completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors or other Multiple Prime Contractors caused by the

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Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that 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

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, 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.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 Written Notice

Written notice shall be deemed to have been duly served if delivered in person to the individual, to 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 or by courier service providing proof of delivery 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 shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. 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 that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and

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(2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Construction Manager, Arehitect, 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 that the Construction Manager and Architect may be present for such procedures. Such costs except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Construction Manager's and Architect's services and expenses shall be at the Contractor's expense.

§ 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

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 Time Limits on Claims

The Owner and the Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and the Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- **.3** Because the Construction Manager has not certified or the 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, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

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§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work 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.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner, Construction Manager and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly 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 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** 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** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; 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 Initial Decision Maker 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** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 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, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall, upon application, be certified by the Initial Decision Maker 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 The Contract Sum and the Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

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.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.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 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 and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, 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 The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 Notice of Claims. Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Construction Manager and Architect, if the Construction Manager and or Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated 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.

§ 15.1.3 Continuing Contract Performance. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Construction Manager will prepare Change Orders and the Architect will issue a Certificate for Payment or Project Certificate for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 Claims for Additional Cost. If the Contractor wishes to make a 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.

§ 15.1.5 Claims for Additional Time

§ 15.1.5.1 If the Contractor wishes to make a 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.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

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.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Deeision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect and Construction Manager, if the Architect or Construction Manager is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

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§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the partics mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing 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.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 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.

§ 15.4.3 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.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

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(1765370473)

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

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User Notes:

(1765370473)

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

SECTION 007300 - SUPPLEMENTARY GENERAL CONDITIONS A232-2009

The following supplements modify the "General Conditions of the Contract for Construction," AIA Document A232-2009. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

TABLE OF ARTICLES

1. GENERAL PROVISIONS

2. OWNER

3. CONTRACTOR

4. ADMINISTRATION OF THE CONTRACT

5. SUBCONTRACTORS

6. CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

7. CHANGES IN THE WORK

8. TIME

9. PAYMENTS AND COMPLETION

10. PROTECTION OF PERSONS AND PROPERTY

11. INSURANCE AND BONDS

12. UNCOVERING AND CORRECTION OF WORK

13. MISCELLANEOUS PROVISIONS

14. TERMINATION OR SUSPENSION OF THE CONTRACT

ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Delete the last sentence in its entirety and replace with the following:

"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."

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following Paragraphs:

1.2.4 In the case of an inconsistency between the Drawings and the Specifications, or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation.

1.2.5 The word "PROVIDE" as used in the Contract Documents shall mean "FURNISH AND INSTALL" and shall include, without limitation, all labor, materials, equipment, transportation, services and other items required to complete the Work.

1.2.6 The word "PRODUCT" as used in the Contract Documents means all materials, systems and equipment.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

Delete Paragraph 1.5.1 in its entirety and replace with the following:

"All pre-design studies, drawings, specifications and other documents, including those in electronic form, prepared by the Architect under this Agreement are, and shall remain, the property of the Owner whether the Project for which they are made is executed or not. Such documents may be used by the Owner to construct one or more like Projects without the approval of, or additional compensation to, the Architect. The Contractor, Subcontractors, Sub-subcontractors and Material or Equipment Suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or Material and Equipment Supplier on other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and Architect's consultants.

The Architect shall not be liable for injury or damage resulting from the re-use of drawings and specifications if the Architect is not involved in the re-use Project. ."

Delete Paragraph 1.5.2 in its entirety.

ARTICLE 2: OWNER

2.1 General

2.1.2 Delete Paragraph 2.1.2 in its entirety.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 Delete the last sentence in this paragraph.

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 cost for any repairs required, out of failure to accurately identify said utilities."

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

2.2.5 The Contractor shall be responsible to provide all Contract Documents (plans/specs) for their contract use. Owner will not supply documents.

ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

Delete the third sentence in Paragraph 3.2.4.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

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 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 the Architect.

3.3.4 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.

3.3.5 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 LABOR AND MATERIALS

Add the Following Paragraphs:

3.4.4 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 Manager 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 will not be recognized.

3.4.5 Under no circumstances shall the Contractor's Work proceed prior to preparatory 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 that Work, who shall maintain coordination at all times.

3.5 WARRANTY

Add the following Paragraphs:

3.5.1 The Contractor will warrant all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for two year after Acceptance by the Owner, and will maintain all items in condition that conforms with the Contract Documents during the period of warranty.

3.5.2 Non-conforming workduring the period of warranty will be corrected by the Contractor at its expense upon demand of the Owner, it being required that the Work conforms to the Contract Documents at the expiration of the warranty period.

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

3.5.4 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.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following Paragraphs:

3.11.1 During the course of the Work, the Contractor shall maintain a record set of drawings on which the Contractor shall mark the actual physical location of all piping, valves, equipment, conduit, outlets, access panels, controls, actuators, including all appurtenances that will be concealed once construction is complete, etc., including all invert elevations.

3.11.2 At the completion of the project, the Contractor shall obtain a set of reproducible drawings from the Architect, and neatly transfer all information outlined in 3.11.1 to provide a complete record of the as-built conditions.

3.11.3 The Contractor shall provide two (2) prints of the as-built conditions, along with the reproducible drawings themselves, to the Owner and one (1) set to the Architect. In addition, attach one complete set to each of the Operating and Maintenance Instructions/Manuals.

3.17 In the second sentence of the paragraph, insert "indemnify and" between "shall" and "hold".

ARTICLE 4: ARCHITECT AND CONSTRUCTION MANAGER

4.1 General

4.1.2 Insert "As required by law," at the beginning of the first sentence.

4.2 Administration of the Contract

Delete the first sentence of Paragraph 4.2.10 and replace with the following:

The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents.

Delete the second sentence of Paragraph 4.2.10 and replace with the following:

The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work in the activities of the Owner, Contractor or separate Contractors, while allowing sufficient time in the Owner's professional judgment to permit adequate review.

Add the following to Paragraph 4.2.16:

There will be no full-time project representative provided by the Owner or Architect on this project.

Add to Paragraph 4.2.19 "and in compliance with all applicable codes, regulations and ordinances." to the end of the sentence.

ARTICLE 5: SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

Delete Paragraph 5.2.3 in its entirety and replace with the following:

5.2.3 If the Owner, Architect or Construction Manager has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Architect or Construction Manager has no reasonable objection, subject to the statutory requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4.

ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

Delete Paragraph 6.1.3 in its entirety and replace with the following:

"When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Constructor who executes each separate Owner-Contractor Agreement."

6.2 MUTUAL RESPONSIBILITY

6.2.3 In the second sentence, strike the word "shall" and insert the word "may".

ARTICLE 7: CHANGES IN THE WORK

(SEE ARTICLE 7: CHANGES IN WORK IN THE GENERAL REQUIREMENTS)

ARTICLE 8: TIME

8.2 PROGRESS AND COMPLETION

Add the following Paragraphs:

8.2.1.1 Refer to Specification Section SUMMARY OF WORK for Contract time requirements.

8.2.4 If the Work falls behind the 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.

8.3 DELAYS AND EXTENSION OF TIME

8.3.1 Strike "arbitration" and insert "remedies at law or in equity".

Add the following Paragraph:

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.

8.3.5 The parties agree that Paragraph 8.3.3 of the Supplementary General Conditions does not apply to the Construction Manager in the event of a delay caused by a party other than the Construction Manager.

ARTICLE 9: PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES

Add the following Paragraphs:

9.2.1 The Schedule of Values shall be submitted into Building Blok (EDiS' Web-Based Project Management software) using AIA Document G702, Continuation Sheet to G703.

9.3 APPLICATIONS FOR PAYMENT

Add the following Paragraph:

9.3.1.3 Application for Payment shall be submitted on AIA Document G702 "Application and Certificate for Payment", supported by AIA Document G703 "Continuation Sheet". Said Applications shall be fully executed and notarized.

Add the following Paragraphs:

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.

9.3.5 The Contractor shall provide a current and updated Progress Schedule to the Architect with each Application for Payment. Failure to provide Schedule will be just cause for rejection of Application for Payment.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add the following to 9.5.1:

.8 failure to provide a current Progress Schedule;
.9 a lien or attachment is filed;
.10 failure to comply with mandatory requirements for maintaining Record Documents.

9.6 PROGRESS PAYMENTS

Delete Paragraph 9.6.1 in its entirety and replace with the following:

9.6.1 After the Architect and the Construction Manager have approved and issued a Certificate for Payment, payment shall be made by the Owner within 30 days after Owner's receipt of the Certificate for Payment.

9.7 FAILURE OF PAYMENT

In first sentence, strike the first reference to "seven" and insert "thirty (30)". Also strike "binding dispute resolution" and insert "remedies at law or in equity".

9.8 SUBSTANTIAL COMPLETION

9.8.5 In the second sentence, strike "shall" and insert "may".

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Paragraphs:

10.1.1 Each 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.

10.1.2 Each Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full time basis. 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 meetings by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following Paragraph:

10.2.4.1 As required in the Hazardous Chemical Act of June 1984, all vendors supplying any material that may be defined as hazardous must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a caution warning on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in foreseeable emergency situations. Material Safety Data Sheets shall be provided directly to the Owner, along with the shipping slips that include those products.

10.3 HAZARDOUS MATERIALS

Delete Paragraph 10.3.3 in its entirety.

Delete Paragraphs 10.3.6 in its entirety.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.4 Strike "the Owner" immediately following "(1)" and strike "and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations."

11.2 OWNER'S LIABILITY INSURANCE

Delete Paragraph 11.2 in its entirety.

11.3 PROPERTY INSURANCE

Delete Paragraph 11.3 and its subparagraphs in their entirety and replace with the following:

11.3 The Owner will not provide Builder's All Risk Insurance for the Project. The Contractor and all Subcontractors shall provide property coverage for their tools and equipment, as necessary. Any mandatory deductible required by the Contractor's Insurance shall be the responsibility of the Contractor.

11.4 PERFORMANCE BOND AND PAYMENT BOND

11.4.1 Add the following sentence: "The bonds will conform to those forms approved by the Office of Management and Budget."

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

Add the following Paragraph:

12.2.2.1.1 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 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.

12.2.2.2 Strike "one" and insert "two".

12.2.2.3 Strike "one" and insert "two".

12.2.5 In second sentence, strike "one" and insert "two".

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Strike "except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4."

Insert "except that, if the parties have selected arbitration as the method of dispute resolution, the Delaware Arbitration Act, 10 Del. C. §5701, shall govern Section 15.4."

13.6 INTEREST

Strike "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." Insert "30 days of presentment of the authorized Certificate of Payment at the annual rate of 12% or 1% per month.

13.7 TIME LIMITS ON CLAIMS

Strike the last sentence.

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 State of America, the Contractor shall notify the Architect and Owner immediately upon discovery.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

Delete Paragraph 14.4.3 in its entirety and replace with the following:

14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and cost incurred by reason of such termination along with reasonable overhead.

ARTICLE 15: CLAIMS AND DISPUTES

15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

Delete Paragraph 15.1.6 and its subparagraphs in their entirety.

15.2 INITIAL DECISION

Delete Paragraph 15.2.5 in its entirety and replace with the following:

15.2.5 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 or in equity.

Delete Paragraph 15.2.6 and its subparagraphs in their entirety.

15.3 MEDIATION

15.3.1 Strike "binding dispute resolution" and insert "any or all remedies at law or in equity".

15.3.2 In the first sentence, delete "administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedure in effect on the date of the Agreement,". Also strike "binding dispute resolution" and insert "remedies at law and in equity".

STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT

15.4 ARBITRATION

Delete Paragraph 15.4 and its subparagraphs in their entirety.

END OF SUPPLEMENTARY GENERAL CONDITIONS

SECTION 007343 – WAGE RATE REQUIREMENTS

1. SUMMARY

A. 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.

B. 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. 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. Where wage rates are published in this Manual they are issued by the State Department of Labor on the date indicated and is 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. "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. A Payroll Report, available from the Department of Labor is to be used to provide this information.

F. 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
4425 NORTH MARKET STREET
WILMINGTON, DELAWARE 19802

TELEPHONE (302) 761-8200
FAX (302) 761-6601

Via Email and Regular Mail

February 1, 2017

Mr. Kevin Lucas
EDIS Company
110 S. Poplar Street
Suite 400
Wilmington, DE 19801

Re: Howard High School Bid Package D - Phase II, New Castle County, DE

Dear Mr. Lucas:

I am responding to your request for a category determination for the Howard High School Bid Package D - Phase II, which is a state funded construction project located in New Castle County, DE. The work consists of renovations to the 1927 portion of Howard High School. You estimate the total cost of construction for this project to be $14,397,000.00.

Based upon the information you provided the Department of Labor has determined that this project is a Building Construction project.

Delaware's Prevailing Wage Regulations provide that the rates applicable to a project are the rates in effect on the date of publication of the specifications for that project. I have enclosed a certified copy of the March 15, 2016 prevailing wage rates for Building Construction to be included in your bid specification. However, please be advised that, in the event that a contract for a project is not executed within one hundred and twenty (120) days from the earliest date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project.

Lastly, please see the enclosed debarment list. Entities/individuals listed shall not be permitted to bid on, be awarded or work on Delaware State funded construction projects, in the timeframe specified, as provided for under 29 Del.C. §6960 or other applicable State statutes.

If you have any questions or I can provide any additional assistance, please do not hesitate to contact me at 302-761-8326.

Sincerely,

Randall Carrow
Labor Law Enforcement Officer
Randall.Carrow@state.de.us

Enclosures

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, 2016

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	22.58	27.81	40.47
BOILERMAKERS	67.59	34.29	50.41
BRICKLAYERS	50.49	50.49	50.49
CARPENTERS	52.81	52.81	41.97
CEMENT FINISHERS	70.82	30.05	21.89
ELECTRICAL LINE WORKERS	44.90	38.50	29.36
ELECTRICIANS	65.10	65.10	65.10
ELEVATOR CONSTRUCTORS	83.06	63.69	31.54
GLAZIERS	69.30	69.30	55.95
INSULATORS	54.38	54.38	54.38
IRON WORKERS	61.20	61.20	61.20
LABORERS	43.60	43.60	43.60
MILLWRIGHTS	66.83	66.83	53.40
PAINTERS	46.72	46.72	46.72
PILEDRIVERS	72.97	38.86	31.43
PLASTERERS	29.47	29.47	21.84
PLUMBERS/PIPEFITTERS/STEAMFITTERS	65.95	50.85	55.34
POWER EQUIPMENT OPERATORS	61.36	61.36	43.28
ROOFERS-COMPOSITION	23.49	23.40	20.87
ROOFERS-SHINGLE/SLATE/TILE	18.16	18.07	16.98
SHEET METAL WORKERS	65.14	65.14	65.14
SOFT FLOOR LAYERS	49.77	49.77	49.77
SPRINKLER FITTERS	54.57	54.57	54.57
TERRAZZO/MARBLE/TILE FNRS	55.72	55.72	46.92
TERRAZZO/MARBLE/TILE STRS	63.98	63.98	54.33
TRUCK DRIVERS	28.39	27.10	20.68

CERTIFIED: 2/01/17

BY: _____
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: Howard High School Bid Package D Phase II; New Castle Co., DE,

PREVAILING WAGE DEBARMENT LIST

The following contractors have been debarred for violations of the prevailing wage law 29Del.C. §6960 or other applicable State statutes.

Therefore, no public construction contract in this State shall be bid on, awarded to, or received by contractors and individuals on this list for a period of (3) three years from the date of the judgment or as deemed by a court of competent jurisdiction.

Contractor	Address	Date of Debarment
Mullen Brothers, Inc. and Daniel Mullen, individually	3375 Garnett Road, Boothwyn, PA 19060	Indefinite/ Civil Contempt
MMR Associates DBA Peninsula Glass and Michael Rooney, individually	679 Horse Pond Road, Dover, DE 19901	1/20/2015
Site Work Safety Supplies, Inc. and Peter Coker, individually	4020 Seven Hickories Road Dover, DE 19904	1/12/2016
Green Granite and Jason Green, individually	604 Heatherbrooke Court Avondale, PA 19311	Indefinite/ Civil Contempt
DCS Staffing & Cleaning Professionals, LLC	4805 Garrison Blvd. Suite 200 Baltimore, MD 21821	Indefinite/ 19 Del.C. 2374(f)
Pro Image Landscaping, Inc. and Owner(s) individually	23 Commerce Street Wilmington, DE 19801 and/or 2 Cameo Road Claymont, DE 19703	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
Liberty Mechanical, LLC and Owner(s), individually	2032 Duncan Road Wilmington, DE 19801	Indefinite/ 19 Del.C. 2374(f)
Integrated Mechanical and Fire Systems Inc. and Allison Sheldon, individually	4601 Governor Printz Boulevard Wilmington, DE 19809	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)

Updated: September 27, 2016

SECTION 008114 – DRUG TESTING FORMS

1. SUMMARY

A. Pursuant to 4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds submit Testing Report Forms to the Owner no less than quarterly. See the form attached hereto.

B. The Contractor will notify the Owner in writing of any positive results of random drug testing. See the form attached hereto. The results must be reported to the Owner within 24 hours of receipt of the test results.

EMPLOYEE DRUG TESTING REPORT FORM

Period Ending:_____

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds submit Testing Report Forms to the Owner no less than quarterly.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Number of employees who worked on the jobsite during the report period:_____

Number of employees subject to random testing during the report period:_____

Number of Negative Results _____ Number of Positive Results _____

Action taken on employee(s) in response to a failed or positive random test:

_____

_____

_____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

EMPLOYEE DRUG TESTING
REPORT OF POSITIVE RESULTS

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds to notify the Owner in writing of a positive random drug test.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Name of employee with positive test result:_____

Last 4 digits of employee SSN:_____

Date test results received:_____

Action taken on employee in response to a positive test result:

_____

_____

_____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

This form shall be sent by mail to the Owner within 24 hours of receipt of test results.

Enclose this test results form in a sealed envelope with the notation "Drug Testing Form – DO NOT OPEN" on the face thereof and place in a separate mailing envelope.

END OF SECTION

4000 Office of Management and Budget
4100 Division of Facilities Management

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects

1.0 Purpose

The Office of Management and Budget ("Office"), has developed these regulations that require Contractors and Subcontractors to implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds pursuant to 29 **Del.C.** §6908(a)(6). The regulations establish the mechanism, standards and requirements of a Mandatory Drug Testing Program that will be incorporated by reference into all Large Public Works Contracts awarded pursuant to 29 **Del.C.** §6962.

2.0 Definitions

"**Contractor**" means an entity such as, but not limited to, an individual, firm, partnership or corporation that has a contractual obligation to perform work for contracts awarded pursuant to 29 **Del.C.** §6962.

"**Division of Facilities Management**" and "**DFM**" means the Division of Facilities Management within the Office of Management and Budget.

"**Drug Testing Firm**" is an entity engaged in the business of providing drug testing services for businesses, individuals, governments or any entity that requires drug testing of Employees, applicants, licensees, etc., in compliance with these requirements.

"**Employee**" means an individual employed by a Contractor or Subcontractor who works on the Jobsite of a Large Public Works Contract but does not fulfill a clerical or administrative function. For the purpose of this definition, clerical or administrative functions shall refer to job responsibilities that do not generally require an employee to work outside of the Contractor's Jobsite office, home office or other employer-provided office. For the purposes of this regulation, the term "Employee" shall also include supervisors and foremen working on the Jobsite. The term "Employee" shall also include delivery personnel employed by a Contractor or Subcontractor working on or delivering materials and equipment to and from a Jobsite.

"**Impairment**" **or** "**Impaired**" means symptoms that an Employee while working may be under the influence of drugs or alcohol that may decrease or lessen the Employee's performance of the duties or tasks of the Employee's job position, including symptoms of the Employee's speech, walking, standing, physical dexterity, agility, coordination, actions, movement, demeanor, appearance, clothing, odor, irrational or unusual behavior, negligence or carelessness in operating equipment, machinery or production or manufacturing processes, disregard for the safety of the Employee or others, or other symptoms causing a reasonable suspicion of the use of drugs or alcohol.

"**Jobsite**" means the site or area directly or indirectly owned, operated or controlled by the Owner in which the Contractor or Subcontractor performs work or delivers services to the Owner. For the purpose of this definition, "Jobsite" does not mean a remote work site not under the direct or indirect control of the Owner in which work is performed to fulfill the Contractor's or Subcontractor's obligations.

"**Large Public Works Contract**" means a contract for a public works construction awarded pursuant to 29 **Del.C.** §6962.

"**Mandatory Drug Testing Program**" and "**Program**" means a defined set of basic procedures, requirements and rules that must be used by a Contractor or Subcontractor to test Employees for drugs in compliance with these requirements.

"**Owner**" is the state agency, school district or entity that awards a Large Public Works Contract to a Contractor pursuant to 29 **Del.C.** §6962.

"**Positive Test Result**" and "**Fail a Drug Test**" means the result reported by a Health and Human Services certified laboratory when a specimen contains a drug or drug metabolite equal to or greater than the cutoff concentration. For purposes of these regulations, an Employee shall not be considered to have a Positive Test Result nor shall an Employee be considered to "Fail a Drug Test" if:

- The Employee is a Registered Qualifying Patient and;
- The drug detected was marijuana, a component of marijuana, or marijuana metabolites.

"**Random Drug Testing**" means that an Employee is chosen at random for testing without advance notice, from a pool of Employees working on the Jobsite. Specific requirements for random drug testing conducted under these regulations are described in Section 5.0.

"**Registered Qualifying Patient**" means a person (1) validly issued and in possession of an unexpired Registry Identification Card as defined by 16 **Del.C.** §4902A (14), and (2) subject to confirmation through a "verification system" as set forth at 16 **Del.C.** §4902A(17).

"**Subcontractor**" means an entity such as, but not limited to, an individual, firm, partnership or corporation that has a contractual obligation to perform work for, or supply services to a Contractor as defined in section 2.1.

"**Testing Result Forms**" means a form summarizing drug testing completed monthly by the Contractor and Subcontractor and submitted to the Owner in accordance with requirements contained in the bid solicitation.

3.0 Employee drug testing documentation requirements.

3.1 The following documentation requirements apply:

3.1.1 At bid submission - A solicitation for a Large Public Works Contract must require each Contractor that submits a bid for the work to submit with the bid signed individual affadavit(s) for the Contractor and each listed Subcontractor certifying that the Contractor and Subcontractor has in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for their Employees that complies with this regulation.

3.1.2 Two business days prior to contract execution – The awarded Contractor shall provide to the Owner copies of the Employee Drug Testing Program for the Contractor and for all listed Subcontractors.

3.1.3 During contract execution – Contractors that employ additional Subcontractors on the jobsite may do so only after submitting a copy of the Subcontractor's Employee Drug Testing Program. A Contractor or Subcontractor shall not commence work until the Owner has concluded the Employee Drug Testing Program complies with this Regulation as per Section 3.2.

3.1.4 In the event of an emergency a Contractor may employ additional Subcontractors on the jobsite prior to submitting the Subcontractor's Employee Drug Testing Program provided that said Program is submitted to the Owner as soon as practicable.

3.2 A Contractor or Subcontractor shall be treated as having a Mandatory Drug Testing Program that complies with this regulation if the Program includes the following:

3.2.1 The Program meets the minimum standards in section 4.0 of this regulation.

3.2.2 The Program provides for the frequency of testing of Employees as per section 5.0 of this regulation:

3.2.3 The Program imposes disciplinary measures on an Employee who fails a drug test as per section 6.0 of this regulation.

3.3 Prequalified Contractors and Subcontractors – A Contractor or Subcontractor may meet the provisions of Section 3.1 if they are Prequalified through the DFM Prequalification and if the DFM Prequalification includes provisions requiring an Employee Mandatory Drug Testing Program that meet the requirements of Sections 4.0, 5.0 and 6.0 of this Regulation

3.4 The State shall not be obligated to pay, and the Contractor or Subcontractor shall expressly agree that, any portion of work performed by a Contractor or Subcontractor commenced before that Contractor or Subcontractor has complied with Sections 3.1 and 3.2, provided however that emergency work as referenced in 3.1.4 may not be subject to this provision.

4.0 Minimum Standards for a Mandatory Drug Testing Program

4.1 Testing for the presence of drugs in an Employee's system and the handling of test specimens shall be conducted in accordance with guidelines for the collection, chain-of-custody procedures, laboratory testing, and Medical Officer Review procedures contained within the Mandatory Guidelines for Federal Workplace Drug Testing Programs published by the Substance Abuse and Mental Health Services Administration (SAMHSA). http://workplace.samhsa.gov/DrugTesting/Level_1_Pages/mandatory_guidelines5_1_10.html

All tests must be processed by a federal Health and Human Services certified laboratory. Contractors must provide documentation detailing the procedures used in the collection, testing and reporting of drug tests sufficient to show conformance with SAMHSA guidelines.

4.2 Contractors and Subcontractors subject to these regulations may procure the services of an appropriate Drug Testing Firm to administer their program. A Contractor or Subcontractor may also implement a Mandatory Drug

Testing Program using in-house personnel and resources. However a Contractor or Subcontractor doing so shall have to demonstrate that the program meets or exceeds the requirements specified herein to the satisfaction of the Owner.

4.3 Employees subject to drug testing shall be tested using at a minimum a seven-panel protocol testing plus alcohol screening for the following:

Substance	Common Name	Cutoff
Marijuana metabolite		50 ng/ml
Cocaine metabolite		150 ng/ml
Opiate metabolite		2000 ng/ml
Acetylmorphine	Heroin metabolite	10 ng/ml
Phencyclidine	PCP	25 ng/ml
Amphetamines (including Methamphetamines)	Meth	500 ng/ml
MDMA	Ecstasy	250 ng/ml
Alcohol		0.04% BAC

4.4 The frequency of Random Drug Testing and the methodology for selecting Employees to be screened are defined in section 5.0 and shall be incorporated into Contractor and Subcontractor mandatory testing procedures. A Contractor or Subcontractor may incorporate rules or requirements that exceed the requirements defined herein.

5.0 Drug Testing Requirements – Frequency for the Testing of Employees

5.1 Initial Drug Testing - Employees commencing work on a Jobsite must be tested with the exception that an Employee who has passed a random or scheduled drug test within the past 60 days from the date of commencing work shall be permitted to work at the Jobsite without further testing; however, the Employee is still subject to random testing.

5.2 Random Drug Testing - During the course of a project, each Contractor and Subcontractor with Employees on the Jobsite shall implement Random Drug Testing according to the following requirements.

5.2.1 All Employees will be subject to random, unannounced testing.

5.2.2 The selection of Employees shall be made by a scientifically valid method of randomly generating an Employee identifier from a Contractor or Sub-contractor's pool of Employees.

5.2.3 No less that 10% of a Contractor's or Subcontractor's anticipated workforce based on construction schedules validated by certified payrolls shall be randomly selected each month for testing. Contractors or Subcontractors with less than 10 Employees shall test at least one of their Employees, selected randomly per month. Each Employee shall have an equal chance of selection each time the selection is made. Because the selection process is random, some Employees may not be tested within a year, while others may be tested more than once.

5.2.4 Employees notified that they have been selected must report within four hours for testing to a site specified. Employees so notified must have been given such notification at least four hours before the scheduled closing time of the testing facility. Any failure to report for random testing, or to cooperate with the testing procedure shall be considered a positive result.

5.2.5 Purposely impeding or delaying an Employee's fulfillment of the testing requirements herein by a Contractor or Subcontractor may subject the Contractor or Subcontractor to sanctions listed in Section 8.

5.3 Reasonable Suspicion Testing – An Employee will be required to take a drug test at any time his or her employing Contractor, Subcontractor or the Owner reasonably believes that he or she has an Impairment caused by drugs and/or alcohol. Further, an Employee may be required to take a drug test at any time his or her employing Contractor, Subcontractor or the Owner finds drug paraphernalia and/or open alcohol containers on the Jobsite.

5.4 Return to Duty Testing – As required in Section 6.0.

5.5 Accident Triggered Testing – An Employee will be required to take a drug test and may be subject to an onsite alcohol breathalyzer test at any time there is a Jobsite accident involving loss or significant property damage, injury or death to an Employee of the Contractor, Subcontractor, or Owner or member of the public.

5.5.1 As soon as practicable following an accident, the Contractor will notify the Employee(s) whose performance could have contributed to the accident of the need for the test.

5.5.2 The appropriate Contractor shall ensure that an Employee, required to be tested under this section, is tested as soon as practicable, but no longer than 4 hours after the accident. Employees so notified must have been given such notification at least four hours before the scheduled closing time of the testing facility. If the drug test is not conducted within 4 hours, attempts to conduct the test must cease and the reasons for the failure to test documented.

5.5.3 An Employee who is subject to post-accident testing who fails to remain readily available for such testing, including notifying a supervisor of his or her location if he or she leaves the scene of the accident prior to submission to such test, may be deemed to have refused to submit to testing.

5.5.4 If an Employee fails or refuses to be tested, he/she must be removed from the Jobsite.

5.5.5 Nothing in this section shall be construed to require the delay of necessary medical attention for the injured following an accident, or to prohibit an Employee from leaving the scene of an accident for the period necessary to obtain assistance in responding to the accident, or to obtain necessary emergency medical care.

5.6 All testing required by this section shall be administered according to the standards outlined in Section 4.0.

6.0 Consequences of a Positive Test Result

6.1 The disciplinary measures contained within a Contractor's or Subcontractor's drug testing program for an employee who tests positive to a mandatory drug test must include at a minimum, all of the following:

6.1.1 The Employee is subject to an immediate suspension from any public works Jobsite.

6.1.2 The Employee is not eligible for reinstatement by the Contractor or Subcontractor to any public works Jobsite until 30 days after the Employee tests negative on a seven drug panel plus alcohol test certified by a medical review officer.

6.1.3 The Employee is subject to unscheduled monthly random testing for at least one (1) year after reinstatement, or during the term of the Large Public Works Contract, whichever is less.

6.1.4 An Employee who has tested positive for more than one drug test within a three year period shall be permanently banned from working at public works Jobsites.

6.1.5 An Employee who has tested positive for marijuana, a component of marijuana, or marijuana metabolites and is a Registered Qualifying Patient shall be exempted from the disciplinary actions contained in this section unless:

6.1.5.1 The Employee was Impaired by marijuana at the Jobsite

6.1.5.2 Employment of the Registered Qualifying Patient would cause the Owner to lose monetary or licensing-related benefits under Federal law.

6.2 A Contractor or Subcontractor shall report the Positive Test Result to the Employee's professional licensing board, if applicable.

7.0 Contractor and Subcontractor Certification of Compliance with Regulations

7.1 During the term of the contract:

7.1.1 During the term of the contract, Contractors and Subcontractors shall submit Testing Report Forms to the Owner as set forth herein:

7.1.1.1 The Testing Report Forms shall be submitted to the Owner no less than quarterly.

7.1.1.2 An Owner may require monthly submissions of the Testing Report Forms.

7.1.1.3 A Contractor or Subcontractor that is employed on the Jobsite for less than 30 days shall not be subject to the reporting requirements contained in Sections 7.1.1 and 7.1.2 of this regulation, unless the Owner specifies that such reporting is required in the Invitation to Bid or Specifications relating to the work to be performed.

7.1.2 The forms shall at a minimum contain the following information:

7.1.2.1 The number of Employees who worked on the Jobsite during the previous month.

7.1.2.2 The number of Employees subjected to random testing during the previous month.

7.1.2.3 The number of negative results and the number of positive results.

7.1.2.4 Action taken by the Contractor or Subcontractor on an Employee who failed or tested positive to a random test.

7.1.3 Testing Result Forms may be submitted electronically to an Owner.

7.1.4 Any Positive Test Result including the Employee name and action taken in response by a Contractor or Subcontractor must be reported by the Contractor or Subcontractor to the Owner within 24 hours of the Contractor or Subcontractor receiving the test results. A Positive Test Result must be submitted to the Owner in writing.

7.1.5 The Owner shall have the right to periodically audit all Contractor and Subcontractor test results at the Contractor or Subcontractor's offices.

7.1.6 The failure to comply with these reporting requirements shall be considered a material breach of any agreement relating to the performance of work by the Contractor or Subcontractor.

8.0 Penalties

8.1 A Contractor or Subcontractor on a Large Public Works contract that fails to implement a Mandatory Drug Testing Program in accordance with this regulation or falsifies testing results shall be subject to the following sanctions:

8.1.1 Written warning (1st offense).

8.1.2 Prohibition from bidding on new public works jobs for a period not to exceed three months (2nd offense) and one year (3rd offense).

8.1.3 For subsequent offenses, debarment or bond revocation.

8.2 Notwithstanding any other provision of this regulation, if any failure to comply with the requirements of this regulation are particularly flagrant or egregious, the Owner may seek a termination for cause, a temporary suspension, a determination that the Contractor or Subcontractor is not responsible, debarment or bond revocation, and any other statutory, common law, or equitable remedy.

19 DE Reg. 207 (09/01/15)

SECTION 011100 - SUMMARY OF WORK

1. RELATED DOCUMENTS

A. 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

A. The work will be performed under separate prime contracts managed by the Construction Manager.

3. ALTERATIONS & COORDINATION

A. 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

A. 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.

B. 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.

C. 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.

D. 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.

E. 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

A. 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.

B. 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.

C. 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.

D. 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.

E. 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.

F. 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.

G. 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.

H. 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.

I. 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.

J. 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

A. 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.

B. 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.

C. 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.

D. 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 cleanup of their work.

E. Contractors are reminded that there are limited storage areas available on site. Off-site storage will be the responsibility of each individual Contractor. Neither the owner or construction manager will be charged additional costs for storage during the project.

F. 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.

G. 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.

H. All bids must include insurance limits in accordance with Article 11 of the Section 007300 SUPPLEMENTARY CONDITIONS.

I. Hoisting, scaffolding and material handling is the responsibility of each Contractor, unless otherwise noted.

J. Contractor will be responsible for layout of its own work. The Construction Manager will provide benchmark and layout of the building line.

K. 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.

L. Contractor Scopes of Work and Schedule are interrelated. Familiarity with each is required.

M. 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 004500 - QUALITY CONTROL.

N. Safety is the responsibility of each individual Contractor. The project will be governed under the guidelines of OSHA.

O. 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.

P. Coordination with other trades will be required. The Contractor will be required to 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.

Q. Contractor shall submit a schedule of values to the Construction Manager, through Building Blok Management System, prior to the submission of their first invoice for approval.

R. 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.

S. 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.

T. Contractor's License: Submit a copy of all business licenses required by local and state agencies.

U. 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.

V. 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.

W. Each individual Contractor will provide fine clean up on a daily basis. Fine cleaning will be defined as those means/methods utilized to ensure that all odors, dust, and debris will be non-existent within the project area at the end of each workday. In addition, means and methods shall be utilized that prevent the migration of odors, dust, debris, and excessive noise from migrating into non-working areas. An approved cleanup plan will be required before the initial start of the work. The construction manager reserves the right to stop the work, or any portion thereof, upon failure to provide the required cleaning. Contractors will be individually back charged by the Construction Manager for clean up not satisfactorily performed by the Contractor.

X. 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.

Y. 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.

Z. 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 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-startup of all systems should be performed by the Owner.

AA. NOT USED

AB. 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.

AC. Contractor is responsible for having a competent project superintendent/foreman on-site during all work performed under its contract.

AD. 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.

AE. 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.

AF. Contractor shall provide the necessary safety barricades and railings required to complete their work and comply with all OSHA, local code and contract specifications.

AG. Temporary Protection: Provide temporary protection to ensure that no damages occur to existing or new finishes, building components, materials, equipment, etc. In addition, provide all approved signage and safety devices applicable to the referenced temporary protection. An approved temporary protection plan will be required before the initial start of the work.

AH. All contractors will be responsible to review and be familiar with the classroom mock up; established to provide a level of expectation to the bidders during the bidding process.

AI. The contractor's shall be responsible for all quality control and the craftsmanship of the final products delivered.

AJ. Should any work not meet the expectations of the mock ups and the contract documents it will be rejected and replaced at the contractors cost.

AK. Contractors are expected to be present with their estimating team at the Pre-Construction meeting; this meeting with discuss the level of expectation expected by all contractors. These meetings are not mandatory; but you are responsible to view and understand the existing

conditions of the project before bidding

CONTRACT NO. HHS - 30 - DEMOLITION

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
Division 2	Existing Conditions
Section 01 9123	General Commissioning Requirements
Section 01 9125	Exterior Enclosure Commissioning
Section 02 4100	Demolition

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide all labor, material, trucking, equipment, hoisting, scaffolding, power, temporary facilities, permit fees, supervision, layout, clean up, etc. for the complete performance of all demolition work.

2. Demolition of roof to be performed by Contract HHS-40 Roofing.

3. This Contractor shall include all demolition and wrecking of the existing structures at the following location: 401 East 12th Street, Wilmington, Delaware 19801.

4. Coordinate your work with attached asbestos abatement report.

5. Demolish all structures and buildings and their appertains construction to new subgrade grade level. Fill in all depressions to new subgrade grade level including vaults and areaways beyond the face of the building. Fill shall consist of clean non-combustible material such as brick and other masonry debris in compliance with the City building code. Excess material to be removed from site in a legal manner. Fill must be clean common compactable fill or select material.

6. Remove from site all combustible material including, but not limited to wood, steel, iron, structural steel, and dispose of in a legal manner. No on site burning of material will be allowed at any time.

7. Remove from site concrete slabs on grade, hot mix paving, retaining walls (concrete and masonry) in a legal manner.

8. All foundation walls, areaway walls, vault walls, shop walls, yard walls shall be demolished to 1'0" below existing grade and filled of depression to subgrade with non-combustible fill material.

9. Items of demolition shall include, but not necessarily be limited to, complete structures, wall framing, masonry walls, structural steel, interior partitions, roofing, mechanical and electrical

equipment and fixtures, and related equipment.

10. Remove all concrete troughs completely including miscellaneous steel then fill all areas with stone fill to subgrade.

11. Remove all grease traps and associated piping.

12. Remove all oil and fuel storage tanks that are located within the structure in accordance will all City, State and Federal regulations.

13. Remove all concrete (including hot mix, brick and stone) curbs and sidewalks on as shown. Maintain all utilities.

14. This Contractor shall notify the Construction Manager immediately if hazardous materials (i.e. asbestos, lead, PCB's, etc.) are uncovered. At that time, all work in the affected area will be stopped until proper removal can be completed by others (i.e. hazardous material abatement contractor).

15. Temporary maintenance standby labor such as for temporary water, temporary power, temporary light and the like where required due to this Contractor's work is to be included within the Contract Price.

16. If this Project is to be constructed adjacent to existing buildings, this 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 buildings in the area.

17. This Contractor shall clean public streets and sidewalks daily. This Contractor shall collect and remove from the site daily all rubbish, scrap and other debris resulting from its operations.

18. This Contractor shall include in the Contract Price and unit prices, the cost of all police traffic details required for the execution of the Work.

19. All light, power, water and any other utilities, including special provisions for hookups to same for this Contractor's operations will be provided by this Contractor within the Contract Price and unit prices.

20. This Contractor shall comply with all Federal, State and local laws requiring noise control and hours which work is to be conducted. Mufflers, "whisperized" compressors, etc., shall be used as required for compliance with laws and ordinances throughout the course of the Work.

21. It is understood that all Work under this Contract shall be in strict accordance with the Building Code with the City, State and any other agency having jurisdiction. In the event of any conflict in any provisions of any regulatory agency and Contract Documents, the more stringent requirements shall apply.

22. This Contractor is aware of the structural capacities of various portions of the structure. Cranes, materials, deliveries and material storage, shall not exceed rated capacities without this Contractor taking appropriate steps to compensate for the imposition of loads which may exceed the design criteria and which are imposed solely by this Contractor's operations.

23. This Contractor shall provide any and all "fire watch" personnel required due to the Contractor's cutting, burning, welding or other open flame activity.

24. This Contractor shall submit proposed methods and operations of building demolition to the Owner, his representative or agents for review prior to the start of work, including a schedule of coordinating the shut off, capping and/or continuation of utility services as required.

25. This Contractor shall visit the site of the proposed work, fully acquaint and familiarize himself with the conditions as they exist and the character of the operations to be carried out under the proposed Contract, and make such investigation as he may see fit so that he shall fully understand the facilities, physical conditions and restrictions affecting the work under the Contract. Claims for additional compensation and/or extensions of time because of Contractor's failure to familiarize himself with all conditions which might affect the work shall not be allowed.

26. Before proceeding with the demolition work, this Contractor shall obtain a permit from the City, protect all public sidewalks, streets or thoroughfares and all property adjacent to the site as required by such codes, ordinances, rules and regulations, including, but not limited to, scaffolding, sidewalk bridges, fences, barricades, aprons, warning signs and lights.

27. This Contractor, before commencement of any part of the Work, shall give any notices, required to be given to an adjoining landowner and other parties.

28. This Contractor, in the performance of the Work under his subcontractor, shall maintain all required means of egress from the existing buildings and alter such stairs, platforms and fire escapes as required to satisfy all agencies having jurisdiction.

29. Before demolition work is started, existing sewer, water, gas and other service lines to the existing buildings shall be shut off, disconnected and capped or plugged in accordance with the requirements of the utility companies or other authorities having jurisdiction. This Contractor shall notify all such authorities in advance and obtain their approval and cooperation in shutting off utilities. All costs in connection with disconnecting utilities shall be borne by this Contractor.

30. This Contractor shall take special precautions to shore, brace, support or relocate any utility lines as may be required to satisfy all agencies having jurisdiction.

31. Any existing piping, subsoil drainage systems, conduit, manholes, tanks, catch basins, etc., which are abandoned shall be plugged with concrete and to the extent within or beneath the limits of excavation, removed. All others are to be maintained and repaired or otherwise restored to proper operating condition.

32. This Contractor shall, in cooperation with utility companies, remove or cause to be removed all light and power poles if required to be removed, at such time as the services utilizing said poles are no longer required.

33. If required, this Contractor shall relocate power or light poles, fire hydrants, traffic signs or signals and similar utility and public service items in use and shall cooperate with all governmental agencies having jurisdiction over such items so as not to interfere with the services of such governmental agencies.

34. Street openings made for the shutting off or tapping of utility lines or for any other purpose shall be backfilled, tamped and the surfaces restored in accordance with the requirement of applicable local codes or to match existing; whichever is greater.

35. Existing services to remain will be defined by the Owner prior to or immediately after the start of demolition work.

36. Utility equipment belonging to the utility companies, if to be retained by these companies, will be removed from the site by the company owning the equipment upon notification by this Contractor.

37. This Contractor shall make a careful examination of the structures to be demolished and the adjoining property and utilities which are to remain; take whatever precautions are necessary and carry on operations so as to prevent personal injury and any settlement, collapse, damage from falling debris or other causes to adjacent building.

38. Any damage to public property, private property, or to utilities due to demolition operations, or the Contractor's neglect, shall be corrected by this Contractor, in a manner approved by the Owner and the parties whose property has been damaged, all at no additional cost to the Owner.

39. Miscellaneous equipment and furnishings belonging to the Owner, if to be retained by the Owner, will be removed before the commencement of the demolition work. All other equipment or furnishings attached, remaining, in the building at the start of the demolition work shall become the property of this Contractor and shall be removed and disposed of by this Contractor.

40. All equipment, materials and debris shall be regularly removed by this Contractor from the Site as work progresses in such manner as not to create a nuisance, and shall be disposed of by this Contractor at his own expense, at locations to be determined by this Contractor. Permits required in connection with the disposal of the materials shall be obtained by this Contractor. Disposal shall be in accordance with all Federal, State and local laws, rules, codes, orders and regulations.

41. Materials and equipment to be salvaged or which have been sold to others by this Contractor must be promptly removed by this Contractor, and shall not be stored at the site. The offering, advertising, display or sale of materials and equipment will not be permitted.

42. Contractor shall remove debris promptly and will not burn anything on the site. Contractor shall keep required fire extinguishing equipment in serviceable condition, properly distributed so that it will be available for immediate use, particularly during any acetylene cutting operations. This Contractor shall afford adequate facilities for inspection by, and carry out the recommendations of, the local Fire Department. This Contractor shall maintain one fire riser during demolition.

43. This Contractor shall, prior to the start of Work, provide the name and location of proposed dump site to receive the demolition debris. Dump site must be licensed and acceptable to all local government agencies having jurisdiction.

44. This Contractor shall provide signed and stamped dump site debris tickets identifying the location, date, time and quantity of debris deposited at the dump site.

45. This contract contains the demolition related to the Phase I portion of the project; it is expected that you will begin work in early June of 2016. The demolition of the exterior structures and attachments will require a crew to start work immediately. A second crew will be required to begin interior demolition at the same time. Multiple crews will be required from July 2016 – August 2016. The Annex demolition and bus level main building demolition all to commence in June and with multiple crews.

46. Coordination with the MEP trades will be required; include a minimum of 3 remobilization in your bid for the interior demolition.

47. All debris will be removed from the site daily; recycling of materials should be required to meet LEED/State regulations.

48. All saw cutting of floors, walls and roof deck will require a pre-approved saw cut layout shop drawing.

49. This contract requires all gas, diesel powered equipment to be equipped with "air scrubbers" per OSHA standards.

50. All areas of demolition shall be kept in a safe working manner at all times; include in your proposal all measures that may be required to provide a safe working area at all times.

51. This contractor shall be responsible to remove all electrical, mechanical and other piping from the project site. The Electrical and Mechanical contractor will cut, cap and safe off all equipment, piping, conduits etc. This contractor to remove and take off site.

52. Existing floor slabs have been cored to allow this contractor to review existing conditions for the basis of bid preparations.

53. This contractor to include an allowance of $75,000 for work associated with unknown substrates.

54. This contractor to include an allowance of $75,000 to be used at the discretion of the Construction Manager.

55. This contractor to include starting some of the interior demolition by May, 15, 2017. This work will be necessary to facilitate the asbestos abatement and contract. Included three (3) additional mobilizations to accommodate this work.

"FOR REFERENCE ONLY"

SECTION 01013 - SUMMARY OF THE WORK - ASBESTOS ABATEMENT

PART 1) - GENERAL

a) RELATED DOCUMENTS

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

b) WORK COVERED BY CONTRACT DOCUMENTS

i) **The Project** consists of the removal and disposal of asbestos-containing material and lead-glazed ceramic tile from the Howard High School – 1927 Building First & Second Floor Areas.

(1) **Project Location:** 1300 Clifford Brown Walk, Wilmington, Delaware.
(2) **Owner:** New Castle County Vocational Technical School District

ii) **Contract Documents**, dated November 17, 2016 were prepared for the Project by Environmental Testing, Inc., 100 South Cass Street, Middletown, Delaware.

iii) **The Work** consists of the removal and disposal of the following asbestos-containing building materials (Table (i) & Lead Glazed ceramic tile (Table (ii):

Table 1
Summary of Asbestos-Containing Building Materials (ACBM)
For 2017

Asbestos-Containing Material	Location	Approximate Quantity
12" floor tile and mastic	First Floor Second Floor	2,345 SF 3,905 SF
asbestos concrete under wood flooring	First Floor Second Floor	12,570 SF 11,280 SF
Asbestos Pipe Insulation (Assumed)	Inside Bathroom walls	30 LF
Transite Fume Hood	Room N208	1 Fume Hood

See attached Drawings for location of asbestos materials and abatement containment areas for 2017.

Table 2
Summary of Lead-glazed Ceramic Tile in Bathroom areas
For 2017

Lead-Glazed Ceramic Tile	Location	Approximate Quantity
First Floor Bathroom	Office	110 SF
Second Floor Bathrooms	Women's Rest Room Teacher's Lounge Rest Room	240 SF 120 SF

No Work can be started by the contractor until the Delaware Project Monitor is on site.

Asbestos/Lead Glazed Tile Work Area Set-up: Danger signs and notifications will be posted prior to the start of removal as outlined in the specification.

Provide a three-stage decontamination chamber with hot and cold shower for workers and others use as per Section 01563. Note: suggested locations for the decontamination units are provided on the attached drawings. Provide a separate waste decontamination unit as per Section 01563. Note: Disposable "Pop-up" decontamination units will not be allowed for use in major setup areas. Also, disposable decontamination units are meant for one-time use and shall not be reused.

Provide worker protection as per Section 01560 and respiratory protection as per Section 01562 and 01556. A minimum level of respiratory protection of a Powered Air-Purifying Respirator (PAPR) is required for all work on this project.

Provide air filtration units with HEPA filters as per Section 01513 in sufficient number to achieve four air changes per hour. Pressure differential units shall be installed, with one backup unit, sufficient to achieve -0.02" H_2O pressure differential as indicated by strip chart manometer.

Critically seal with two layers of six-mil poly and duct tape all penetrations and non-moveable objects in the work area as per Section 01526.

Construct full containment enclosure (1 layer of 6-mil polyethylene) on wall surfaces of floor tile areas requiring abatement as per Section 01526. Construct full containment enclosure (2 layers of 6-mil polyethylene) on wall & ceiling surfaces of all wood floor areas with subfloor asbestos concrete as per Section 01526. **Note: In bathroom areas having lead-glazed ceramic tile on wall surfaces, cover all wall**

surfaces not covered by ceramic tile with one layer of 6-mil polyethylene plastic.

Prior to abatement, a pre-abatement inspection will be performed by the Owner's Representative to ensure compliance with specifications.

A final visual inspection and final clearance air testing for asbestos as per AHERA requirements will be performed by the Owner's Representative following abatement in each interior containment work area.

***Vinyl Floor Tile & mastic*:** Remove all cove-base molding without damaging walls. Following work area setup of decontamination unit, covering of wall surfaces and installation of air filtration system remove floor tile and mastic as per Section 02087.

Lead-glazed Ceramic Tile: Following work area setup as descrived above, **r**emove lead-glazed ceramic tile inside designated bathroom areas. This work should be isolated and separately contained within the asbestos work area and cleaning and wipe testing of lead levels shall be conducted prior to initiation of asbestos work. The ceramic tile and lead debris will be recovered and properly disposed. Prior to clearance testing, a visual inspection will be conducted by ETI to ensure that surface dust has been properly removed. Clearance wipe testing will then be conducted to ensure that the areas have been properly decontaminated. Following EPA criteria, work area surfaces will be decontaminated to a clearance level of 40 micrograms per square foot. Prior to disposal, the ceramic tile debris will be tested by TCLP for determination as Hazardous Waste.
The contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.

The contractor is responsible for providing medical examinations and maintaining medical records of personnel (see Section 01555) as required by the applicable Federal, State and local regulations (see Sections 01093 and 01094). The contractor shall hold the Owner, construction manager, general contractor, and Environmental Testing, Inc. harmless for failure to comply with any applicable work, hauling, disposal, safety, health, or other regulation on the part of himself, his employees or his subcontractors.

The contractor shall comply with all aspects of the construction industry lead standard (29 CFR 1926.62) including the following:

1) exposure assessment;

2) protection of employees during assessment of exposure.

The employer shall implement engineering and work practice controls, to reduce and maintain employee exposure to lead to or below the permissible exposure limit inside the work area and to prevent contamination of clean areas outside the work area. These methods shall include use of wet methods and proper work practices, work area containment, HEPA vacuuming, and proper decontamination of workers and work sites.

If methods differ from the described methods or if more detail is required to comply with the requirement of the OSHA Lead Standard (29 CFR 1926.62) submit a detailed job-specific plan of the procedures proposed for use in complying with the requirements of this specification as per the construction industry lead standard (29 CFR 1926.62; see Section 01555 1.9). Include in the plan the location, size, layout and details of the work areas. Include the sequencing of work, the interface of trades involved in the performance of work methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location of approved disposal site (if waste is characterized as Hazardous Waste based on testing by the Toxicity Characteristic Leachate Procedure-TCLP), and a detailed description of the methods to be employed to control pollution. Method of removal to reduce lead dust generation in the work area, and packaging of removed lead paint, dust and debris. Describe the methods that will be used to comply with OSHA

requirements including submission of exposure monitoring to demonstrate adequacy of respiratory and worker protection equipment selected. The plan must be approved prior to commencement of work.

Wood Floor & Subfloor Asbestos Concrete (Gypcrete): Construct full containment enclosure (2 layers of 6-mil polyethylene) on wall & ceiling surfaces of all wood floor areas and adjoining hallways in which floor tile is to be abated. Remove all surface wood flooring in each room adjacent to hallway areas. Dispose of wood flooring in contact with "gypcrete" as ACM waste. Following removal of all wood debris, encapsulate "gypcrete" floors with the following:

Fiberlock Technologies, Inc. Asbestos Binding Compound (ABC)

Fiberlock's Technical Representative: Mike Dekker (732) 530-8965
Material supplier: Aramsco (800) 767-6933: Denise, Sales Mgr.

See abatement drawings for location of 2017 work.

Waste Disposal: All waste (unless otherwise stated) will be double bagged and placed in fiberboard drums for disposal. Waste will be disposed of according to NESHAP and State of Delaware regulations as per Section 02084. Package material for disposal in drums in such a manner that the material is not exposed by punctures, rips, tears, etc.through the disposal bags.

Emergency Criteria: The Contractor must inform all pertinent authorities such as police, ambulance and fire department of the scheduled work. A list of authorized personnel and telephone numbers shall be kept in the log book and also be posted if possible. This includes local police, ambulance and fire department addresses and telephone numbers.

Other Criteria: The Contractor is responsible for the integrity and security of the contained area and shall make arrangements with the Owner's Representative to maintain the security. In addition he must exchange emergency telephone numbers in case of a problem.

Notifications: Ten work day notifications are required to EPA Region III as well as to the State of Delaware Department of Natural Resources and Environmental Control (DNREC).

Certifications: All Contractors, workers and supervisors must be State of Delaware Certified.

c) WORK UNDER OTHER CONTRACTS

i) **Cooperate** fully with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

d) WORK SEQUENCE

i) **The Work** will be conducted beginning in May 2017 in the 2nd and 3rd floor areas of the Howard High School 1927 Building.

e) ASBESTOS-CONTAINING MATERIALS:

i) The Work of this contract involves activities that will disturb asbestos-containing materials (ACM) or presumed asbestos-containing materials (PACM). The location and type of ACM known to be present at the worksite is set forth in the drawings. If any other ACM or PACM is found, notify the owner, other employers and employees the about the location and quantity of the ACM or PACM within 24 hours of the discovery.

f) ASBESTOS HEALTH RISK:

i) The disturbance or dislocation of ACM may cause asbestos fibers to be released into the building`s atmosphere, thereby creating a potential health risk to workers and building occupants. Apprise all workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the risk and of proper work procedures which must be followed.

ii) Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified ACM, take appropriate continuous measures as necessary to protect all building occupants from the risk of exposure to airborne asbestos. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.

g) CONTRACTOR USE OF PREMISES

i) Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

(1) Owner Occupancy: Allow for Owner occupancy and use by the public.

(2) Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times.

Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

ii) **Use of the Existing Building:** Maintain the existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

(1) **Smoking:** Smoking or open fires will not be permitted within the building enclosure or on the premises.

(2) **Toilet Rooms:** Except for toilet rooms designated for use by the Contractor's personnel, use of existing toilets within the building, by the Contractor's personnel, will not be permitted.

h) OCCUPANCY REQUIREMENTS

i) **Partial Owner Occupancy:** The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

i) AIR MONITORING BY THE OWNER:

i) **The Owner has contracted for air monitoring.** Air monitoring may be conducted both outside and inside of the work area during the work, and for clearance sampling at the end of the project

(1) **Outside of the Work Area:** The Owner's air monitoring firm may sample air outside of the work area to detect faults in the work area isolation such as:
(a) Contamination of the building outside of the work area with airborne asbestos fibers,

(b) Failure of filtration or rupture in the differential pressure system,
(c) Contamination of air outside the building envelop with airborne asbestos fibers.

(2) Inside the Work Area: The Owner's air monitoring firm may monitor airborne fiber counts in the Work Area. The purpose of this air monitoring is to detect airborne asbestos concentrations which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

ii) Work area clearance: Clearance air sampling by the Owner's air monitor at the completion of asbestos abatement work is described in Section 01711 Project Decontamination.

iii) Air monitoring required by OSHA is work of the Contractor and is not covered in this section

j) SCHEDULE OF AIR SAMPLES BY OWNER:

i) Sample cassettes: Samples will be collected on 25 mm. cassettes as follows:

(1) PCM: 0.8 micrometer mixed cellulose ester.

(2) TEM: 0.45 micrometer mixed cellulose ester or 0.40 micrometer polycarbonate, with 5.0 micron mixed cellulose ester backing filter.

ii) Number and Volume of Samples: The number and volume of air samples given in the schedules is approximate. The exact number and volume of samples collected by the Owner may vary depending upon job conditions and the analytical method used.

iii) Sample Volume and Sensitivity:

(1) PCM: The sample volumes collected by the Owner's air monitor will be determined by the following formula:

Volume = (Number of fibers) X Total Filter Area

$$\frac{\text{(Area of 100 fields)}}{\text{(Limit Value)}}$$
4

Where:

Number of fibers = 5 fibers/100 fields, based on a limit of detection (LOD) of 7 fibers/mm^2 on the filter
Area of 100 fields = 0.785mm^2
Total Filter Area = 385mm^2
Limit Value = as specified in the schedules of samples below

(a) For purposes of this specification, the sample volume calculated above will be considered to be of sufficient size so that there is a 95% level of confidence that the value measured by each individual sample at the limit of detection (LOD) is less than or equal to the limit values specified below.

(b) For purposes of this specification, the Limit of Detection (LOD) is defined as 7 fibers/mm^2 on the filter or 5 fibers/100 fields.

(c) For purposes of this specification overloaded samples will be considered as exceeding the applicable limit value.

(2) **TEM:** Analytical Sensitivity of 0.05 structures/cc as set forth in the AHERA regulation.

iv) Base Line:

(1) **Before Start of Work:** The Owner will secure air samples to establish a base line.

(2) **PCM Samples**

Location Sampled	Number of Samples	Limit of Detection (Fibers/cc)	Volume (Liters)	Flow Rate (Liters/ Minute)
Each Work Area	5	0.01	*<1,000>*	1-10
Outside Each Work Area	5	0.01	*<1,000>*	1-10
Outside Building	5	0.01	*<1,000>*	1-10

(3) TEM Samples:

Location Sampled	Number of Samples	Analytical Sensitivity (Struct./cc.)	Volume (Liters)	Rate (Liters/ Minute)
Each Work Area	1	0.005	1,300	1-10
Outside Each Work Area	1	0.005	1,300	1-10
Outside Building	1	0.005	1,300	1-10

(4) Base Line: a level expressed in fibers per cubic centimeter which is twenty-five percent greater than the largest of the following:

(a) Average of the PCM samples collected outside each Work Area
(b) Average of the PCM samples collected outside the building
(c) 0.01 fibers per cubic centimeter

(5) Samples collected for TEM analysis will be held without analysis. These samples will be analyzed under the conditions and terms set forth in "Fibers Counted" and "Affect On Contract Sum".

v) Daily:

(1) From start of work of Section 01526 Temporary Enclosures through the work of Section 01711 Project Decontamination, the Owner may take samples.

(2) Sample volume and sensitivity: inside the work area may vary depending upon conditions in the work area. If samples are overloaded at the sample volume required for a limit value equal to the "Stop Action Levels" or "Immediate Stop Action Levels" given later in this section, the level is considered to have been exceeded.

(3) PCM Samples:

Location Approx.	Number of	Detection Limit	Volume (Liters)	Flow Rate

	Samples	(Fibers/cc)		(Liters/min)
Each Work Area	2	*<0.1>*	*<100>*	1-10
Outside Each Work Area at Critical Barrier	1	0.01	*<1,000>*	1-10
Clean Room	1	0.01	*<1,000>*	1-10
Equipment Decon	1	0.01	*<1,000>*	1-10
Outside Building	1	0.01	*<1,000>*	1-10
Output of Pressure Differential System	1	0.01	*<1,000>*	1-10

vi) **Additional samples** may be taken at Owner's or Designer's discretion. If airborne fiber counts exceed allowed limits additional samples may be taken as necessary to monitor fiber levels.

k) ANALYTICAL METHODS USED BY THE OWNER:

i) The following methods will be used by The Owner in analyzing filters used to collect air samples. Sampling rates may be varied from printed standards to allow for high volume sampling.

(1) Phase Contrast Microscopy (PCM) will be performed using the NIOSH 7400 method.

(2) Transmission Electron Microscopy (TEM) will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A.

l) LABORATORY TESTING BY OWNER:

i) **The services of a testing laboratory** may be employed by the Owner to perform laboratory analyses of the air samples. A

microscope and technician will be set up at the job site, or samples will be sent overnight on a daily basis, so that verbal reports on air samples can be obtained within 24 hours. The Contractor will have access to all air monitoring tests and results.

ii) **The Contractor will have access** to all air monitoring tests and results upon request.

iii) **Written Reports:** of all air monitoring tests will be posted at the job site on a daily basis.

m) FIBERS AND STRUCTURES

i) **Fibers Counted:** The following procedure will be used to resolve any disputes regarding fiber types when a project has been stopped due to excessive airborne fiber counts.

(1) **Large Fibers:** "Airborne Fibers" referred to above include all fibers regardless of composition as counted by phase contrast microscopy (PCM), unless additional analysis by transmission or scanning electron microscopy demonstrates to the satisfaction of the Designer that non-asbestos fibers are being counted. "Airborne Fibers" counted in samples analyzed by transmission electron microscopy shall be asbestos fibers, greater than 5 microns in length. For purposes of stop action levels, subsequent to analysis by electron microscopy, the number of "Airborne Fibers" shall be determined by multiplying the number of fibers, regardless of composition, counted by PCM by the proportion of fibers that are asbestos as determined by TEM (a number equal to, asbestos fibers counted, divided by all fibers counted in the electron microscopy analysis).

n) ADDITIONAL TESTING:

i) **The Contractor may conduct** air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner.

o) PERSONAL MONITORING:

i) Owner will not perform air monitoring for the Contractor to meet Contractor's OSHA requirements for personal sampling or any other purpose.

PART 2) - PRODUCTS (Not Applicable)

PART 3) - EXECUTION

a) STOP ACTION LEVELS:

i) Inside Work Area: Maintain an average airborne count in the work area of less than the Stop Action Level given below for the type of respiratory protection in use. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. If the Time Weighted Average (TWA) fiber count for any work shift or 8 hour period exceeds the Stop Action Level, stop all work except corrective action, leave pressure differential and air circulation system in operation and notify Designer. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Designer.

STOP ACTION LEVEL (f/cc)	IMMEDIATELY STOP LEVEL (f/cc)	MINIMUM RESPIRATOR REQUIRED	PROTECTION FACTOR
0.5	2.5	PAPR	1000
1.0	5.0	Supplied Air Pressure Demand	10,000

(1) If airborne fiber counts exceed Immediate Stop Level given above for type of respiratory protection in use for any period of time cease all work except corrective action.

Notify Designer. Do not recommence work until fiber counts fall below Stop Action Level given above for the type of respiratory protection in use. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Designer.

ii) Outside Work Area: If any air sample taken outside of the Work Area exceeds the base line established in Part 1 of this section, immediately and automatically stop all work except corrective action. The Designer will determine the source of the high reading and so notify the Contractor in writing.

(1) If the high reading was the result of a failure of Work Area isolation measures initiate the following actions:

(a) Immediately erect new critical barriers as set forth in Section 01526 Temporary Enclosures to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (e.g. wall, ceiling, floor).

(b) Decontaminate the affected area in accordance with Section 01712 Cleaning & Decontamination Procedures.

(c) Require that respiratory protection as set forth in Section 01562 Respiratory Protection be worn in affected area until area is cleared for re-occupancy in accordance with Section 01711 Project Decontamination.

(d) Leave Critical Barriers in place until completion of work and insure that the operation of the pressure differential system in the Work Area results in a flow of air from the balance of the building into the affected area.

(e) If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a decontamination facility consisting of a Shower Room and Changing Room as set forth in Section 01563 Decontamination Units at entry point to affected area.

(f) After Certification of Visual Inspection in the Work Area remove critical barriers separating the work area from the affected area. Final air samples will be taken within the entire area as set forth in Section 01711 Project Decontamination.

(2) If the high reading was the result of other causes initiate corrective action as determined by the Designer.

iii) **Effect on Contract Sum:** Complete corrective work with no change in the Contract Sum if high airborne fiber counts were caused by Contractor's activities. The Contract Sum and schedule will be adjusted for additional work caused by high airborne fiber counts beyond the Contractor's control.

b) STOP WORK:

i) **If the Owner or the Project Administrator** presents a written stop work order, immediately and automatically conform to that stop work order, while maintaining temporary enclosures and pressure differential.

ii) **Immediately initiate the following actions:** After being presented with a stop work order immediately:
(1) Cease all asbestos removal activities, or any other activities that disturbs ACM.
(2) Repair any fallen, ripped or otherwise failed work area isolation measures.
(3) Maintain in operation all work area isolation measures including those required by Sections 01526 "Temporary Enclosures," 01513 "Temporary Pressure Differential & Air Circulation System," 01563 "Decontamination Units."
(4) Maintain all worker protections including those required by Sections 01560 "Worker Protection - Asbestos Abatement," and 01562 "Respiratory Protection."
(5) Fog the air in the work area with a mist of amended water to reduce airborne fiber levels.

iii) **Do not recommence work** until authorized in writing by the Owner or Designer.

ASBESTOS-CONTAINING BUILDING MATERIALS:

Item/Location	Estimated Quantity	Asbestos Content	Other Components
12" Floor Tile/mastic	6,215 SF	2%-6%/2-6%% Chry	Binder
Pipe Insulation (inaccessible) Bathrooms	30 LF	Assumed ACBM	Binder
Asbestos Subfloor Gypcrete	22,175 SF	6-10% Chry	Binder

Notes: see attached field drawings for sample locations.

END OF SECTION - 01013

"FOR REFERENCE ONLY"

HOWARD HIGH SCHOOL FLOOR CONDITIONS
(WHERE OBSERVED DURING SAMPLING)

FLOOR	ROOM/AREA	OBSERVED CONDITION
1st Floor	N101 Closet	½" Wood over ¾ " Wood / ACM Concrete
	N102	Cork Flooring /Wood/ ACM Concrete
	N103	¾" Wood/ ACM Concrete
	N104	¾" Wood/¾" Wood/ ACM Concrete
	N106	¾" Wood/ ACM Concrete
	101	2 layers of Wood/ ACM Concrete
	102	2 layers of Wood/ ACM Concrete
	103	2 layers of Wood/ ACM Concrete
	104	1 layer of Wood/ ACM Concrete
	105	2 Layers of Sheet vinyl, 1 Layer of Wood/ ACM Concrete
	107	1 Layers of Sheet vinyl, 1 Layer of Wood/ ACM Concrete
2nd Floor	S1 (NE Room)	3/8" wood/1/4" Luan/3/4" Wood/ ACM Concrete
	N205	Floor Tile/Wood/ ACM Concrete
	N207	¾" Wood/ ACM Concrete
	N208	¾" Wood/ ACM Concrete
	N209	¾" Wood/ ACM Concrete
	N210	¾" Wood/ ACM Concrete
	N211	¾" Wood/ ACM Concrete
	N212	¾" Wood/ ACM Concrete

"FOR REFENCE ONLY"

15-176 Howard High School, 1927 Building, 1300 Clifford Brown Walk, Wilmington, DE

Photo 1: Photo of white lead glazed wall tile and black lead glazed tile trim.

"FOR REFENCE ONLY"

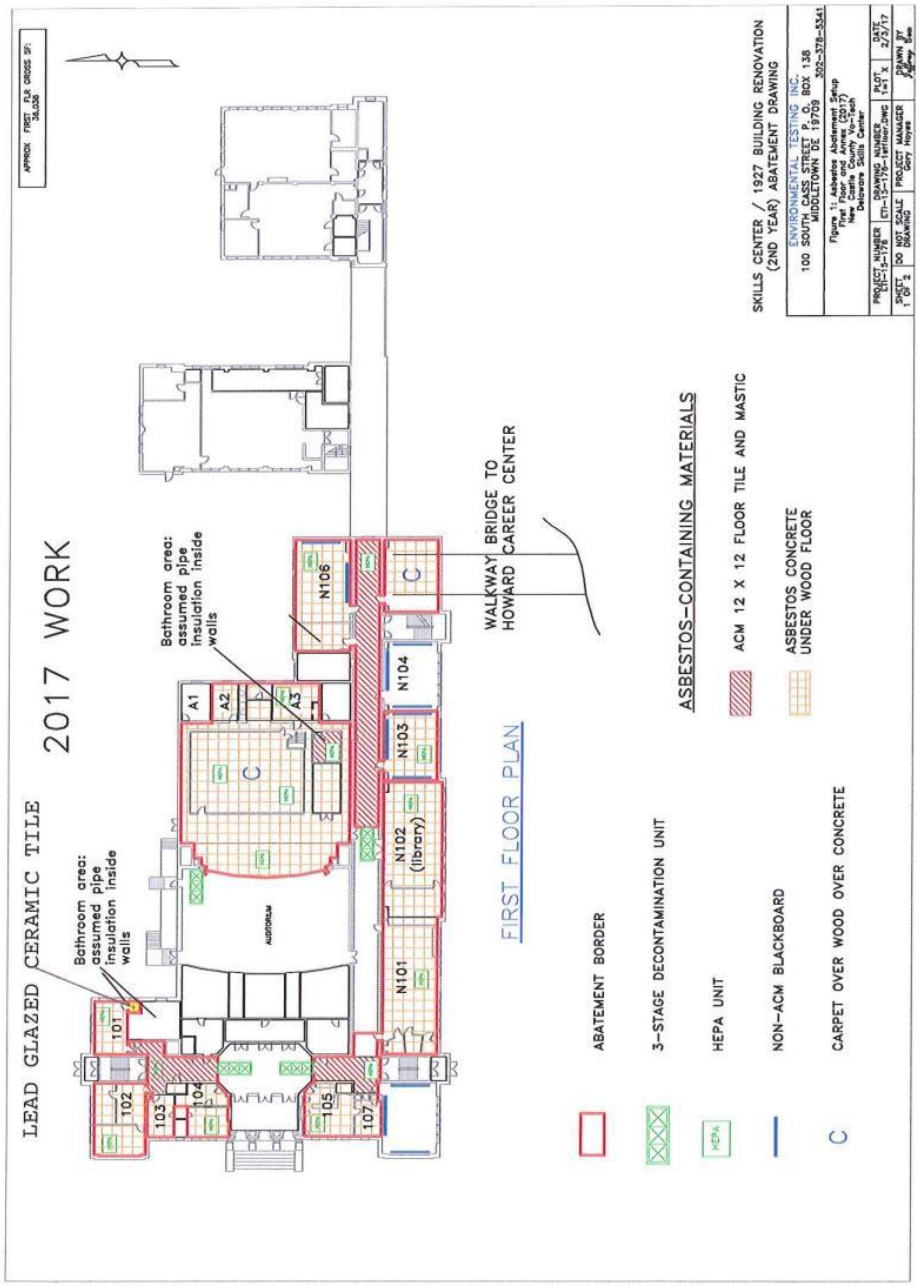
15-176 Howard High School, 1927 Building, 1300 Clifford Brown Walk, Wilmington, DE

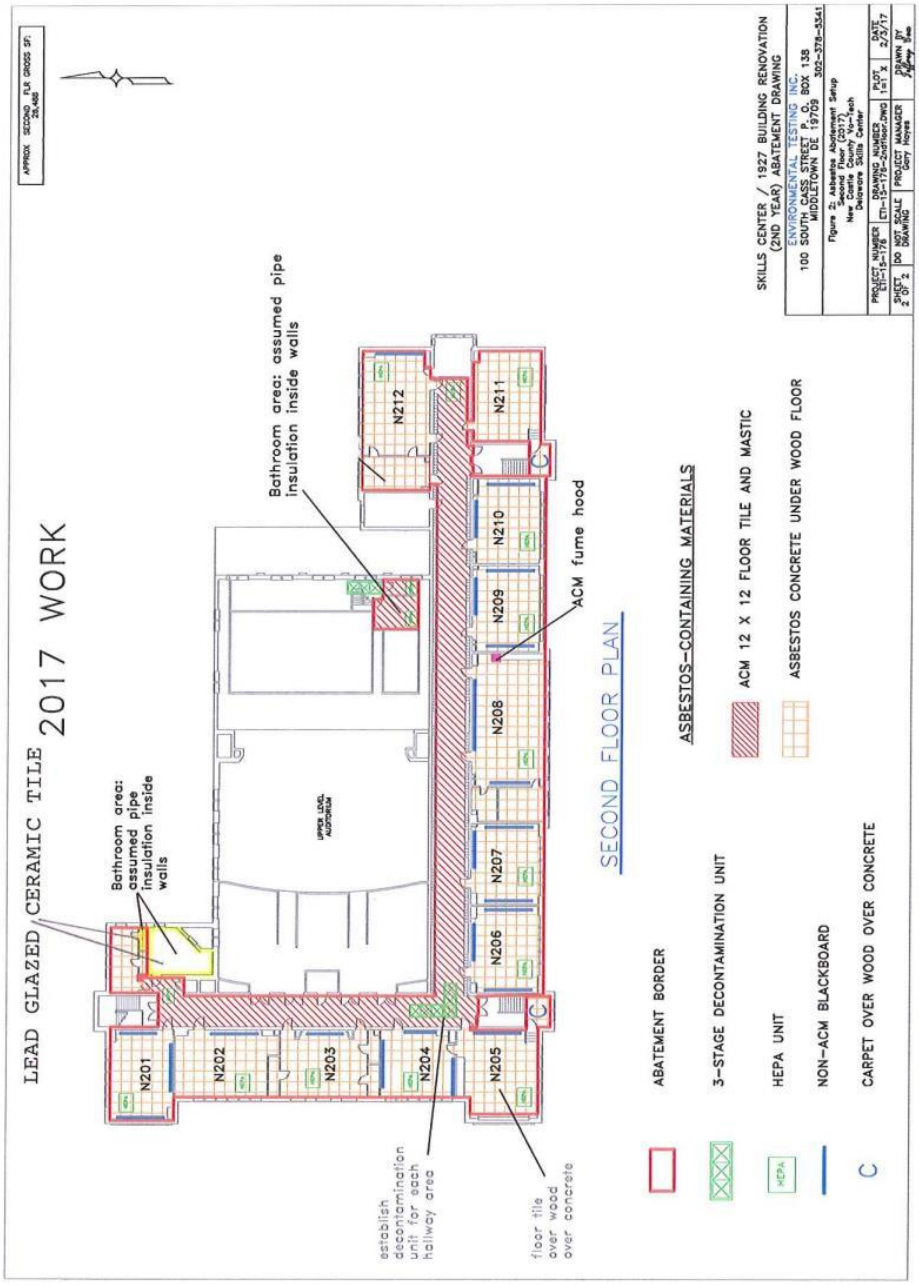
Photo 2: Photo of white lead glazed wall tile in the teacher's lounge restroom on the second floor.

"FOR REFENCE ONLY"

15-176 Howard High School, 1927 Building, 1300 Clifford Brown Walk, Wilmington, DE

Photo 3: Photo of white lead glazed wall tile in the office restroom located on the first floor.


LEAD GLAZED CERAMIC TILE 2017 WORK
Bathroom area: assumed pipe insulation inside walls
Bathroom area: assumed pipe insulation inside walls
101
102
103
104
105
107
A1
A2
A3
C
AUDITORIUM
N101
N102 (library)
N103
N104
N106
C
WALKWAY BRIDGE TO HOWARD CAREER CENTER
FIRST FLOOR PLAN
ASBESTOS-CONTAINING MATERIALS
ACM 12 X 12 FLOOR TILE AND MASTIC
ASBESTOS CONCRETE UNDER WOOD FLOOR
ABATEMENT BORDER
3-STAGE DECONTAMINATION UNIT
HEPA UNIT
NON-ACM BLACKBOARD
CARPET OVER WOOD OVER CONCRETE
HEPA
C
SKILLS CENTER / 1927 BUILDING RENOVATION
(2ND YEAR) ABATEMENT DRAWING
ENVIRONMENTAL TESTING INC.
100 SOUTH CASS STREET P. O. BOX 138
MIDDLETOWN DE 19709 302-378-5541
Figure 11: Asbestos Abatement Setup
Howard High School Area (2017)
New Castle County Vo-Tech
Delaware Skills Center
PROJECT NUMBER
ETI-2016-1
DRAWING NUMBER
ETI-2016-1-FIGURE-11.DWG
PLOT
1x1 X
DATE
2/9/17
SHEET
1 OF 2
DO NOT SCALE
DRAWING
PROJECT MANAGER
Gary Howes
DRAWN BY


LEAD GLAZED CERAMIC TILE 2017 WORK
Bathroom area: assumed pipe insulation inside walls
Bathroom area: assumed pipe insulation inside walls
ACM fume hood
N201
N202
N203
N204
N205
N206
N207
N208
N209
N210
N211
N212
UPPER LEVEL AUDITORIUM
establish decontamination unit for each hallway area
floor tile over wood over concrete
SECOND FLOOR PLAN
ASBESTOS-CONTAINING MATERIALS
ACM 12 X 12 FLOOR TILE AND MASTIC
ASBESTOS CONCRETE UNDER WOOD FLOOR
ABATEMENT BORDER
3-STAGE DECONTAMINATION UNIT
HEPA UNIT
NON-ACM BLACKBOARD
CARPET OVER WOOD OVER CONCRETE
SKILLS CENTER / 1927 BUILDING RENOVATION (2ND YEAR) ABATEMENT DRAWING
ENVIRONMENTAL TESTING INC.
100 SOUTH CASS STREET P.O. BOX 138
MIDDLETOWN DE 19709 302-378-5541
Figure 2: Asbestos Abatement Setup
Second Floor (2017)
New Castle County Vo-Tech
Delaware Skills Center
PROJECT NUMBER
DETT-D-5-79B
DRAWING NUMBER
CTH-D5-1-TB-2nfloor.DWG
PLOT SCALE
1=1'x
DATE
2/3/17
SHEET
2 OF 2
DO NOT SCALE DRAWING
PROJECT MANAGER
DCT Hayes
DRAWN BY
Jeffrey Poe

CONTRACT NO. HHS - 31 - CONCRETE

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
Division 2	Existing Conditions
Division 3	Concrete
Section 01 9123	General Commissioning Requirements
Section 01 9125	Exterior Enclosure Commissioning
Section 03 0510	Concrete Moisture Vapor Reduction Admixture (MVRA)
Section 03 3000	Cast-In-Place Concrete
Section 03 3511	Concrete Floor Finishes
Section 07 1300	Sheet Waterproofing
Section 07 2616	Under-Slab Vapor Barrier/Retarder
Section 07 9200	Joint Sealants

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide all form work, concrete, reinforcement, excavation, etc. required to complete. The concrete work per Contract Documents.

2. Section 03 3511 Concrete Floor Finish to be provided by this Contract.

3. Install all embedments including, but not limited to, anchor bolts, plates, etc.

4. Pumping of open excavations and maintenance is part of this contract.

5. Provide miscellaneous excavation.

6. Backfilling is the responsibility of this Contractor. Provide imported select material or stone as required to establish suitable subgrade as part of your base bid. Establishment of subgrade and additional fill material shall be part of this contract.

7. 95% compaction on soils required before placing concrete.

8. Coordinate all work with other prime Contractors.

9. This Contractor owns all floor slab replacement as well as mechanical and electrical equipment pads noted on contract documents.

10. Provide concrete foundations, slabs on grade, slabs on deck and all reinforcing steel.

11. This Contractor to supply and install all stone subbase as part of this Contract's base bid.

12. This Contractor will be responsible for laying out all concrete work as shown on the structural and architectural drawings.

13. This Contractor to furnish and install reinforcing steel, admixtures, curing compound, sealers as required in the Contract Documents.

14. Perimeter insulation at foundation walls if required.

15. Underslab vapor barrier, insulation, reglets, waterstops, control and construction joints (including required caulking at control and construction joints).

16. Placement of related items furnished under other Specification Sections.

17. Anchor bolts and leveling plates to be installed by this Contractor and furnished by the Structural Steel contractor. Installation within required tolerances. Anchor bolt assemblies to be placed with templates only. Contractor shall supply as-built drawings to steel erector for coordination prior to steel placement.

18. All blockouts and embedments required by plans and specifications.

19. This Contractor to furnish and install all sleeves for incoming utilities at the perimeter walls.

20. This Contractor is responsible for grouting all structural steel base or leveling plates and elevator sill angles.

21. Include all weather, frost protection, and water pumping as required. This Contractor is also responsible for the premiums required for hot water, heated aggregate and admixtures for cold weather concrete.

22. Coordinate the "Notch" in the concrete slabs to allow for a future Contractor to easily install expansion joint details.

23. Provide concrete fill at steel pan stair treads, landings and associated items.

24. Provide dewatering as required to perform your work.

25. Provide and maintain perimeter fall protection at excavated area per OSHA standards.

26. Provide certified anchor bolt verification drawings to the Construction Manager for review prior to steel erection.

27. Equipment bases and foundations shall be the responsibility of the Contractor providing the equipment.

28. Asphalt concrete paving and portland cement concrete paving, sidewalks and curbs shall be provided by others.

29. All concrete testing will be completed by the Construction Manager, however, it will be the responsibility of this Contractor to furnish all samples.

30. Provide off site disposal of all unsuitable excavated materials.

31. Provide specified sloping for floor drains/trenches in kitchen, showers, as detailed (Drains to be furnished by Mechanical Contractor.)

32. This Contractor shall include the finishing of concrete slabs around a minimum of seventy-five (75) floor penetrations throughout the first and second floor slab areas. These penetrations will consist of electrical boxes, stubbed conduits, mechanical piping and electrical and technology conduit stubs, etc.

33. This Contractor shall also include all work included in finishing the concrete floors to a minimum of 30 floor drains and or trench drains. Include all sloping and beveling to create a positive flow to the drains.

34. This Contractor shall provide written documentation that all concrete slabs are within the tolerance required by the contract documents. Testing and analysis to be paid for by this Contractor.

35. This Contractor shall include a minimum of two additional out of sequence remobilizations for concrete slab installation.

36. Provide slabs on grade, slabs on deck and welded wire reinforcement.

37. This Contractor is responsible for excavating all elevator pits, stairs and ramps as shown on drawings. This Contractor is also responsible for the backfill of these areas with suitable fill in the base bid.

38. Maintain access for Elevator Contractor's drilling rig.

39. All costs for barricades, arrows, pedestrian protections, flag men, etc. will be part of this Contract.

40. Provide foundation waterproofing.

41. The work associated with this contract will need to coordinate closely with the demolition contractor as well as the MEP contractors to establish a schedule for replacing concrete floors

after the underground work is completed.

42. This contract requires multiple crews to accommodate the interior concrete reconstruction as well as the new construction.

43. This contractor will be responsible for proving the necessary subgrade to allow for the new concrete slab. Imported materials required to adjust the existing grades shall be part of this contract; the materials used for slab fill shall be #57 stone or an acceptable equal stone based product.

44. This contractor shall be responsible for the elevator pit complete; including waterproofing and installation of imbeds.

45. This contractor shall be responsible for all dewatering associated with their work. Well pointing may be necessary to control water during excavation and installation of foundation and slabs.

46. This contractor shall be responsible for infill of all floor areas, tranches and openings created by the demolition contractor and MEP trades.

47. This contractor shall be responsible for all concrete decks at the floor levels and roof areas. Lightweight concrete shall be installed where indicated on contract documents.

48. This contractor shall include multiple mobilizations to coordinate concrete floor pours. Allow a minimum of 10 separate concrete pours for Phase I slab areas.

49. All concrete shall be placed with the use of concrete pumps and the costs shall be part of our base bid proposal.

50. This contractor shall be responsible for providing and maintain the concrete wash out areas and or the concrete dumpsters. This cost shall be part of your base bid.

51. This contractor shall be responsible for providing additional mechanical ventilation of the work area when concrete pours are taking place and curing.

52. This contractor shall include any and all concrete pads as indicated on the structural documents; housekeeping pads indicated on architectural and MEP drawings will be provided by the contractor providing the equipment.

53. This contractor shall include an allowance of $100,000 to be used at the discretion of the Construction Manager.

CONTRACT NO. HHS-32 – MASONRY AND MASONRY RESTORATION

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
Division 2	Existing Conditions
Division 4	Masonry
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 04 0125	Masonry Cleaning
Section 04 0126	Masonry Restoration
Section 04 2000	Unit Masonry
Section 07 1800	Cold Fluid-Applied Waterproofing
Section 07 2640	Spray Polyurethane Foam Insulating Air Barrier
Section 07 9200	Joint Sealants

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide masonry units, reinforcing, accessories and related work.

2. This contract includes spray foam insulation barrier work.

3. Provide all masonry restoration.

4. Caulking of masonry to masonry and to dissimilar materials.

5. Provide all stone and cast stone masonry and repair.

6. Provide DNREC approval rinsing station and maintenance for duration of this contract's work.

7. Provide and install sheet metal flashing for your work.

8. This contractor shall include removal of existing treads and risers at stairs and furnish and install new blue stone tread and riser. All subbase preparation and caulking to be included.

9. Furnish and install exterior treads and landing of blue stone. Include all stainless steel accessories.

10. Integral masonry flashings, expansion joints, insulation and other related items as

required.

11. Mock up as required: including samples of masonry repair and cleaning for Owner approval.

12. Grouting of door frames at masonry openings.

13. Weather protection and temporary heat as required to perform the work and maintain the project schedule. Include winterization as needed.

14. Scaffolding as required to complete the work.

15. Dewatering of work areas.

16. Layout of the work including responsibility for all elevations and dimensions as they affect other Contractor's work.

17. Lintels either required by this Contract or install loose lintels furnished by others.

18. Fill at hollow concrete masonry units.

19. Setting of reinforcing steel in block walls.

20. Cementitious parging.

21. Silicone waterproofing.

22. Cast stone/limestone work.

23. Temporary protection of stone work after installation.

24. Temporary protection for final wash down/cleaning of masonry.

25. All flashing as required by contract documents.

26. Thru wall and cavity flashing below the roof line shall be by the Masonry Contractor.

27. Thru wall and cavity flashing above the roof line shall be by the Roofing Contractor.

28. Cutting, fitting and building into masonry work, embedments provided by others.

29. Provide all firesafing and fire caulking as required. Work related to masonry work.

30. Furnish masonry veneer anchors to Exterior Structural Stud Contractor for installation.

31. Bond beams including reinforcing and fill.

32. At elevator entrance, tooth outside walls and add additional temporary lintel above elevator door frame.

33. Furnish and install all masonry veneer anchors where required.

34. This Contractor shall be responsible for all disposal of masonry debris.

35. This Contractor to include in their bid 500 CO-OP hours to be coordinated with the District's program. The wages paid to the CO_OP students would be funded by the NCC Vocational School District through their program sources. The contractor would be responsible to coordinate and provide on the job training for the Vo-Tech students.

36. Provide an allowance of $50,000 for additional slate and stone work as directed by Owner and Project Manager.

37. Provide an allowance of $100,000 for patching and repair of holes related to removal of fixtures, fasteners and supports, etc.

38. Provide an allowance of $75,000 for additional work as directed by Owner and Construction Manager.

39. This Contractor to include cleaning of all exterior masonry – 100% of all exterior masonry.

CONTRACT NO. HHS-33 - MISCELLANEOUS STEEL

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
Division 2	Existing Conditions
Division 5	Structural Steel and Miscellaneous Metals
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 05 5000	Metal Fabrications
Section 05 5213	Pipe and Tube Railings
Section 05 7500	Decorative Formed Metal
Section 08 9100	Louvers

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide structural steel, joists and metal floor and roof decking.

2. Furnish anchor bolts and leveling plates to the Concrete Contractor for placement in concrete piers.

3. This Contractor shall include a $10,000 allowance for the maintenance portion of the perimeter cables. All other items remain the responsibility of the Steel Contractor. The allowance will be allocated by the Construction Manager on a time and material basis. All remaining allowance shall be returned to the Owner at completion.

4. Field check all anchor bolts prior to beginning erection.

5. Roof sump pans and related work.

6. Framing out for openings (roof drains, mechanical openings, access hatches, skylight, stairs, etc.). Assume opening frames will be field installed. This contract to cut or repair all metal decking.

7. Prime paint systems, galvanizing, and related finishing of steel items, including touch up.

8. Masonry or precast anchors welded to steel columns and beams.

9. Supply and install shear studs.

10. Furnish and install pipe metal gate at second floor exterior elevation.

11. Furnish, install, maintain and remove perimeter safety steel cables and supports at all floor levels to conform with all OHSA standards for all trades.

12. The Steel Contractor will own all connections to masonry whether they are field welds or shop welds. Conditions that require in field welding and assembly are the responsibility of this Contractor. Field coordination with the masonry installer will be this Contractor's responsibility.

13. All steel testing will be the responsibility of the Construction Manager, however, this Contractor will cooperate with the testing agency in the inspection at the fabrication shop and in the field.

14. Layout, installation and alignment of attachments at the slab edge condition.

15. No electrical power for welders will be provided.

16. Provide data and submittal information related to the Scope of this Contract signed and sealed by a Professional Engineer as required by the Contract Documents.

17. This Contractor shall fabricate, weld and install all reinforcing anchors that connect the structural steel to the masonry systems. Provide all shop fabrication, a field installation and field welding regardless of the weld symbols.

18. This Contractor shall include all necessary staging, rigging, matting and remobilizations to accommodate this erection sequence.

19. Provide stairs, loose lintels, handrails, railings, steel ladders and accessories.

20. Furnish loose steel lintels, angles, plates and embedded items to the Concrete and Masonry contractors.

21. Miscellaneous rough hardware, iron shapes, framing and support angles.

22. Pipe bollards.

23. Stair nosings.

24. Gratings.

25. Roof screens, supports and grillage.

26. Louvers and grilles.

27. Overhead door frames.

28. Elevator hoist beams.

29. Elevator sill angles.

30. Toilet partition supports.

31. Dock bumpers and loading dock equipment.

32. Ships ladder.

33. Galvanizing, as required.

34. Anchoring devices, fasteners, inserts and other related items associated with the installation of the above items.

35. Verify field dimensions and field measure prior to order materials.

36. This Contractor to include in their bid 500 CO-OP hours to be coordinated with the District's program. The wages paid to the CO_OP students would be funded by the NCC Vocational School District through their program sources. The contractor would be responsible to coordinate and provide on the job training for the Vo-Tech students.

37. This contract will include all work necessary to refurbish, replace and reinstall all steel handrails as indicated on the contract documents.

38. This contractor shall include a $50,000 allowance for work to be directed by the owner and Construction manager.

39. See section 05 5213 and 05 7500 for additional allowances to be included in your Base Bid.

CONTRACT NO. HHS - 34 – CARPENTRY/ROUGH AND FINISH

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 06 1000	Rough Carpentry
Section 06 2000	Finish Carpentry
Section 06 4100	Architectural Wood Casework
Section 07 9200	Joint Sealants
Section 08 1113	Hollow Metal Doors and Frames
Section 08 1423	Clad Commercial Door
Section 08 1433	Stile and Rail Wood Doors
Section 08 3100	Access Doors and Panels
Section 08 5200	Aluminum Clad Wood Windows
Section 08 7100	Door Hardware
Section 08 7101	Hardware Sets
Section 10 1101	Visual Display Boards
Section 10 2113.19	Plastic Toilet Compartments
Section 10 2226	Vertical Folding Partitions
Section 10 2800	Toilet Accessories
Section 10 4400	Fire Protection Specialties
Section 10 5100	Lockers
Section 11 5213	Projection Screens
Section 11 6133	Stage Rigging And Draperies
Section 11 6623	Gymnasium Equipment

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide labor and materials to perform the work related to all carpentry and general work.

2. All rough carpentry related to the exterior skin of the building including wood nailers and blocking, exterior sheathing, and MEP roof curb blocking.

3. All rough carpentry related to the interior of the building including blocking, wood nailers, etc. for the installation of fire extinguishers, doors, windows, toilet accessories, cabinets, toilet partitions, casework, millwork, etc. including fire treating, as required.

4. All field trimming required to adjust to existing conditions.

5. Furnish and install all trims, rails, crown moldings, sills and aprons.

6. Furnish and install chalk and tack boards.

7. Furnish and install projection screens.

8. Furnish and install signage.

9. Furnish and install lockers. Including restoration as required.

10. Furnish and install toilet partitions.

11. Furnish and install fire extinguishers, cabinets and accessories.

12. Furnish and install operable partitions and panel walls.

13. Furnish and install toilet and bath accessories.

14. Provide all canopies related to window pockets, blocking and wood trims.

15. Recessed entrance mats and frames.

16. Coordinate cutting holes in casework with other trades.

17. Wall and corner guards.

18. Display and trophy cases.

19. Anchoring devices, fasteners, inserts and other related items associated with the installation of the above items.

20. Provide safety protection for stair and elevator opening.

21. This Contractor shall include in the base bid three hundred fifty (350) hours of Journeyman carpenter time and five hundred (500) hours of common labor time for work to be directed by the Construction Manager.

22. This Contractor shall at a minimum provide and maintain for the length of the project, one temporary fire extinguisher for each 3,000 sq. ft of the protected building area. Fire extinguishers shall be 10lb, Multi-Purpose (ABC) dry chemical, UL labeled, with a rating of 3a:40bc. Include maintenance for project duration.

23. This contract owns all caulking and sealants for work of this contract.

24. Install hold open closers with fire alarm interface: Power wiring by Electrical Contractor. Fire alarm ties in by Electrical Contractor.

25. Coordinate card reader requirements with hardware supplier and Electrical Contractor.

26. This contractor shall be responsible purchase, receive, unload, handle, store, account for and install all hardware, woods doors door frames, custom doors and metal doors.

27. This contractor will list the name of the subcontractor or vendor that is supplying the hardware, wood doors, metal doors and frames. (add to sub list on bid form)

28. This contractor shall include an allowance of 160 man hours of carpenter rate to remove and store historical items for Phase II.

29. This contractor shall include an allowance of 100 carpenter man hours to install temporary doors for the security of the building. Allow $10,000 for purchasing of materials required such as hardware, locks, doors etc.

30. This contractor shall be responsible for demolition and removal of the existing window openings prior to the installation of the new window systems.

31. Include in your proposal 240 laborer man hours for cleanup operations as directed by the Project Manager.

32. This contractor will buy and install all new aluminum clad windows for the Phase II work; include all blocking, trim, accessories as indicated on the contract documents for all openings.

33. Provide clad commercial door system.

34. This contractor shall be responsible to cover and maintain all openings related to the elevator for the duration of Phase II.

35. All installation of trim shall be filled, sanded, caulked and prepared for painting by this contractor.

36. This contractor shall own any and all caulking as it relates to materials installed by this contract.

37. This contractor shall include the cost of purchasing, storing and installing all custom trim materials".

38. This contractor shall include all "finish" carpentry items including but not limited to trim, wood rails, MDF, closure pieces and corner guards.

39. This Contractor to include in their bid 500 CO-OP hours to be coordinated with the District's program. The wages paid to the CO_OP students would be funded by the NCC Vocational School District through their program sources. The contractor would be responsible to coordinate and provide on the job training for the Vo-Tech students.

40. This contractor shall include a $50,000 allowance to provide and maintain temporary window and door openings in Phase II.

41. This contractor shall include an allowance of $30,000 to provide, install and maintain floor protection as directed by the Construction Manager.

42. This contractor shall include an allowance of $75,000 for work to be directed by the construction manager.

43. Include an allowance of $50,000 for additional doors and hardware yet to be specified.

44. Include an allowance of $75,000 for structure work related to the vertical partition.

45. Include $50,000 for additional work to be determined at locker areas.

CONTRACT NO. HHS - 35 – METAL FRAMING, DRYWALL, PLASTER

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
Division 2	Existing Conditions
Section 01 3700	BIM Coordination
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 08 3100	Access Doors and Panels
Section 09 2116	Gypsum Board Assemblies
Section 09 2236.23	Metal Lath
Section 09 2300	Gypsum Plastering
Section 09 2613	Gypsum Veneer Plastering

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide metal studs, insulation, gypsum wallboard, taping, spackling, plaster and stucco.

2. This contract include BIM coordination drawings as detailed in Section 013700.

3. Provide all metal stud framing required to back up other materials.

4. Batt insulation, both thermal and acoustical and related work.

5. Plaster systems.

6. Plaster and stucco.

7. Include molded shapes and special shapes.

8. Acoustical sealant of penetrations in drywall partitions and plaster partitions.

9. Provide all fireproofing where noted.

10. Furnish and install sixty (60) access panels to meet local and fire codes.

11. Include fire taping and sealing at perimeter edge and as shown on the Drawings.

12. Provide architectural expansion joint systems, including joint covers materials at concrete

slab, drywall and masonry construction (interior only).

13. Scaffolding and lifts for this work.

14. Comebacks and out-of-sequence work may be required and as such should be included.

15. Include all necessary field measurements.

16. Include two (2) passes per floor to "touch-up" mechanical penetrations to ensure ratings required. The first pass will be required prior to ceiling grid installation and the second pass will be required prior to final inspection for Certificate of Occupancy.

17. Bidders are advised to pay particular attention to top of wall conditions, fire and smoke safing of slabs and acoustical sealants.

18. Provide metal furring.

19. Engineered shop and installation drawings.

20. Provide an allowance of $150,000 for scaffolding at auditorium.

21. Coordination and allowing full access to other trades so they can perform their work will be included and part of this Contractor's obligation.

22. Provide an allowance for 5,000 sq ft of plaster. Include complete system with metal stubs veneer base, taped spackel and veneer plaster in multiple locations. This allowance shall be a separate line item and adjusted by unit cost.

23. This contract to include BIM requirements as identified in Section 01370 in your base bid.

24. This contractor shall include an allowance of $50,000 for work to be directed by the Construction Manager

CONTRACT NO. HHS - 36 - ACOUSTICAL CEILINGS AND PANELS

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
Division 2	Existing Conditions
Section 01 3700	BIM Coordination
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 09 5100	Suspended Acoustical Ceilings
Section 09 8400	Acoustic Room Components

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide acoustical panel ceilings, suspension system and hangers.

2. Acoustical lay in insulation blankets above ceiling where required by Specifications or Drawings.

3. This contract include BIM coordination drawings as detailed in Section 013700.

4. Supplemental suspension hangers at large ducts above ceilings and at openings for lighting fixtures.

5. Continuous acoustical sealant on back of vertical leg before installing moldings.

6. Furnish and install hold down clips where required by governing regulations for fire resistant ratings

7. Expansion joints related to acoustical ceilings.

8. Reflected ceiling layout. Include field survey and identification of existing conditions.

9. This Contractor shall cut openings in ceilings for sprinkler heads, lights, mechanical diffusers and grilles, etc.

10. Attic stock.

11. Provide acoustical wall treatment and acoustical room components.

12. This contractor shall include multiple mobilizations to the site; to accommodate coordination with the MEP trades during construction.

13. Attachment to existing structure may require some minor demolition work in certain areas; this should be included in your base bid proposal.

14. All cut edges shall be finished per manufacturer's recommendations.

15. This contractor to review to existing mock up for minimum level of quality.

16. This contractor shall allow for 2 additional passes through the building before final turnover to replace damage tiles. Include an allowance for material of $20,000 for materials to complete this work.

17. This contract to include BIM requirements as identified in Section 01370 in your base bid.

18. This contractor shall include a $75,000 allowance in their proposal for work to be directed by the construction Manager.

CONTRACT NO. HHS -37 – TERRAZZO FLOORING

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 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 09 6623	Resinous Matrix Terrazzo Flooring

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide terrazzo flooring and patching in accordance with the finish schedule and specifications.

2. Provide all cement terrazzo flooring.

3. Provide all resinous terrazzo flooring.

4. Barricades, protection and touch up as required.

5. Cleaning and protection.

6. Shop drawings and control joint drawings.

7. Provide cutting and fitting around work of others.

8. This contractor to include floor leveling and patching for all areas that are to receive Terrazzo flooring including mesh crack refining membrane.

9. This contractor will be responsible for removing the existing stone stair treads and, preparing the setting bed, purchasing new stair treads and installing.

10. Include an allowance of $75,000 for work to be directed by the Construction Manager and Owner.

11. Include an additional allowance of $25,000 for potential floor preparation.

12. Provide an allowance for 100 sq ft of epoxy terrazzo detail work. Allowance shall be a separate line item adjusted by unit cost.

CONTRACT NO. HHS -38 – FLOORING

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 09 0561	Common Work Results For Flooring Preparation
Section 09 6229	Cork Flooring
Section 09 6500	Resilient Flooring
Section 09 6800	Carpeting

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide flooring in accordance with the finish schedule and specifications.

2. Prepare subfloor for finished flooring including leveling and patching. Base bid shall include all flashing patching and surface preparation required to perform the work of this Contractor. Include "shot blasting" of all existing floor areas prior to floor preparation.

3. Resilient flooring.

4. Provide all seam-molding as required by manufacturer's recommendations.

5. Carpeting.

6. Resilient base.

7. Cork flooring and finish.

8. Resilient transition and reducer strips at edges of resilient flooring and at edges of carpeting.

9. Cleaning and protection.

10. Seaming diagrams.

11. Sheet vinyl.
12. Attic stock.

13. Provide entrance mat. Furnish entrance mat frame to be installed by Carpentry Contractor.

14. This contractor to review to existing mock up for minimum level of quality.

15. Provide two coat wax system prior to substantial completion, if required.

16. Provide finish floor material in elevator cab.

17. Provide cutting and fitting around work of others.

18. This contractor shall include "shot blasting" of all concrete subfloors prior to installation of floor patching and leveling.

19. This contractor shall include an allowance of $40,000 for floor leveling and patching.

20. This contractor shall include an allowance of $75,000 for work to be directed by the owner and construction manager.

CONTRACT NO. HHS - 39 – LAMINATE CASEWORK AND MILLWORK

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 06 1000	Rough Carpentry
Section 06 4100	Architectural Wood Casework
Section 12 3400	Laminate Clad Casework
Section 12 3600	Countertops
Section 12 3553.19	Wood Laboratory Casework

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Furnish and install all laminate casework, custom casework, refurbished casework and millwork.

2. Coordinate all work with other trades.

3. Provide all laboratory casework.

4. Provide all countertops.

5. Coordinate with plumbing and electrical submittal for cut outs in counter tops and casework.

6. Provide all caulking and sealants for all work provided by this contract.

7. Note: this contractor will be manufacturing and relocating existing millwork for this project.

8. This contractor shall include an allowance of $50,000 for work to be directed by the Owner and Construction Manager.

CONTRACT NO. HHS -40 – ROOFING, SHEET METAL AND WATERPROOFING

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 07 1300	Sheet Waterproofing
Section 07 5300	Elastomeric Membrane Roofing
Section 07 6200	Sheet Metal Flashing and Trim
Section 07 7200	Roof Accessories
Section 07 9200	Joint Sealants
Section 08 6300	Metal-Framed Skylights
Section 07 2100	Thermal Insulation

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide single ply flexible roofing system, including rigid and tapered insulation and all related accessories.

2. This contract to provide metal framed skylight.

3. This contractor to provide demolition and removal of existing roof.

4. This contractor shall carefully review the edge of roof details to determine if the roof can be placed before the exterior wall assembly is complete. This contractor shall include <u>all</u> costs associated with returning to the jobsite to complete the roof perimeter after wall assembly is complete.

5. Foundation dampproofing and waterproofing.

6. Caulking related to roofing, flashing and roof accessories.

7. Roof drains and associated plumbing shall be provided by the Mechanical Contractor. Flashing of the roof drains shall be by the Roofing Contractor. Openings for the roof drains in the roofing materials shall be cut by the Roofing Contractor. Openings in the metal deck shall be cut by others.

8. Metal parapet coping.

9. Roof hatches.

10. Walk pads.

11. Perform cutting, patching and maintenance of temporary patch for work performed by others on existing roofs intended to be re-roofed as part of this work.

12. Metal drip edges.

13. Gravel stops.

14. Roof curbs.

15. Smoke vents.

16. Provide expansion joints that are integral to the roof.

17. Provide permanent patching of existing roofing systems at areas of demolition. Demolition of roof drains, mechanical and electrical equipment shall be performed by others. All patching shall conform to original warranty requirements and documents.

18. Gutters, downspouts and splash pans.

19. Metal scuppers and related work.

20. Wood blocking shall be provided by others.

21. Coordinate all roofing with MEP trades.

22. Flashing and sheet metal.

21. Flashing Summary:

    a. Thru wall and cavity flashing below the roof line shall be by the Masonry Contractor.
    b. Thru wall and cavity flashing above the roof line shall be by the Roofing Contractor.

23. This contractor shall coordinate the removal of the old and installation of the new roofing system with the MEP trades and the carpentry contractor.

24. This contractor is responsible for all demolition of the existing roofing systems, trims, gutters, cant strips, concrete cants and flashing.

25. All debris removal shall be the responsibility of this contractor.

26. Include in our proposal 150 roofer man hours to assist perform temporary weather protection to be directed by the Construction Manager.

27. Include an allowance of $50,000 for work as directed by the construction Manager.

CONTRACT NO. HHS -41 – CERAMIC TILE

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 09 3000	Tiling

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide ceramic tile, marble tile and thresholds.
2. Quarry tile.
3. Porcelain pavers, etc.
4. Setting beds.
5. Grout.
6. Cutting and fitting around work installed by others.
7. Precast mop receptors.
8. Patching and leveling.
9. Provide protection of finished products until acceptance by Construction Manager.
10. Attic stock.
11. Provide crack suppression membrane for thin set tile installation.
12. Provide cementious backer units as part of the tile installation.
13. Provide metal strips installed as part of the tile installation.
14. Include all floor and wall preparations of existing conditions.

15. Furnish and install all required special shapes.

16. Provide an allowance of $75,000 for additional tile work as directed by the Owner and Construction Manager.

CONTRACT NO. HHS-42 – PAINTING AND COATINGS

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 09 9000	Paintings and Coating

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide all painting and vinyl or fabric wall covering (all walls and ceilings indicated on the finish schedule).

2. Scrape and remove all loose and flaking paint prior to coating existing surfaces.

3. Sealing all interior joints between dissimilar materials that require sealants.

4. Paint all exposed block work and concrete work.

5. Prime, stain or seal all wood trim and doors.

6. Paint exposed piping and ductwork (sprinkler, plumbing, electrical) in accordance with the Drawings and Specifications.

7. All exposed structural including steel to be painted.

8. Provide supplementary ventilation as required in enclosed spaces.

9. Paint and caulk all hollow metal frames and doors as shown on the door schedule.

10. Paint metal stairs and railings.

11. Prefinished items <u>will</u> <u>not</u> be painted by this Contractor.

12. Paint all semi-exposed wood blocking as indicated on the drawing.

13. Protection of adjacent surfaces.

14. Minor patching prior to application of finishes.

15. Clean up.

16. Seal all tops, bottoms and cut edges of all wood doors.

17. This Contractor to allow two hundred fifty (250) man hours and all required paint materials for these man hours to be used as directed by the Construction Manager.
18. Attic stock.

19. Final coat of paint is to be installed after ceilings are installed, if directed by Construction Manager.

20. This contractor shall include preparation and painting of the existing locker faces; the interior do not get painted. Refer to hallway mock up for level of quality.

21. This contractor shall be include caulking and preparation of all painted materials prior to painting.

22. This contractor shall include painting of all exposed ceiling areas.

23. Furnish and install all intermescent coating as required by contract documents.

24. Provide foamed in place insulation.

25. This contractor shall include 2 additional passes on each floor after the final coat has been applied to touch up walls and door frames. Include an allowance of $10,000 for materials to complete this work.

26. This contractor shall provide an allowance of $20,000 to utilize electro static painting on lockers in lieu of hand painting.

27. This contractor shall include an allowance of $60,000 for work to be determined by the construction Manager

28. This Contractor to include an additional cost of "Primer" to all wall and ceiling areas to allow for patching inspection.

CONTRACT NO. HHS-43 – WINDOW TREATMENTS

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 12 2413	Window Treatment – Roller Shades
Section 12 2424	Electronic Roller Shade System

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Furnish and install roller shade system complete. This contractor owns all accessories, fasteners, etc.

2. Coordinate all power and wiring with Electrical Contractor.

3. Provide attic stock.

4. Provide final cleaning and touch up prior to Owner occupancy.

5. This contractor required to coordinate with the finish trades for window treatment installation.

6. This contractor to include an allowance of $20,000 for additional work to be directed by the Construction Manager.

CONTRACT NO. HHS –44 STAGE LIGHTING SYSTEM

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 26 5531	Stage Lighting System

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide complete all stage lighting systems as detailed in specification section 26 5531.

2. Contractor shall include all electric work required for this contract.

3. As-built drawings s are to be provided both in hard copy and digital at completion so project.

4. This contract owns clean up and associated with their work on a daily basis.

5. Include in your base bid an allowance of $50,000 for additional work to be identified by the Construction Manager.

CONTRACT NO. HHS –45 WOOD FLOORING SYSTEMS

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
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 09 6429	Wood Strip Flooring

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide flooring in accordance with the finish schedule and specifications.

2. Prepare subfloor for finished flooring including leveling and patching. Base bid shall include all flashing patching and surface preparation required to perform the work of this contractor. Include preparation of existing conditions.

3. Include all surface leveling per specifications.

4. Thresholds and transition strips to other materials.

5. Provide all sanding, epoxy and floor finish.

6. Cleaning and protection.

7. Attic stock.

8. Provide cutting and fitting around work of others.

9. Note: all demolition of wood floors to be by the asbestos abatement contractor.

10. This contractor shall include an allowance of $50,000 to provide floor leveling and subfloor as associate with the wood floor installation.

11. This contractor shall include an allowance of $50,000 for additional work to be directed by the Construction Manager.

12. Provide wood strip flooring as specified in section 096429 Wood Strip Flooring.

13. Provide a barricades and protection of work area as needed.

14. Provide floor protection after installation. Utilize RAM Board to protect all installed wood flooring.

15. Provide shop drawings, samples and control joint drawings.

16. Provide cutting and fitting around work of others.

17. Provide all transitions required between different flooring materials.

18. Transition thresholds to be provided by this contract.

END OF SECTION

SECTION 012100 - ALLOWANCES

1. RELATED DOCUMENTS

A. 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.

B. 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.

C. 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.

D. For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

E. Include in the Contract Sum all lump sum and unit cost allowances stated in the Contract Documents.

F. Designate in the construction progress schedule the delivery dates for products specified under each allowance.

G. Designate in the Schedule of Values the quantities of materials required under each unit cost allowance.

2. ALLOWANCES FOR PRODUCTS

A. The amount of each allowance includes:

1. The cost of the product or labor to the Contractor or Subcontractor, less any applicable trade discounts.

2. Delivery to the site.

3. Labor required under the allowance, only when labor in 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.

4. Applicable taxes.

5. Profit and overhead.

B. In addition to the amount of each allowance, include in the Contract Sum the Contractor's costs for:

1. Handling at the site; including unloading, uncrating and storage.

2. Protection from the elements and from damage.

3. Labor for installation and finishing, except where labor is specified to be a part of the allowance.

4. Other expenses required to complete the installation.

5. Contractor's and Subcontractor's overhead and profit.

C. Refer to Scope Information Sheets under Section 011100 - SUMMARY OF WORK for the amount of each lump sum allowance and for work specified in the specification sections.

3. ADJUSTMENT OF COSTS

A. 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.

1. 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.

B. At Contract closeout, reflect all approved changes in Contract amounts in the final statement of accounting.

4. ALLOWANCES

A. The following allowances are part of the contractor documents and shall be included in contract sum:

1. 03 3000 BSD - CAST-IN-PLACE CONCRETE - Provide an allowance for repointing 100 cubic yards of cast-in-place concrete, as described, in miscellaneous quantities and in multiple locations.
This allowance includes purchase, delivery, and installation of cast-in-place concrete as directed by the Architect.
This allowance shall be included as a separate line item and adjusted by a Unit Price.

2. 03 3511 BSD - CONCRETE FLOOR FINISHES - Provide the following allowance in addition to the work shown as Base Bid.
   Provide an allowance for 3,000 square feet of polished concrete floor finish.
   This allowance includes purchase, delivery, and installation of polished concrete floor finish in multiple locations, as directed by the Architect..
   This allowance shall be included as a separate line item and adjusted by a Unit Price.

3. 04 0125 USER - MASONRY CLEANING - Provide the following allowance in addition to the work shown as Base Bid.
   Provide an allowance for cleaning of 15,000 square feet of brick and limestone masonry on the 1927 Building.
   This allowance includes purchase, delivery, and installation of cleaning of brick and limestone masonry in multiple locations on the 1927 Building, as directed by the Architect.
   This allowance shall be included as a separate line item and adjusted by a Unit Price.

4. 04 0125 USER - MASONRY CLEANING - Provide the following allowance in addition to the work shown as Base Bid. Provide an allowance for cleaning of 10,000 square feet of brick and limestone masonry on the Annexes.
   This allowance includes purchase, delivery, and installation of cleaning of brick and limestone masonry in multiple locations on the Annexes, as directed by the Architect.
   This allowance shall be included as a separate line item and adjusted by a Unit Price.

5. 04 2000 BSD - UNIT MASONRY - In addition to the scope of work shown, provide the following as an additional allowance.
   Provide an allowance of 2000 face bricks.
   This allowance includes purchase, delivery, and installation of face brick to match existing, as directed by the Architect.
   This allowance shall be included as a separate line item and adjusted by a Unit Price.

6. 05 5213 BSD - PIPE, TUBE AND DECORATIVE RAILINGS - In addition to the scope of work shown, provide the following as an additional allowance.
   Provide an allowance of 100 linear feet of railing.
   This allowance includes purchase, delivery, and installation of railing with guard rail, pickets and handrail, in multiple locations, as directed by the Architect.
   This allowance shall be included as a separate line item and adjusted by a Unit Price

7. 05 5213 BSD - PIPE, TUBE AND DECORATIVE RAILINGS - Provide an allowance for replacement of existing railing at ramp and steps in kind at Room No. M117 - Student Commons.
   This allowance includes purchase, delivery, and installation of to replace in kind the existing railings, guard rails, pickets and handrails, at the existing ramp and steps in Room No. 117 - Student Commons.
   This allowance shall be included as a separate line item and adjusted by a Unit Price.

8. 05 7500 BSD - DECORATIVE FORMED METAL- Provide the following allowance in addition to the work shown as Base Bid.
   Provide an allowance for fifteen (15) gravity vent grilles to replace in-kind, matching existing grilles in classrooms.
   This allowance includes purchase, delivery, and installation of gravity vent grilles.
   This allowance shall be included as a separate line items and adjusted by a Unit Price.

9. 05 7500 BSD - DECORATIVE FORMED METAL- Provide the following allowance in addition to the work shown as Base Bid.
   Provide an allowance of $20,000 to fabricate and replace existing exterior crawl space ventilation grilles and frames and attic space grilles with hoods.
   This allowance includes purchase, delivery, and installation of grilles.
   This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

END OF SECTION

SECTION 012200 - UNIT PRICES

1. GENERAL PROVISIONS

   A. 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.

   B. 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.

   C. For work being constructed under separate prime contract, provisions of this Section apply to each contract being bid.

2. BASE BID

   A. The Base Bid shall consist of all work shown or specified in the Contract Documents, exclusive of any Additive Unit Prices specified herein.

   B. The Base Bid shall include all work in any Subtractive Unit Prices specified herein.

3. UNIT PRICES

   A. 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.

   B. See Section 002113, INSTRUCTIONS TO BIDDERS for related information.

   C. For description of Unit Prices requested, refer to the specification. The method of stating the Unit Prices is described in the Bid Form.

   D. Where both add and deduct unit prices are requested, there shall not be more that a 10% variation between the two.

4. APPLICATION OF UNIT PRICES

   A. Unit prices stated in the Bid Form will apply from the time the Bid is submitted until Contract completion.

5. MEASUREMENT OF QUANTITIES

   A. Quantities shall be determined by field measurement by contractor personnel and as verified by the Construction Manager.

   B. At the Contractor's option, and at his expense, measurement may be made by a

registered surveyor.

6. LIST AND DESCRIPTION OF UNIT PRICES

Contract HHS-31 Concrete:

Unit Price No. 1:	Cast-in-place concrete slab, on grade or elevated. Unit of measure: Cubic yard of cast-in-place concrete.
Unit Price No. 2:	Cast-in-place concrete with formwork. Unit of measure: Cubic yard of cast-in-place concrete.
Unit Price No. 3:	Polished concrete floor finish. Unit of measure: 1,000 square feet of polished concrete floor finish.

Contract HHS-32 Masonry and Masonry Restoration:

Unit Price No. 4:	Cleaning of brick and limestone masonry. Unit of measure: Square food of masonry surface cleaned
Unit Price No. 5	Replace brick. Unit of measure: each brink replaced. Repointing of existing brick wall per sq ft.

Contract HHS-33 Miscellaneous Steel:

Unit Price No. 6:	Provide railing with guard rail, pickets and handrail, as specified in this section. Unit of measure: Per linear foot of railing installed.
Unit Price No. 7:	Replace in kind the existing railings, guard rails, pickets and handrails at the existing ramp and steps in Room No. 117 – Student Commons. Unit of measure: Lump sum per item installed.
Unit Price No. 8:	Provide gravity vent grilles. Unit of measure: Per each gravity vent grille installed.

Contract HHS-35 Metal Framing, Drywall, Plaster:

Unit Price No. 9:	Gypsum plaster patching. Unit of measure: Sq Ft of gypsum plaster patching.
Unit Price No. 10:	Veneer plaster wall. Unit of measure: Sq Ft veneer plaster wall.

Contract HHS-37 Terrazzo Flooring:

Unit Price No. 11:	Epoxy terrazzo logo. Unit of measure: Sq Ft of epoxy terrazzo logo.
Unit Price No. 12:	Epoxy terrazzo flooring. Unit of measure: Sq Ft of epoxy terrazzo flooring.

Contract HHS-42 Painting and Coatings:

Unit Price No. 13:	3-coat painted wall. Unit of measure: Sq Ft of 3-cost painted wall.
Unit Price No. 14:	1-coat painted wall. Unit of measure: 1-coast painted wall.

Concrete HHS-45 Wood Flooring:

Unit Price No. 15:	Wood strip flooring at stage/gymnasium. Unit of measure: Sq Ft of wood strip flooring.
Unit Price No. 16:	Wood strip flooring at Room No. M019. Unit of measure: Sq Ft of wood strip flooring.

END OF SECTION

SECTION 012300 - ALTERNATES

1. GENERAL PROVISIONS

A. 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.

B. 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.

C. For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

2. BASE BID

A. The Base Bid shall consist of all work shown or specified in the Contract Documents, exclusive of any Additive Alternates specified herein.

B. The Base Bid shall include all work in any Subtractive Alternates specified herein.

3. ALTERNATES

A. State in the Bid Form the amount to be added to the Base Bid for each Alternate specified.

B. See Section 002113 - INSTRUCTIONS TO BIDDERS for related information.

C. 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.

N/A

END OF SECTION

SECTION 012600 - CHANGE ORDER PROCEDURES

1. GENERAL:

A. 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.

B. 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.

C. 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.

D. 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:

A. Specific changes initiated by the Owner, Architect, Construction Manager (CM) or Contractor will be processed as follows:

1. 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.

2. 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.

3. 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 change order request.

B. 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:

A. 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.

B. 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.

C. In all cases, this cost or credit shall be based on the "DPE" wages required and the "invoice price" of the materials/equipment needed.

D. "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 maximum multiplier of 1.35 times DPE).

1. "Fringe Benefit" is any medical, life or disability insurance, paid time off, etc.

2. "Worker's Compensation" is the insurance required for injuries including medical leave, etc.

3. "FICA" is the costs association with Social Security and Medicare insurance.

4. "Unemployment insurance" is the cost associated with the governmental assessment for employee's unemployment benefits.

E. "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.

F. 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.

G. 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 submit the information as follows:

1. 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".

2. 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.

3. 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".

4. 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.

5. 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.

6. Once approved on Building Blok, the Contractor is to print out a copy of the approved change order request form and send a signed hard copy of the request with a printout of the associated back-up to the Construction Manager.

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

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: Howard High School
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: Renovations to Howard High School of Technology

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	

3/2012

NCC Vo-Tech School District
Howard High School
Bid Package 'D'

February6, 2017

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 012613 - CONTRACTOR COMPENSATION

1. GENERAL

A. 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.

1. 15% mark-up (10% overhead and 5% profit) by the Contractor on Work performed by his own forces.

2. 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.

3. Contractor mark-up shall include supervision, home and field overhead, all self-owned small tools and equipment.

B. 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 012900 - PAYMENT PROCEDURES

1. GENERAL PROVISIONS

A. 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.

B. 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.

C. For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

2. REQUIREMENTS INCLUDED

A. Submit Applications for Payment to Construction Manager in accordance with the schedule and procedures established in the Contract Documents.

3. RELATED REQUIREMENTS

A. Owner-Contractor Agreement.

B. Conditions of the Contract: Article 9 PAYMENTS AND COMPLETION.

C. Section 01 31 13: Project Coordination Meetings

D. Section 01 33 00: Submittal Procedures

E. Section 01 77 00: Closeout Procedures

4. FORMAT AND DATA REQUIRED

A. Submit itemized applications inputted into Building Blok (EDiS' Web-Based Project Management software), examples of which will be furnished to the Contractor at the Pre-Construction meeting.

B. 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.

C. Once approved on Building Blok, print out two copies and submit signed and notarized copies to the Construction Manager.

5. PREPARATION OF APPLICATIONS FOR PROGRESS PAYMENTS

A. Form: AIA Document G702/CMa

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in summary of dollar values to agree with respective totals indicated on Continuation Sheets.

B. Continuation Sheets:

1. Line items of components of Work will be subject to Owner's review and approval under the Provisions of Section 013300 - SUBMITTALS, and the General Conditions. Continuation Sheets shall follow Schedule of Values submitted with the first application for payment.

2. Fill in total list of all scheduled components of Work, with item number and scheduled dollar value for each item. Fill in values of work completed in the period.

3. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored; round off values to nearest dollar.

4. List each Change Order executed prior to date of submission, at the end of the Continuation Sheets; list by Change Order Number, and description, as for an original component item of work.

5. Contractor is to include a line item for "Closeout Documents" equaling 3.5% of their contract value.

6. PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified in progress payments.

7. SUBMITTAL PROCEDURES

A. Complete Payment Applications:

1. Submit completed Application to the Construction Manager by the date stipulated in the Project Manual.

B. Number: Submit 2 copies of each Building Blok invoice signed and notarized payment application.

END OF SECTION

SECTION 013113 - PROJECT COORDINATION MEETING

1. PROJECT COORDINATION MEETING

   A. An on-site project coordination meeting will be held on a biweekly basis throughout the project construction period.

2. ATTENDANCE

   A. Attendance at the project coordination meeting is mandatory of each Contractor or major supplier on the project.

   B. The representative of the Contractor shall be the Project Manager and field superintendent, unless a substitute representative has been approved by the Construction Manager.

   C. 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

   A. The Construction Manager will set the agenda for the biweekly Project Coordination Meeting.
   B. 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 013119 – PRE-INSTALLATION MEETINGS

1. PRE-INSTALLATION MEETINGS

   A. An on-site pre-installation meeting will be held at least two weeks prior to commencement of installation of work.

2. ATTENDANCE

   A. Attendance at the pre-installation meeting is mandatory of each Contractor and/or major supplier as required for each specific meeting listed below.

   B. 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

   A. 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
   - Foundations & Concrete Slabs
   - Underslab Utilities
   - Structural Steel Erection & Miscellaneous Metals OSHA mandated Safety Meeting
   - Roofing OSHA mandated Safety Meeting
   - Masonry
   - Windows, Storefront, & Glazing
   - Doors/Frames/Hardware
   - Casework & Millwork
   - Acoustical Ceilings
   - Paint and VWC
   - Flooring (VCT, Carpet)
   - Epoxy Flooring
   - Food Service Equipment

- Partition Walls
  - Metal Studs
  - Drywall
  - Insulation
  - Doors/Frames/Hardware
- Fire Protection
  - Fire Sprinkler Systems
  - Fire Alarm Systems
- MEP Coordination
  - Mechanical Piping Roughin
  - Plumbing Roughin
  - Insulation
  - Electrical Roughin
  - Electrical – Bonding, grounding, lightning protection
  - Automatic Temperature Controls
  - Commissioning

5. AGENDA

A. At a minimum, the Contractor shall be prepared to discuss the items as listed on the agenda template shown on the following page:

PROJECT: RENOVATIONS HOWARD HIGH SCHOOL OF TECHNOLOGY
PRE-INSTALLATION MEETING: (Phase of Work)

A. ATTENDEES:

NAME	COMPANY	WORK ITEM	CONTRACT

B. TESTING & INSPECTION REQUIREMENTS

C. REVIEW CONTRACT DRAWINGS AND SPECIFICATIONS

Drawing / Spec No.	Comments / Conflicts

D. REVIEW SCOPES OF WORK

E. REVIEW RELEVANT RFI'S

F. REVIEW SUBMITTALS

G. REVIEW MATERIALS AND DELIVERIES

H. REVIEW SCHEDULE AND SEQUENCE OF WORK

I. JOB SITE SAFETY

- 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

J. COORDINATION WITH OTHER TRADES

K. ACTION ITEMS AND RESPONSIBILITY

L. CLOSEOUT

END OF SECTION

SECTION 013125– WEB-BASED PROJECT MANAGEMENT SYSTEM

1. GENERAL PROVISIONS

A. 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.

B. Refer to provisions in AIA Document A232 – 2009 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, for requirements in addition to those specified in Division 1.

C. 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.

D. All Contractors shall use Internet/Web-based project management software to transmit documents, track, and otherwise manage this project.

E. Use of this project management software will not change any contractual responsibilities of the construction team members.

2. DEFINITIONS

A. 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.

B. 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.

C. 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.

D. 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

A. 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.

B. The use of the system will be mandatory by the Contractors to send, retrieve, and respond to data.

C. 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

A. 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.

B. Technical assistance will be provided by on-line help, email, or telephone for all Users through-out the life of the project.

5. SUBMITTALS

A. Submit to the Construction Manager, within 5 days following the receipt of the letter of intent to award, in an electronic template, the following:

1. Electronic logo of organization (as needed)
2. Names, mailing address and electronic address of its Users and Contacts.
3. Designation the role/responsibility for each User

6. SOFTWARE AND HARDWARE REQUIREMENTS

A. 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.

B. 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

A. 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 electronic platform allows information to be transmitted across the internet reducing printing and postage costs and the time associated with such activities.

B. The system contains a directory of the project participants.

C. 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.

D. The system allows the templates (and attached documents created outside the system) to be distributed to Users and Contacts.

E. 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.

F. 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.

G. The system is the product of ***Building Blok LLC*** (www.buildingblok.com) and will be continuously updated.

H. The Construction Manager will administer the Building Blok User accounts for this project.

8. DOCUMENTS CREATED INSIDE THE SYSTEM

A. The following documents shall be created on templates inside the system.

1. Transmittals for submittals processed in the system. The transmittals are automatically created by the system when the submittal is uploaded.
2. Submittal Register showing all of the submittals required of the contract, assigned to each Contractor.
3. Submittal Log: The CM will maintain submittal log after it is initialized.
4. RFI (Requests for Information)
5. Change Orders
6. RFP (Requests for Proposal)
7. ASI (Architect's Supplemental Instructions)
8. Tasks & Memos as determined by the CM

9. Payment Applications
10. Closeout Tracking Log

B. The following documents may, at each Users option, be created on the system.

1. Morning & Afternoon Activity Reports generated by the system
2. E-mails: Contacts that do not have access to the system may be sent information from the system, by the system.
3. Reports of information on the system
4. Project Notices: "Broadcast" messages can be sent to other Users system entry screen.

9. DOCUMENTS CREATED OUTSIDE THE SYSTEM AND DISTRIBUTED BY THE SYSTEM

A. 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.

1. 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.
2. Photographs: Digital photographs and scanned images can be loaded onto the system and shared.
3. Schedule of Values/ Payment Applications: (The "pencil" review of these documents can occur inside the system).
4. Change Orders: (The "pencil" review of these documents can occur inside the system.)
5. Schedules: The schedule document(s) will be available for review on the system.
6. Data created in other software may be uploaded to the system electronically.

10. DOCUMENTS CREATED OUTSIDE THE SYSTEM AND DISTRIBUTED OUTSIDE THE SYSTEM

A. 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.

1. 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.
2. 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.

3. Meeting minutes will be created using Microsoft Word 2003 and distributed through hard copies at meetings or through email.
4. AIA closeout documents, which require an "original" signature, will created and distributed outside the system.

END OF SECTION

SECTION 013216 - CONSTRUCTION SCHEDULE

1. PRE-BID CONSTRUCTION SCHEDULE

A. 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.

B. The Pre-Bid Construction Schedule includes allowances for time lost due to adverse and abnormal weather conditions, other than floods, hurricanes, tornadoes, lightening 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.

C. Phase II work to start June 12, 2017 and be complete by July 25, 2018.

2. SCHEDULING OF THE WORK AFTER AWARD OF CONTRACT

A. 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.

B. 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.

C. The Contractor shall submit proposed schedule revisions and obtain the written approval of the Construction Manager therefore before deviating from the Project Construction Schedule.

C. 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.

3. ADHERENCE TO THE SCHEDULE

A. 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.

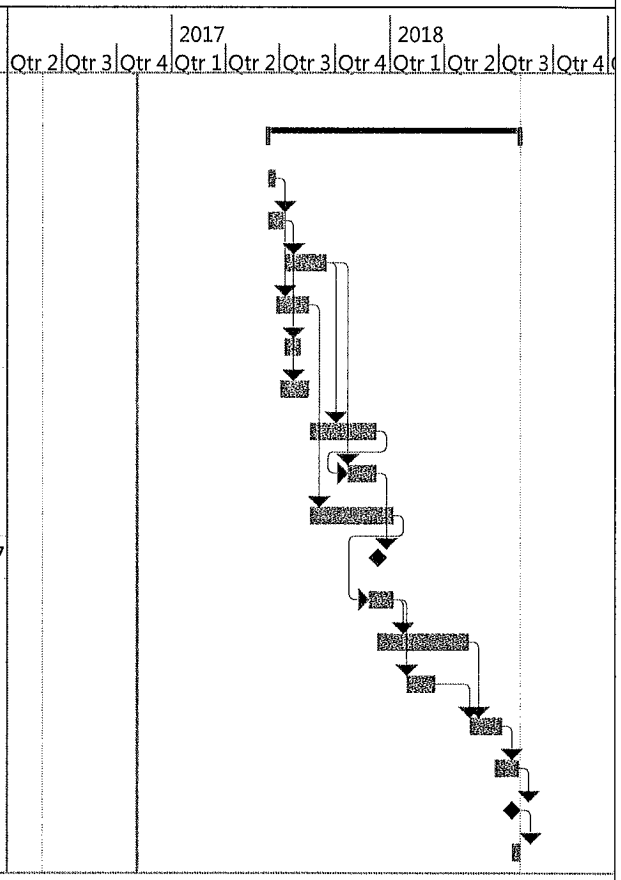
B. If the Construction Manager determines that the Contractor is behind schedule, the Construction Manager shall have the right to require that the Contractor take steps, at the Contractor's expense, to accelerate its Work. Such steps shall include increases in manpower, equipment and materials and/or 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.

C. 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

NCC Howard HS Phase II
BP-D Bid Schedule
11/5/2016

ID		Task Mode	Task Name	Duration	Start	Finish
1						
2			**PHASE II BP-D Construction Duration**	**301 days**	**Mon 6/12/17**	**Mon 8/6/18**
3			Mobilization	10 days	Mon 6/12/17	Fri 6/23/17
4			Asbestos Abatement	20 days	Mon 6/12/17	Fri 7/7/17
5			Demolition and Removal	50 days	Mon 7/10/17	Fri 9/15/17
6			Lower Level Concrete Slabs	40 days	Mon 6/26/17	Fri 8/18/17
7			MEP Rough In I	20 days	Mon 7/10/17	Fri 8/4/17
8			Temporary HVAC Rerouting	35 days	Mon 7/3/17	Fri 8/18/17
9			MEP Install I	80 days	Mon 8/21/17	Fri 12/8/17
10			Roof Demolition and Replacement	35 days	Mon 10/23/17	Fri 12/8/17
11			Building construction and Renovations	100 days	Mon 8/21/17	Fri 1/5/18
12			Building Watertight	1 day	Mon 12/11/17	Mon 12/11/17
13			MEP Rough Interior II	30 days	Mon 11/27/17	Fri 1/5/18
14			Interior Construction / Finishes	110 days	Mon 12/11/17	Fri 5/11/18
15			MEP Start Up	35 days	Mon 1/29/18	Fri 3/16/18
16			Final Finishes and Accessories	40 days	Mon 5/14/18	Fri 7/6/18
17			Punch list and Clean Up	30 days	Mon 6/25/18	Fri 8/3/18
18			Substantial Completion	1 day	Mon 7/23/18	Mon 7/23/18
19			Owner Occupy Space	10 days	Tue 7/24/18	Mon 8/6/18



Project: Howard HS Phase I Bid
Date: Sat 11/5/16

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

SECTION 013219 - SUBMITTAL REGISTER

1. SUBMITTALS/SUBMITTAL REGISTER

A. 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.

B. 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.

C. Within seven (7) days after award of Contract or issuance of Notice to Proceed, the Contractor shall execute and submit to the Construction Manager, seven (7) copies of the Submittal Register, on a form to be provided by the Construction Manager, on which shall be listed 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 Submittal Register form shall be reproduced by the Contractor. 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

A. Submit tagged or labeled samples in triplicate, unless another quantity is otherwise specified by the Construction Manager.

B. 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 - CONTRACTOR DAILY REPORTS

1. CONTRACTOR DAILY REPORTS

   A. The Contractor 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).

   B. The Contractor 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

   A. The Contractor 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.

   B. A separate Daily Extra Work Report shall be submitted for each separate authorized Extra Work item done on a time and material basis.

   C. The Contractor 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

   A. A sample daily report follows this section for your reference.

END OF SECTION

EDiS COMPANY

CONTRACTOR'S DAILY REPORT

Project Name: Renovations to Howard High School of Technology

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 013300 – SUBMITTAL PROCEDURES

1. GENERAL PROVISIONS

A. 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

A. 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.

B. Policies or Certificates of Insurance: Two (2) copies simultaneously with the signed Agreement. See General Conditions Article 11 and Supplementary Conditions.

C. Contractor's License: Submit a copy of all business licenses required by local and state agencies.

D. Contractor's Schedule of Values: Two (2) copies for approval within 21 days after the Agreement is signed. See General Conditions Article 9.2 and provisions in this Section.

E. 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.

F. Submittal Schedule: Two (2) copies for review and reference within 21 days after the Agreement is signed. See provisions in this Section.

G. Products List: Two (2) copies for approval within 30 days after the Agreement is signed. See provisions in Section 016200 - MATERIAL AND EQUIPMENT.

3. NON-RESIDENT CONTRACTOR & SUBCONTRACTORS BONDS

A. Refer to requirements in Section 011100 - INSTRUCTIONS TO BIDDERS for filing of Surety Bonds with the Division of Revenue.

B. 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.

4. RELATED REQUIREMENTS

A. See Section 017700 - CONTRACT CLOSE OUT: for submittal requirements for Contract Close out.

5. SUBMITTALS

A. All submittals shall be directed to the Construction Manager in the manner directed by the Construction Manager, and paragraph 9 of this section. Contractor shall use the Contractor Submittal Form appended to this section.

B. Prepare a Submittal's Schedule 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.

C. 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

A. Conform to provisions in General Conditions applying to Shop Drawings.

B. 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. Maximum sheet size: 30″ x 42″.

7. PRODUCT DATA

A. Conform to provisions in General Conditions applying to Product Data.

B. Preparation:

1. Clearly mark each copy to specifically identify products or models pertinent to project.

2. Show performance characteristics and capacities.

3. Show dimensions and clearances required.

4. Show wiring or piping diagrams and controls.

C. 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

A. Conform to provisions in General Conditions applying to Samples.

B. 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.

C. Field samples and mock-ups; See requirements, if any, in other specification Sections.

9. SUBMITTAL REQUIREMENTS

A. Make submittals promptly through the Construction Manager 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.

B. Number of submittals required.

1. Shop drawings: Submit eight (8) copies for each submittal. Copies will be marked up with corrections and comments, stamped and returned. Any additional copies required by the Contractor shall be made by him.

2. Product Data: Submit a clear .pdf scan of each submittal on to Building Blok. Scanned shop drawings will be marked up with corrections and comments, stamped and returned. Any additional copies required by the Subcontractor shall be made by him from the returned scan.

3. Samples: Submit three (3) each. Submit a scanned picture of the submittal on to

Building Blok with a transmittal document showing the date sent to the construction manager. When approved it will be returned to the Construction Manager to be retained at the site for reference use.

C. 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.

D. Shop Drawing coordination and interface with work of other Contracts and adjacent work is the responsibility of each individual Contractor.

E. All submittals shall be accompanied by the contractor's submittal form, a copy of which is part of this section. The contractor's submittal form must be completed in its entirety by the contractor.

10. <u>RESUBMISSION REQUIREMENTS</u>

A. Make any corrections or changes in the submittals required by the Architect and resubmit until approved.

B. 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.

C. Samples: Submit new samples as required for initial submittal.

11. FINAL DISTRIBUTION OF APPROVED SUBMITTALS

A. The Construction Manager will receive and log submittals and forward to Architect after processing.

B. The Construction Manager will distribute copies of Shop Drawings and Product Data which carry the Architect's stamp to:

1. Contractor that made submittal.

2. Jobsite File.

3. Record Document File.

4. Other Contractors, as required for coordination.

C. The Construction Manager will distribute samples as required.

D. 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

A. Input online using Building Blok version of AIA Document G703, Continuation Sheet to G702.

13. PROGRESS SCHEDULE

A. Prepare schedules in the form of a horizontal bar chart.

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.

B. Format of listings: The chronological order of the start of each item of work.

C. Show the complete sequence of construction by activity.

D. 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.

E. Show projected percentage of completion for each item as of the first day of each month.

F. Update Progress Schedule monthly and submit with Application for Payment and Schedule of values.

G. Indicate progress of each activity to date of submission.

H. 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.

I. 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.

J. Submit one reproducible transparency.

K. After review, distribute copies of the schedule to:

1. Jobsite File.

2. Subcontractors.

3. Architect.

4. Owner.

L. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

END OF SECTION

SECTION 013500 – 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 background check cannot be any older than 1 year prior to the date of the contract between the Contractor and the Owner. 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.

2. The contractor is required to provide the Construction Manager written notice verifying background checks were completed and screened by the contractor prior to an employee entering the job site. This notice will contain the individual's name and the last four digits of their social security numbers. Notices must be received no later than two (2) working days before access is required. Notices will be forwarded electronically to the Construction Manager. A sample notice follows this section for your reference.

END OF SECTION

Date

Project Manager
EDiS Company
110 South Poplar Street
Wilmington, DE 19805

RE: INSERT PROJECT NAME - Certification of Background Checks

Dear _____:

This letter is to certify that background checks have been completed in accordance with Section 013500 Contractor Employee Background Check. The following individuals are certified as having met the requirements of the specification:

Name	Last 4 SSN
Mr. John Smith	1234

If you require any additional information you may contact INSERT POINT OF CONTACT, PHONE NUMBER AND EMAIL ADDRESS.

Sincerely,

Company

NAME
TITLE

SECTION 013523 - SAFETY PROGRAM

1. GENERAL

A, The Contractor shall be responsible for initiating, maintaining and supervising all safety activities and programs in connection with the Work.

B. Contractor shall be responsible for the safety of its personnel.

C. 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), high visibility garments, and work boots.

2. SAFETY PROGRAM

A. 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.

B. 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.

C. 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.

D. 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.

E. The employer shall verify compliance by preparing a written certification record. 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.

F. Copies of any and all documents, including information stored electronically, such as safety and health program handbooks and training certification records.

1. 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.

G. Contractor Daily Reports with Safety Inspection Checklist will be submitted daily to Field Manager, verifying inspection of work area, machinery, equipment and tools.

H. 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.

I. 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 work sites. The Policy is as follows:

A. 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.

B. It is a violation for employees and Contractors' employees to report to work while influenced by illegal drugs or alcohol.

C. 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.

D. 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

A. 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.

B. 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.

C. 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.

D. 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.

E. 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.

F. 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.

G. 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.

H. 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

A. 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

A. The Contractor shall schedule weekly "tool box" safety sessions to be held by his job safety supervisor or superintendent for all of his employees.

B. 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

A. Contractors shall report all accidents or injuries on a timely basis in accordance with all applicable regulations.

B. Contractors shall promptly complete an accident investigation report of all accidents.

C. 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

A. The Construction Manager may employ the services of a Safety Representativ*e* on the project.

B. 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.

C. 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.

D. 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

A. 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.

B. 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.

C. 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

A. 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.

B. 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

A. Contractor is responsible, in accordance with federal, state, local laws and regulations including OSHA. Contractor 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.

B. 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.

C. 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.

D. 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.

E. 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.

12. AIRBORNE CONTAMINENTS PROCEDURES

A. Contractor must provide and use equipment furnished with Exhaust Purifiers / Scrubbers when any equipment produces airborne containments and will be used in an enclosed building.

B. The Contractor shall verify air quality by the use of air monitoring equipment and document such verified air quality on the daily report. The monitoring equipment shall, at a minimum, be designed with an auditory alarm and shall provide continuous

monitoring of these four gases: Oxygen, Hydrogen Sulfide, Carbon Monoxide and Combustible gases.

C. The Contractor must provide administrative or engineering controls to protect its workers from exposure to occupational health, environmental or other hazards to be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed by local, state, and federal regulations. Any equipment and technical measures used for this purpose must first be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with 1926.103.

END OF SECTION

CONTRACTOR
COMPETENT / QUALIFIED PERSON DESIGNATION LOG

Project: **Field Manager:**

Contract: Contrctor:	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				

Contract: Contrctor:	Applicable to Subcontractor (yes / no)		Foreman	Competent Person (if not foreman)
Subpart V - Power Transmission and Distribution				
1926.955 Overhead Lines				
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

PU09, Revised 3/2012

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 01370
BIM COORDINATION
Modified by Chris Donahue 5/16/2015

1. DEFINITIONS

1.1. **Base Structural Model** – the structural steel mill order drawing file showing all structural elements. This model is not necessarily fully detailed with all connections.

1.2. **Base Architectural Model** – a combination of the Base Structural Model and key architectural elements. This model is to be used by all coordination participants as the background file in which to develop their work. No information within this model will be changed through the coordination process. It is for reference only.

1.3. **Base Composite Model** – this model includes all trade drawing files within the Base Architectural Model as a representation of the completed systems. This model is used to run the intermediate clash reports and is considered a work in progress.

1.4. **Final Coordination Model** – this model shows all trades' systems fully coordinated within the Base Architectural Model. All clashes have been resolved. No further coordination is required. The work shown within this model represents the upcoming installations of each system.

1.5. **Completed Coordination Model** – this model is the close-out submittal to the Owner and includes the information within the Final Coordination Model as well as any project updates that have taken place during installations such as RFI responses, as-built conditions, etc.

1.6. **Building Information Model -** A Building Information Model(s) is a digital representation of the physical and functional characteristics of the Project and is referred to in this document as the "Model(s)," which term may be used herein to describe a Model Element, a single Model or multiple Models used in the aggregate. "Building Information Modeling" means the process and technology used to create the Model.

1.7. **Level of Development** - The Level(s) of Development (LOD) describes the level of completeness to which a Model Element is developed.

1.8. **Model Element** - A Model Element is a portion of the Building Information Model representing a component, system or assembly within a building or building site. Model Elements are represented by the Construction Specifications Institute (CSI) UniFormat™ classification system in the Model Element Table in Exhibit 1 - Article 3.

1.9. **Model Element Author** - The Model Element Author is the party responsible for developing the content of a specific Model Element to the LOD required for a particular phase of the Project. Model Element Authors are identified in the Model Element Table in Exhibit 1 - Article 3.

1.10. **Model User** - The Model User refers to any individual or entity authorized to use the Model on the Project for analysis, estimating, or scheduling.

2. COORDINATION DRAWING PROCESS – GENERAL REQUIREMENTS.

2.1. The coordination model shall be derived from the design base composite model which shall be in a (Program File Format – Ex: Revit 2014) format and utilized by all coordination participants. The A/E is to provide this base composite model as needed at each plan deliverable for coordination efforts. This model will be utilized to establish field installation sequence, resolve trade coordination issues prior to installation, and to make the most efficient use of installation space without sacrificing system performance for mechanical, electrical, structural and architectural systems. (Program File Format – Ex: NAVISWORKS or IFC) design review software will be used to document, identify and resolve interferences between all trades.

2.2. Communication is a critical element to the success of this coordination process. All project team members must be in constant communication to keep the process moving forward according to the sign-off schedule (5.1). Constant collaboration is expected of all team participants and each participant should be proactive in identifying and resolving design, engineering, and model interferences.

2.3. EDiS Company will facilitate and lead the 3D coordination modeling process. It is the responsibility of all coordination participants to resolve discrepancies pertaining to their own model. All trades shall be responsible for collisions/clashes/coordination issues involving their respective trade(s) and proposed work. Coordinated work takes precedence over field routed systems.

2.4. Coordination meetings will occur weekly starting TBD. Selected coordination team members are required to generate a clash-free model inclusive of all systems. The following participants are required to attend the weekly coordination meetings:

<u>Bid Package A</u>:

Contract HHS-05	Structural and Miscellaneous Steel
Contract HHS-07	Metal Framing, Drywall, Plaster
Contract HHS-08	Acoustical Ceilings and Panels
Contract HHS-17	Conveying Equipment

<u>Bid Package B</u>:

Contract HHS-19	Mechanical & Plumbing
Contract HHS-20	Electrical and IT Infrastructure
Contract HHS-21	Fire Protection
Contract HHS-22	Testing, Adjusting and Balancing
Contract HHS-24	ATC
Contract HHS-25	Conveying Equipment

<u>Bid Package D</u>:

Contract HHS-35	Metal Framing, Drywall, Plaster
Contract HHS-36	Acoustical Ceilings and Panels

2.5. A mandatory coordination kick-off meeting for all participants will review; team collaboration, the execution process, the coordination schedule, establishing zones per system, use of the coordinated elements during construction, project specific information and requirements, and model/document standards.

2.6. DELETE

2.7. Section 5 of this document will provide the coordination schedule per level/zone.

2.8. Coordination meetings will be held at Virtual Goto Meeting to review the model's progress per the schedule and process indicated.

2.9. Utility corridors and above ceiling space for each trade, will be established by the group at the beginning of the process. These zones will be adjusted through the coordination process to meet installation requirements and feasibility.

2.10. All participants are required to identify the submittals required for accurate detailing of the coordination model (such as equipment, light fixtures, etc.) and to obtain final approval so the information can be incorporated into the modeling process.

2.11. The 3D coordination modeling process does not replace the standard submittal process and will not be considered as a submittal. Exceptions: N/A

2.12. The coordination meeting:

2.12.1. The purpose is to review and resolve items on the current clash report in conjunction with the project coordination schedule. The meetings will focus on clashes that cannot be resolved by internal collaboration. EDiS Company will facilitate the meeting and will make final decisions on clash resolution that are the least impact to the project as a whole. COORDINATION MEETINGS WILL NOT BE USED TO RESOLVE INDIVIDUAL MODELER'S/ENGINEER'S/ARCHITECTURE'S/SUBCONTRACTOR'S WORK. If a Subcontractor does not post a clash-free system of its own work or that only contains a very limited number of clashes internally (Example: Fire Sprinkler Clashing with Fire Sprinkler), that Subcontractor will be considered unprepared for the meeting and will be responsible for any delays to the project schedule and any associated costs due to that delay which shall be determined by EDiS Company.

2.12.2. Each team participant will review the clash report prior to the subsequent coordination meeting in order to clean up any clashes that can be made without review by all participants.

2.12.3. All project participants are expected to be prepared for the meeting with new drawing work of the next area to be coordinated per the coordination schedule and any drawing changes based on the published clash report. Each participant will have available any shop model, submittals or other materials required to solve identified or potential conflicts.

2.12.4. The coordination schedule will be maintained and all identified conflicts addressed and resolved per the construction schedule. The coordination schedule may change as a result of design and/or model changes requested and made by the Owner, Architect or Engineer. In addition, the coordination schedule assumes selection of equipment is made within the time frame of the construction schedule as needed so it is incorporated into the coordination efforts without delay.

2.12.5. All agreed upon corrections to identified clashes determined by the team at the Coordination Meeting are to be updated and resolved prior to the next meeting.

2.13. When an area of the model is fully coordinated and clash-free, each participant agrees:

2.13.1. That each trades work is fully coordinated and will be installed per the signed off area as reflected in the coordination model. Sign off drawings from each trade are turned over in PDF form with projects title block. EDiS Company will include legend and title block for trade PDF file.

2.13.2. All trades to provide Total Coordination drawings at the time of sign off. TCD's are drawings which include all trades sign off models. Models are submitted for turn over to EDiS Company. The purpose for TCD's is to provide coordinated building models for jobsite coordination. Models from subcontractors to include all but not limited to: item elevations, product type and all equipment tags.

2.13.3. During the installation of each trade's work, EDiS Company will refer to the signed off report and the 3D model to resolve any conflicts. Each installation firm agrees to install all work per the signed off drawings/model, without deviation. If a deviation, during installation, takes place without prior approval from all detailing parties, it will be the responsibility of the installing contractor to tear out the work and install it as shown on the signed off drawings/coordination model. The cost of this work will be evaluated when the issues arise; however, the party responsible for the conflict will be responsible for the cost of the fix, including the additional detailing time of all parties involved.

2.13.4. The model is not considered to be the final coordination model until the BIM Coordinator, EDiS Company's Project Manager, A/E, and Owner has approved all clash free systems and routings and documents are signed off by all parties (contractors).

2.14. Should a conflict arise during installation that was missed during the coordination process, and not a result of deviating from the signed off area, the coordination team will work together to find a solution that is optimal for all trades and the project.

2.15. The final coordination model shall be kept up to date by all participants during construction to include as-built information and any other pertinent data that is essential to the project. The data will be submitted electronically in Revit, AutoCAD, NWC, PDF format. Items to be included are:

2.15.1. RFI responses.

2.15.2. Design change orders or designs that are in addition to the original contract documents.

2.15.3. Equipment will be tagged with all (Owner required) identification information within the model (ex. Equipment schedule information and O&M Manuals). This identification information will be the same and correspond to all other close-out documentation. This close-out documentation including O&M manuals, maintenance information, etc. will be included in PDF form.

2.15.4. EDiS will provide a location for the subcontractor to submit the required documentation at a later time. EDiS will generate the completed coordination model based on these documents for turn-over to the owner.

2.15.5. Tekla or Navisworks will be utilized to link PDF closeout documents, select RFI's, select Images, etc., to the closeout model. Subcontractors need to provide closeout documents in the format requested by EDiS for the closeout model as well as adding smart data to other model type files as determined necessary by EDiS within the time frame ABHA dictates. For example, if Revit files are needed to produce the closeout model, EDiS may direct subcontractor to set up certain Revit views for the exporting of files which make up the as-built models. ABHA may also request that the subcontractor create viewpoints for their equipment in as-built model.

2.16. Data for coordination will be available on the Box.com, to be referenced by the other participants. Models and drawing files will never be tampered with by non-owners of the file. If a mistake occurs

and a drawing is inadvertently modified, the responsible party is required to alert the project team. (See attachment)

2.17. The Owner's commissioning agent can attend the coordination meeting to review the detailing effort for commissioning related items.

2.18. All trades will provide Level of Development (LOD) (400) models for weekly coordination meeting.

3. REQUIREMENTS OF THE LEAD COORDINATOR

3.1. The Lead Coordinator will be EDiS Company.

3.2. Identification of a common insertion point for all drawing files. (Utilize Revit Models origin)

3.3. A/E to provide Lead Coordinator model exports to 2D/3D CAD of each trade component as needed to coordination. Origins to be maintained in exports.

3.4. Using the A/E's files, the Lead Coordinator will utilize & maintain the base architectural model.

3.4.1. The base architectural model is a combination of the base structural model and other architectural elements. These architectural elements will include all elevated 3D architectural elements including, but not limited to, all walls that extend to the deck, fire and smoke walls, soffits and associated framing, ceiling planes, and finish floor planes.

3.4.2. This model will consist of cleaned-up floor plans void of any excessive notations, leaders, bubbles, marks, grid lines, etc. that are not required for detailing development and that may potentially cause a conflict in the base composite model.

3.4.3. In the event of changes to the A/E's contract documents, the A/E must revise the base architectural model/MEP/structural models and distributed to all coordination participants. This will require subcontractor participation as need by A/E to complete the revised models for directive. Revision work will be directed by Owner through an executed change order.

3.4.4. The base architectural models will be distributed and maintained by ABHA and EDiS Company.

3.5. Collation of all trades' detailing models as posted to the project's web-based posting site into a Base Composite Model thru the use of Navisworks.

3.5.1. Establish a standard two inch (2") soft tolerance within the clash detection software. This tolerance will result in a reported clash for any elements drawn closer than two inches (2") to one another.

3.5.2. Assess and include most current clash files including the generation of a clash reports and distribution to all project participants per the coordination schedule.

3.5.3. Collect final as-built files from all trades and generate a Final Coordination Model to submit to CM as part of the close-out requirements.

3.5.4. Coordination meeting minutes shall be kept by EDiS Company Lead Coordinator or EDiS' Project Manager showing issues and resolution dates.

4. REQUIREMENTS OF THE STRUCTURAL STEEL Subcontractor

4.1. Obtain from the A/E Structural Revit files to be used in the generation of the base structural model.

4.2. The structural subcontractor will develop and provide the base structural model within the time frame dictated by EDiS and provide structural model updates to ensure the coordination team is coordinating the MEP/FP to the most up-to-date structural model.

4.3. All structural framing members in the final sizes and locations (typically referred to as a "mill order" or "procurement" model) will be shown in the model as 3D objects with surfaces. At the discretion of the lead coordinator, this model may be void of all hardware and secondary structural steel but should include the major components: primary steel, metal decking, slab on metal decking, and gusset plates.

4.4. The structural insertion/datum point must match the architectural insertion/datum location. No detailing work shall take place until the insertion points of the architectural and structural models match.

4.5. The steel subcontractor is responsible for resolving their own modeling issues (i.e.: steel not to scale, missing key structural components, missing surface data, and model showing as wire frame data, model exported to proper file format, etc.). The steel subcontractor is responsible to provide a steel design model in a usable format for all coordination participants to reference as the base structural model.

4.6. A FINAL 3D steel model and 2D shop drawings shall be submitted to the structural engineer of record, and used for field erection. It must be completed and submitted in accordance to the BIM schedule. This model shall consist of:

4.6.1. All primary and secondary steel including metal deck, slab on metal deck, actual gusset plate sizes, connection details, edge of slab details (pour stop), brick relief angles, embeds, anchor bolts, and other miscellaneous metals. Curtain Wall embeds modeled by others.

4.6.2. Submit final approved files to Lead Coordinator for insertion into the coordinated model, and to the design team in the form of shop drawings and/or Navisworks compatible model.

5. DETAILING REQUIREMENTS OF ALL PARTICIPANTS

5.1. File sharing information:

5.1.1. The in-progress (Coordination Software – Ex: IFC/NWC/Cad) naming convention will be: project-trade-level. Example: Project Designation -MechPipe-1, Project Designation -HVAC-1, Project Designation –Fire Protection-1, Project Designation -Elec-1, Project Designation -Plumbing-1. Project Designation -TeleCom-1 or AV-1, Project Designation –Pneumatic Tube-1, etc. Additional designations may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.

5.1.2. Each model posted by the contractor shall contain sub-layers for the purpose of system identification and isolation during the clash detection process. Example: **HVAC-1** shall contain sub-layers for Supply, Return, Exhaust, Fire Smoke-Dampers, VAV clearance, AC Door Access, Fan Coil Units, FCU Access, Equipment, Equipment Pads, Equipment Clearances, and Hangers (designated per system). **MechPipe-1** shall contain sub-layers Hydronic Pipe Supply, Hydronic Pipe Return, Chilled Pipe Supply, Chilled Pipe Return, Shutoff Access, Equipment, Equipment Pads, Equipment Clearances, and Hangers. **Plumbing-1** shall contain sub-layers Domestic Water Supply, Domestic Water Return, (with additional layer designations for hot and cold), Gas, Med-

Gas, Shutoff Access (designated per system), Sanitary, Vent, Roof Drain, Rain Conductors, Equipment, Equipment Pads, Equipment Clearances, and Hangers (designated per system)**. Elec-1** shall contain sub-layers for Lights, Light Clearance, Conduit, (with additional layer designation for power and data), Cable Tray, Cable Tray Access Clearance, Pull Boxes, Pull Box Access Clearance, J-Boxes, Elec. Panels, Elec. Panel Access Clearance, Elec. Troughs, Elec. Trough Access Clearance, Equipment, Equipment Clearances, Equipment Pads, and Hangers. **Fire Protection1** shall contain sub-layers Mains, Branches, Shutoff Access, and Hangers. **Pneumatic Tube-1** shall contain sub-layers Equipment, Equipment Access, and Hangers. Additional sub layers may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.

5.1.3. Clash detection files will be posted to **BuildingBlok.com** before **12:00 PM**, on **Wednesday and Friday** by each of the trades. The lead coordinator will also post updated coordination models as needed. The lead coordinator will maintain the master coordination files. The weekly coordination model will be name abbreviated Project Name-Floor-Coordination Model-Month-Day-Year.

All coordination participants will maintain a current control copy of their own drawing files outside of the project's web-based posting site. Control drawings are to include all previously posted files.

5.2. Trade Colors in the Coordination environment:

5.2.1. Duct Supply – Dark Green, Duct Return- Light Blue - Duct Exhaust –Light Green, Mech Pipe-Orange, Pressure lines/Gas – Tan, Sanitary/Vent – Brown, Rain Conductors/Roof Drains – Maroon, Domestic Water- Blue, Fire – Red, Pneumatic – Purple, Electrical – Yellow, All Base Architectural Elements (walls, soffits, ceiling & floor planes, etc.) will assume Arch model color scheme saved in the export or Lead Coordinator will modify select color scheme in the coordination model. Steel – Dark Grey, Any hangers and equipment (that is fed per the designated system) will assume the same color of that system it is associated with. Additional color schemes may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.

5.3. When posting drawing files for coordination:

5.3.1. Posted subcontractor coordination files of each trades system should be clash-free with in their respective data. To clarify; trades should refrain from posting data that shows their systems clashing with itself.

5.3.2. When coordination of an area is completed there should not be any unresolved clashes remaining.

5.3.3. These files should be void of any text, dimensions or any other notations.

5.4. Each coordination participant is required to submit three (3) complete sets of installation drawings as well as electronic PDF's prior to any work being installed in the field. If A/E spec requires more or less than that will govern over this document. These complete drawings are to be fully dimensioned and notated. Items to be noted in the final, fully coordinated drawing paper and electronic files of each system include:

5.4.1. Bottom and top elevations of duct, pipe, conduit racks, cable trays etc. must be indicated (where applicable).

5.4.2. Dimensions shall be shown from the gridlines to the centerline of each element drawn (round duct, pipe, cable tray, etc.) and from finished floor.

5.4.3. Height to top of light housing assembly must be indicated.

5.4.4. Labeling of all equipment.

5.5. During the coordination drawing effort, priority will be given to those systems that have the least flexibility. The following list is a descending order of the system priority and shall be used as a general guideline. Throughout the coordination drawing effort, adjustments and deviations to this list can be made with the approval of EDiS Company. (0'- 6") clear above the ceiling shall be maintained for access and construction of the ceiling, whenever possible. Required maintenance and/or code access spaces and set-backs take precedence over all systems.

5.5.1. Gravity Pipe

5.5.2. Plumbing Vent

5.5.3. Ductwork and appurtenances

5.5.4. Cable tray

5.5.5. Recessed light fixtures

5.5.6. Fire protection piping and fixtures

5.5.7. Electrical conduit over (3/4") in diameter

5.5.8. Pneumatic tube and other record or material conveying systems

5.5.9. HVAC piping

5.5.10. Plumbing, supply and medical gas piping

5.5.11. Electrical conduit smaller than 3/4" in diameter

5.5.12. Above ceiling miscellaneous metal supports

5.5.13. Provide all copper tube routes (racks) for mechanical systems, including valves, clearance zones and hangers.

5.6. Items to be included in the detailed drawing progress include:

5.6.1. All systems must be fully detailed and shown as individual elements including ductwork, all piping 3/4" and larger, pneumatic tubing, exterior wall connections, any piping that is smaller than ½" that is racked or banked, etc.

5.6.2. Ductwork is to include size, layout and routing of all metal and flex ductwork, re-heat coils, terminal units, filters registers, grilles, diffusers, and similar features; provide notation for diffuser boot sizes and heights and any other special features

5.6.3. All valves, dampers and VAV's or heat pumps will note any items requiring access for service and maintenance as well as access doors in inaccessible ceilings.

5.6.4. All piping valves, boxes, supports, etc. are to be fully detailed

5.6.5. Sprinkler head locations shall be shown on ceiling plans.

5.6.6. All electrical conduits two inches (2") or more in diameter are to be modeled and shown in addition to smaller diameter conduit that is racked or banked.

5.6.7. Electrical items such as hangers, supports, electrical fixtures, lights, speakers, detectors, sensors, cable trays, raceways, sleeves, pull boxes, and access space claims, etc. must be shown.

5.6.8. If an element is not shown, under the lead coordinators approval, it will be assumed to be field routed and to not interfere with the other elements that are shown or within code clearances. Contractors who field route their elements are responsible to ensure their installation will be feasible and void of creating a clash in the field. Coordinated items take precedence over field routing.

5.6.9. All major hangers and supports (including sway bracing, equipment bracing, hangers, etc.), penetrations, openings must be shown for all systems. Sharing of supports with other systems is discouraged, but can be accomplished with prior owner and/or field inspector approval.

5.6.10. All insulation must be shown with appropriate thicknesses. All insulation & clearance zones will be modeled or accounted for during the clash detection process.

5.6.11. Fire spray: If required by your building type, establish a safe thickness from all structural objects with which to run your clashes. Assume fire spray will be two inches (2") thick.

5.6.12. Engineered stud framing must be modeled for king studs and doors.

5.6.13. Code clearances and maintenance access clearances must be shown and maintained; these include, but are not limited to access to VAVs, air handling units, egresses around pumps and tanks, smoke FDs, electrical panels, pneumatic tube transfer units, cable tray access, pull boxes, valve access, etc.

5.6.14. All trades must coordinate and detail their systems with the intent of installing each system at the optimal elevation above ceiling, taking into consideration, access to equipment for maintenance, repairs, connections, filters and removal while eliminating or minimizing the impact to surrounding components.

5.7. Established Clash Files are to be incorporated to ensure proper coordination. List of those files to be provided by the Lead Coordinator.

5.8. Refer to Appendix B – Soft Clash Requirements for additional soft-clash requirements.

6. SCHEDULE OF DRAWING COMPLETION AND SIGN-OFF

6.1. The participants should plan on the coordination process taking three (3) months. The coordination schedule is as follows:

This table will be populated at the BIM Coordination Kick-off Meeting. OR Schedule to be developed as part of the master construction schedule development (see Section 00230).

Zone	Floor	Coordination Meeting	Sign-Off Date

6.2. At the completion of each floor, the team will determine the specific "priority walls" that will be constructed full-height ahead of other interior partitions and MEP installations.

6.3. 3D MEP/FP Coordination Team

6.3.1. The goal of the coordination team will be to integrate the architectural, structural, mechanical, electrical, fire protection, and project specific elements into a collaborative 3D model to identify and resolve issues pertaining to MEP/FP systems and to ensure succinct and expedited field installations of these systems following the release of each zone/floor after clash free conditions are met. (Filled out at BIM Coordination Kick-off Meeting)

BIM Coordinator	**EDiS Company**
Main Contact	Chris Donahue
Phone Number	302-421-2963
Email Address	cdonahue@ediscompany.com
	EDiS Coordination Team
Main Contact	Hugo DeLaRosa
Phone Number	800-995-3347 x701
Email Address	hdelarosa@ediscompany.com
Project Manager	**EDiS Company**
Main Contact	Kevin Lucas
Phone Number	302-421-2893
Email Address	klucas@ediscompany.com
Project Engineer	**EDiS Company**
Main Contact	Samara Hamilton
Phone Number	302-421-2965
Email Address	shamilton@ediscompany.com
Project Superintendent	**EDiS Company**
Main Contact	Mark Nordquist
Phone Number	302-218-4676
Email Address	mnordquist@ediscompany.com
HVAC	**Worth & Company**
Main Contact	Kris Swanson
Phone Number	267-85-7682
Email Address	kswanson@worthandcompany.com

Electrical	**Nickle Electrical**
Main Contact	Stan Twardus
Phone Number	302-453-4000
Email Address	stwardus@nickle.email
Concrete	**Carrow Construction**
Main Contact	David Talley
Phone Number	302-322-6442
Email Address	david.talley@carrowconstruction.com
Plumbing and Piping	**Worth & Company**
Main Contact	Kris Swanson
Phone Number	267-85-7682
Email Address	kswanson@worthandcompany.com
Architectural	**ABHA Architects**
Main Contact	Chandra Nilekani
Phone Number	302-658-6426
Email Address	cnilekani@abha.com
MEP/FP Engineers	**Gipe Associates**
Main Contact	Adam Kegan
Phone Number	410-822-8688
Email Address	akegan@gipe.net
Structural Steel	**Summit Steel**
Main Contact	Joe Nicotra
Phone Number	302-325-3220
Email Address	summitst1@verizon.net
Miscellaneous Steel	**Summit Steel**
Main Contact	Joe Nicotra
Phone Number	302-325-3220
Email Address	summitst1@verizon.net

EXHIBIT 1

ARTICLE 1: GENERAL PROVISIONS

1.1 This document defines protocols, expected levels of development, and authorized uses of Building Information Models on this Project. It assigns specific responsibility for the development of each Model Element to a defined Level of Development at each Project phase. Where a provision in this Exhibit conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Exhibit will prevail.

1.1.1 The parties agree to incorporate this Exhibit by reference into any other agreement for services or construction for the Project.

ARTICLE 2: LEVEL OF DEVELOPMENT (LOD)

2.1 The following LOD descriptions identify the specific content requirements and associated authorized uses for each Model Element at five progressively detailed levels of completeness. Each subsequent LOD builds on the previous level and includes all the characteristics of previous levels.

2.2 **LOD 100**

2.2.1 **Model Content Requirements**. Overall building massing indicative of area, height, volume, location, and orientation may be modeled in three dimensions or represented by other data.

2.2.2 **Authorized Uses**

2.2.2.1 **Analysis**. The Model may be analyzed based on volume, area and orientation by application of generalized performance criteria assigned to the representative Model Elements.

2.2.2.2 **Cost Estimating**. The Model may be used to develop a cost estimate based on current area, volume or similar conceptual estimating techniques (e.g., square feet of floor area, condominium unit, hospital bed, etc.).

2.2.2.3 **Schedule**. The Model may be used for project phasing and overall duration.

2.3 **LOD 200**

2.3.1 **Model Content Requirements**. Model Elements are modeled as generalized systems or assemblies with approximate quantities, size, shape, location, and orientation. Non-geometric information such as object name and quantities should be attached to Model Elements.

2.3.2 **Authorized Uses**

2.3.2.1 **Analysis**. The Model may be analyzed for performance of selected systems by application of generalized performance criteria assigned to the representative Model Elements.

2.3.2.2 **Cost Estimating**. The Model may be used to develop conceptual cost estimates based on the approximate data provided and conceptual estimating techniques (e.g., volume and quantity of elements or type of system selected).

2.3.2.3 **Schedule**. The Model may be used to show ordered, time-scaled appearance of major elements and systems.

2.4 **LOD 300**

2.4.1 **Model Content Requirements**. Model Elements are modeled as specific assemblies accurate in terms of quantity, size, shape, location, and orientation. Existing building elements are modeled as shown on building record drawings. Non-geometric information such as object description and object tags (door number, equipment number, etc) and quantities should be included with each object. Examples of the details required for systems modeled to LOD 300 include, but are not limited to:

- Site Utilities
- Masonry
- Steel decking
- Correct slopes for gravity piping for sanitary, storm or wet fire suppression systems.
- Piping materials specifically called out on documents included with model element attributes (generic manufacturer for system components are acceptable).
- Insulation around Pipe and Ducting.
- Duct dampers included with the duct system.
- Doors/Frames (hollow metal and storefront)
- Owner Furnished Fixtures, Equipment, etc. generically modeled as space claims by the Model Element Author (MEA).

2.4.2 **Authorized Uses**

2.4.2.1 **Construction**. Suitable for the generation of traditional construction documents. Contractors may utilize this model for coordination purposes and creation of shop drawings.

2.4.2.2 **Analysis**. The Model may be analyzed for performance of selected systems by application of specific performance criteria assigned to the representative Model Elements.

2.4.2.3 **Schedule**. The Model may be used to show ordered, time-scaled appearance of detailed elements and systems.

2.5 **LOD 400**

2.5.1 **Model Content Requirements.** Model Elements are modeled as specific assemblies that are accurate in terms of size, shape, location, quantity, and orientation with complete fabrication, assembly, and detailing information. Non-geometric information such as manufacturer name, model and installation should also be included with each object in addition to the information added in LOD 300. Examples of items and details required in LOD 400 models include, but are not limited to:

- Concrete
- Concrete reinforcing steel (in plank)
- Anchor bolts
- Structural steel
- Steel stairs, handrails

- Floor/roof penetration steel
- Significantly sized support hangers and stanchions for all systems
- Uni-Strut associated with system components if it is located in a tight overhead space (case by case basis)
- Architectural millwork/casework
- Metal panels and support steel
- Curtainwall system
- Steel stud framing including kickers and trusses at floor penetrations.
- Valve locations (clearance)
- Access panels (these should be modeled with the system they provide access to).
- Conduit racks or other substantially wide / bundled electrical routing. (these can be generically modeled, i.e. extruded boxes, space claims)
- Single conduit runs associated with any system (lighting, power, controls, etc) if needed to coordinate concrete coring.
- Kitchen equipment
- MEP/FP & Low Voltage Equipment
- MEP/FP & Low Voltage Systems
- Pull box locations and any extra space claims for their access.

2.5.2 **Authorized Uses**

2.5.2.1 **Construction**. Model Elements are virtual representations of the proposed element and are suitable or construction.

2.5.2.2 **Analysis**. The Model may be analyzed for performance of approved selected systems based on specific Model Elements.

2.5.2.3 **Schedule**. The Model may be used to show ordered, time-scaled appearance of detailed specific elements and systems including construction means and methods.

2.6 **LOD 500**

2.6.1 **Model Content Requirements**. Model Elements are modeled as constructed assemblies actual and accurate in terms of size, shape, location, quantity, and orientation. Non-geometric information should be updated with actual installed items.

2.6.2 **Authorized Uses**

2.6.2.1 **General Usage**. The Model may be utilized for maintaining, altering, and adding to the Project, but only to the extent consistent with any licenses granted in the Agreement or in a separate licensing agreement.

2.6.2.2 **Other Authorized Uses**. The Model will be a tool for accessing as-built information for facility management and maintenance purposes.

ARTICLE 3: MODEL ELEMENTS

3.1 **Reliance on EDiS Company's Model Element Matrix**

3.1.1 The EDiS Company Model Element Matrix at the end of this section identifies (1) the LOD required for each Model Element at the end of each Project phase, and (2) the Model Element Author responsible for developing the Model Element to the LOD identified. Each Model Element Author's content is intended to be shared with subsequent Model Element Authors and Model Users throughout the course of the Project.

3.1.2 It is understood that while the content of a specific Model Element may include data that exceeds the required LOD identified in the Model Element Table for a particular phase, Model Users and subsequent Model Element Authors may rely on the accuracy and completeness of a Model Element consistent only with the content required for a LOD identified in the Model Element Table.

3.1.3 Any use of, or reliance on, a Model Element inconsistent with the LOD indicated in the Model Element Table by subsequent Model Element Authors or Model Users shall be at their sole risk and without liability to the Model Element Author. To the fullest extent permitted by law, subsequent Model Element Authors and Model Users shall indemnify and defend the Model Element Author from and against all claims arising from or related to the subsequent Model Element Author's or Model User's modification to, or unauthorized use of, the Model Element Author's content.

3.2 **Table Instructions**

3.2.1 The Model Element Table at the end of this section indicates the LOD to which each Model Element Author (MEA) is required to develop the content of the Model Element at the conclusion of each phase of the Project. EDiS Company holds the rights of this table and all ownership right for edits are performed via EDiS Company.

3.3 EDiS Company's Model Element Matrix AIA Document G202-2013 (attached).

END OF SECTION

AIA® Document E203™ – 2013

Building Information Modeling and Digital Data Exhibit

This Exhibit dated the 6th day of February in the year 2017 is incorporated into the agreement (the "Agreement") between the Parties for the following Project:
(Name and location or address of the Project)

Renovations to Howard High School of Technology
401 East 12th Street
Wilmington, Delaware 19801

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

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

This document is intended to be incorporated into an agreement between the parties and used in conjunction with AIA Documents G201™–2013, Project Digital Data Protocol Form, and G202™–2013, Building Information Modeling Protocol Form. It is anticipated that other Project Participants will incorporate a project specific E203–2013 into their agreements, and that the Parties and other Project Participants will set forth the agreed-upon protocols in AIA Documents G201–2013 and G202–2013.

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 TRANSMISSION AND OWNERSHIP OF DIGITAL DATA

3 DIGITAL DATA PROTOCOLS

4 BUILDING INFORMATION MODELING PROTOCOLS

5 OTHER TERMS AND CONDITIONS

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 This Exhibit provides for the establishment of protocols for the development, use, transmission, and exchange of Digital Data for the Project. If Building Information Modeling will be utilized, this Exhibit also provides for the establishment of the protocols necessary to implement the use of Building Information Modeling on the Project, including protocols that establish the expected Level of Development for Model Elements at various milestones of the Project, and the associated Authorized Uses of the Building Information Models.

§ 1.2 The Parties agree to incorporate this Exhibit into their agreements with any other Project Participants that may develop or make use of Digital Data on the Project. Prior to transmitting or allowing access to Digital Data, a Party may require any Project Participant to provide reasonable evidence that it has incorporated this Exhibit into its agreement for the Project, and agreed to the most recent Project specific versions of AIA Document G201™–2013, Project Digital Data Protocol Form and AIA Document G202™–2013, Project Building Information Modeling Protocol Form.

§ 1.2.1 The Parties agree that each of the Project Participants utilizing Digital Data on the Project is an intended third party beneficiary of the Section 1.2 obligation to incorporate this Exhibit into agreements with other Project Participants, and any rights and defenses associated with the enforcement of that obligation. This Exhibit does not create any third-party beneficiary rights other than those expressly identified in this Section 1.2.1.

§ 1.3 Adjustments to the Agreement

§ 1.3.1 If a Party believes that protocols established pursuant to Sections 3.2 or 4.5, and memorialized in AIA Documents G201–2013 and G202–2013, will result in a change in the Party's scope of work or services warranting an adjustment in compensation, contract sum, schedule or contract time, the Party shall notify the other Party. Failure to provide notice as required in this Section 1.3 shall result in a Party's waiver of any claims for

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adjustments in compensation, contract sum, schedule or contract time as a result of the established protocols.

§ 1.3.2 Upon such notice, the Parties shall discuss and negotiate revisions to the protocols or discuss and negotiate any adjustments in compensation, contract sum, schedule or contract time in accordance with the terms of the Agreement.

§ 1.3.3 Notice required under this Section 1.3 shall be provided within thirty days of receipt of the protocols, unless otherwise indicated below:
(If the Parties require a notice period other than thirty days from receipt of the protocols, indicate the notice period below.)

§ 1.4 Definitions

§ 1.4.1 Building Information Model. A Building Information Model is a digital representation of the Project, or a portion of the Project, and is referred to in this Exhibit as the "Model," which term may be used herein to describe a Model Element, a single model or multiple models used in the aggregate, as well as other data sets identified in AIA Document G202–2013, Project Building Information Modeling Protocol Form.

§ 1.4.2 Building Information Modeling. Building Information Modeling or Modeling means the process used to create the Model.

§ 1.4.3 Model Element. A Model Element is a portion of the Model representing a component, system or assembly within a building or building site.

§ 1.4.4 Level of Development. The Level of Development (LOD) describes the minimum dimensional, spatial, quantitative, qualitative, and other data included in a Model Element to support the Authorized Uses associated with such LOD.

§ 1.4.5 Authorized Uses. The term "Authorized Uses" refers to the permitted uses of Digital Data authorized in the Digital Data and/or Building Information Modeling protocols established pursuant to the terms of this Exhibit.

§ 1.4.6 Model Element Author. The Model Element Author is the entity (or individual) responsible for managing and coordinating the development of a specific Model Element to the LOD required for an identified Project milestone, regardless of who is responsible for providing the content in the Model Element. Model Element Authors are to be identified in Section 3.3, Model Element Table, of AIA Document G202–2013.

§ 1.4.7 Digital Data. Digital Data is information, including communications, drawings, specifications and designs, created or stored for the Project in digital form. Unless otherwise stated, the term Digital Data includes the Model.

§ 1.4.8 Confidential Digital Data. Confidential Digital Data is Digital Data containing confidential or business proprietary information that the transmitting party designates and clearly marks as "confidential."

§ 1.4.9 Written or In Writing. In addition to any definition in the Agreement to which this Exhibit is attached, for purposes of this Exhibit and the Agreement, "written" or "in writing" shall mean any communication prepared and sent using a transmission method set forth in this Exhibit, or the protocols developed pursuant to this Exhibit, that permits the recipient to print the communication.

§ 1.4.10 Written Notice. In addition to any terms in the Agreement to which this Exhibit is attached, for purposes of this Exhibit and the Agreement, "written notice" shall be deemed to have been duly served if transmitted electronically to an address provided in this Exhibit or the Agreement using a transmission method set forth in this Exhibit that permits the recipient to print the communication.

§ 1.4.11 Party and Parties. The terms "Party" and "Parties" refer to the signing parties to the Agreement.

§ 1.4.12 Project Participant. A Project Participant is an entity (or individual) providing services, work, equipment or materials on the Project and includes the Parties.

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ARTICLE 2 TRANSMISSION AND OWNERSHIP OF DIGITAL DATA

§ 2.1 The transmission of Digital Data constitutes a warranty by the Party transmitting Digital Data to the Party receiving Digital Data that the transmitting Party is the copyright owner of the Digital Data, or otherwise has permission to transmit the Digital Data for its use on the Project in accordance with the Authorized Uses of Digital Data established pursuant to the terms of this Exhibit.

§ 2.2 If a Party transmits Confidential Digital Data, the transmission of such Confidential Digital Data constitutes a warranty to the Party receiving such Confidential Digital Data that the transmitting Party is authorized to transmit the Confidential Digital Data. If a Party receives Confidential Digital Data, the receiving Party shall keep the Confidential Digital Data strictly confidential and shall not disclose it to any other person or entity except as set forth in Section 2.2.1.

§ 2.2.1 The receiving Party may disclose Confidential Digital Data as required by law or court order, including a subpoena or other form of compulsory legal process issued by a court or governmental entity. The receiving Party may also disclose the Confidential Digital Data to its employees, consultants or contractors in order to perform services or work solely and exclusively for the Project, provided those employees, consultants and contractors are subject to the restrictions on the disclosure and use of Confidential Digital Data as set forth in this Exhibit.

§ 2.3 By transmitting Digital Data, the transmitting Party does not convey any ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate license, the receiving Party's right to use, modify, or further transmit Digital Data is specifically limited to designing, constructing, using, maintaining, altering and adding to the Project consistent with the terms of this Exhibit, and nothing contained in this Exhibit conveys any other right to use the Digital Data.

§ 2.4 Where a provision in this Article 2 conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Article 2 shall prevail.

ARTICLE 3 DIGITAL DATA PROTOCOLS

§ 3.1 Anticipated Types of Digital Data. The anticipated types of Digital Data to be used on the Project are as follows: *(Indicate below the information on the Project that shall be created and shared in a digital format. If the Parties indicate that Building Information Modeling will be utilized on the Project, the Parties shall also complete Article 4.)*

Anticipated Digital Data	**Applicability to the Project** *(Indicate Applicable or Not Applicable)*	**Location of Detailed Description** *(Section 3.1.1 below or in an attachment to this exhibit and identified below)*
Project Agreements and Modifications	Applicable	
Project communications	Applicable	
Architect's pre-construction submittals	Applicable	
Contract Documents	Applicable	
Contractor's submittals	Applicable	
Subcontractor's submittals	Applicable	
Modifications	Applicable	
Project payment documents	Applicable	
Notices and claims	Applicable	
Building Information Modeling	Applicable	

§ 3.1.1 Insert a detailed description of the anticipated Digital Data identified in Section 3.1, if not further described in an attachment to this Exhibit.

See attached Exhibit

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§ **3.2** As soon as practical following execution of the Agreement, the Parties shall further describe the uses of Digital Data, and establish necessary protocols governing the transmission and Authorized Uses of Digital Data, in consultation with the other Project Participants that are expected to utilize Digital Data on the Project.

§ **3.2.1** Unless another Project Participant is identified below, the Architect shall prepare and distribute to the other Project Participants Digital Data protocols for review, revision and approval.
(If a Project Participant other than the Architect shall be responsible for preparing draft and final Digital Data protocols, identify that Project Participant.)

EDiS Company

§ **3.2.2** The agreed upon Digital Data protocols shall be set forth in AIA Document G201–2013 and each Project Participant shall memorialize their agreement in writing to such Digital Data protocols.

§ **3.2.3** The Parties, together with the other Project Participants, shall review and, if necessary, revise the Digital Data protocols at appropriate intervals as required by the conditions of the Project.

§ **3.3** The Parties shall transmit, use, store and archive Digital Data in accordance with the Digital Data protocols set forth in the latest version of AIA Document G201–2013 agreed to by the Project Participants.

§ 3.4 Unauthorized Use
§ 3.4.1 Prior to Establishment of Digital Data Protocols
If a Party receives Digital Data prior to the agreement to, and documentation of, the Digital Data protocols in AIA Document G201–2013, that Party is not authorized to use or rely on the Digital Data. Any use of, or reliance on, such Digital Data is at that Party's sole risk and without liability to the other Party and its contractors, consultants, agents and employees.

§ 3.4.2 Following Establishment of Digital Data Protocols
Following agreement to, and documentation of, the Digital Data protocols in AIA Document G201–2013, if a Party uses Digital Data inconsistent with the Authorized Uses identified in the Digital Data protocols, that use shall be at the sole risk of the Party using the Digital Data.

§ 3.5 Digital Data Management
§ **3.5.1** Centralized electronic document management system use on the Project shall be:
(Check the appropriate box. If the Parties do not check one of the boxes below, the default selection shall be that the Parties will not utilize a centralized electronic document management system on the Project.)

[**X**] The Parties intend to use a centralized electronic document management system on the Project.

[ ]The Parties do not intend to use a centralized electronic document management system on the Project.

§ **3.5.2** If the Project Participants intend to utilize a centralized electronic document management system on the Project, the Project Participants identified in Section 3.5.3 shall be responsible for managing and maintaining such system. The Project Participants responsible for managing and maintaining the centralized electronic document management system shall facilitate the establishment of protocols for transmission, use, storage and archiving of the centralized Digital Data and assist the Project Participants identified in Section 3.2.1 above in preparing Digital Data protocols. Upon agreement to, and documentation of, the Digital Data protocols in AIA Document G201–2013, the Project Participants identified in Section 3.5.3 shall manage and maintain the centralized electronic document management system consistent with the management protocols set forth in the latest version of G201–2013 approved by the Project Participants.

§ **3.5.3** Unless responsibility is assigned to another Project Participant, the Architect shall be responsible for managing and maintaining the centralized electronic document management system. If the responsibility for management and maintenance will be assigned to another Project Participant at an identified Project milestone, indicate below the Project Participant who shall assume that responsibility, and the Project milestone.
(Identify the Project Participant responsible for management and maintenance only if the Parties intend to utilize a centralized electronic document management system on the Project.)

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Responsible Project Participant	Project Milestone
EDiS Company	Bid Package A, B & D, Closeout

ARTICLE 4 BUILDING INFORMATION MODELING PROTOCOLS

§ 4.1 If the Parties indicate in Section 3.1 that Building Information Modeling will be used on the Project, specify below the extent to which the Parties intend to utilize Building Information Modeling and identify the provisions of this Article 4 governing such use:

[ ]The Parties shall utilize Building Information Modeling on the Project for the sole purpose of fulfilling the obligations set forth in the Agreement without an expectation that the Model will be relied upon by the other Project Participants. Unless otherwise agreed in writing, any use of, transmission of, or reliance on the Model is at the receiving Party's sole risk. The remaining sections of this Article 4 shall have no force or effect.

[ ]The Parties shall develop, share, use and rely upon the Model in accordance with Sections 4.2 through 4.10 of this Exhibit.

§ 4.2 Anticipated Building Information Modeling Scope. Indicate below the portions of the Project for which Modeling will be used and the anticipated Project Participant responsible for that Modeling.

Project Portion for Modeling	Responsible Project Participant
Bid Package A:	
HHS-05	Structural and Miscellaneous Steel
HHS-07	Metal Framing, Drywall, Plaster
HHS-08	Acoustical Ceilings and Panels
HHS-17	Conveying Equipment
Bid Package B:	
HHS-19	Mechanical & Plumbing
HHS-20	Electrical and IT Infrastructure
HHS-21	Fire Protection
HHS-24	ATC
HHS-25	Conveying Equipment
Bid Package D:	
HHS-35	Metal Framing, Drywall, Plaster
HHS-36	Acoustical Ceilings and Panels

§ 4.3 Anticipated Model Authorized Uses. Indicate below the anticipated Authorized Uses of the Model for the Project, which Authorized Uses will be agreed upon by the Project Participants and further described for each LOD in AIA Document G202–2013.

§ 4.4 Ancillary Modeling Activities. Indicate additional Modeling activities agreed upon by the Parties, but not to be included in AIA Document G202–2013, if any.
(Describe any Modeling activities, such as renderings, animations, performance simulations, or other similar use, including the anticipated amount and scope of any such Modeling activities.)

All parties identified in contract scopes and AIA E203 4.2 are required to provide 3D modeled electronic document in Autocad, Navisworks and/or Revit to participate in Building Information Modeling construction coordination process.

§ 4.5 Modeling Protocols. As soon as practical following execution of the Agreement, the Parties shall, in consultation with the other Project Participants that are expected to utilize Building Information Modeling on the Project, further describe the Authorized Uses of the Model and establish necessary protocols governing the

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development of the Model utilizing AIA Document G202–2013.

§ 4.5.1 The Modeling protocols shall address the following:

- **.1** Identification of the Model Element Authors;
- **.2** Definition of the various LOD for the Model Elements and the associated Authorized Uses for each defined LOD;
- **.3** Identification of the required LOD of each Model Element at each identified Project milestone;
- **.4** Identification of the construction classification systems to be used on the Project;
- **.5** The process by which Project Participants will exchange and share the Model at intervals not reflected in Section 3.3, Model Element Table, of AIA Document G202–2013;
- **.6** The process by which the Project Participants will identify, coordinate and resolve changes to the Model;
- **.7** Details regarding any anticipated as-designed or as-constructed Authorized Uses for the Model, if required on the Project;
- **.8** Anticipated Authorized Uses for facilities management or otherwise, following completion of the Project; and
- **.9** Other topics to be addressed by the Modeling protocols: *(Identify additional topics to be addressed by the Modeling Protocols.)*

§ 4.5.2 Unless responsibility is assigned to another Project Participant identified below, the Architect shall prepare and distribute Modeling protocols to the other Project Participants for review, revision and approval.
(If a Project Participant other than the Architect shall be responsible for preparing draft and final Modeling protocols, identify that Project Participant.)

§ 4.5.3 The agreed upon Modeling protocols shall be set forth in AIA Document G202–2013 and each Project Participant shall memorialize their agreement in writing to such Modeling protocols.

§ 4.5.4 The Parties, together with the other Project Participants, shall review, and if necessary, revise the Modeling protocols at appropriate intervals as required by the conditions of the Project.

§ 4.6 The Parties shall develop, use and rely on the Model in accordance with the Modeling protocols set forth in the latest version of AIA Document G202–2013, which document shall be included in or attached to the Model in a manner clearly accessible to the Project Participants.

§ 4.7 Unauthorized Use

§ 4.7.1 Prior to Establishment of Modeling Protocols

If a Party receives any Model prior to the agreement to, and documentation of, the Modeling protocols in AIA Document G202–2013, that Party is not authorized to use, transmit, or rely on the Model. Any use, transmission or reliance is at that Party's sole risk and without liability to the other Party and its contractors, consultants, agents and employees.

§ 4.7.2 Following Establishment of Modeling Protocols

Following agreement to, and documentation of, the Modeling protocols in AIA Document G202–2013, if a Party uses or relies on the Model inconsistent with the Authorized Uses identified in the Modeling protocols, such use or reliance shall be at the sole risk of the Party using or relying on the Model. A Party may rely on the Model Element only to the extent consistent with the minimum data required for the identified LOD, even if the content of a specific Model Element includes data that exceeds the minimum data required for the identified LOD.

§ 4.8 Model Management

§ 4.8.1 The requirements for managing the Model include the duties set forth in this Section 4.8. Unless assigned to another Project Participant, the Architect shall manage the Model from the inception of the Project. If the responsibility for Model management will be assigned to another Project Participant, or change at an identified

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Project milestone, indicate below the identity of the Project Participant who will assume that responsibility, and the Project milestone.

Responsible Project Participant **Project Milestone**

§ 4.8.2 Model Management Protocol Establishment. The Project Participant responsible for managing the Model, in consultation with the other Project Participants that are expected to utilize Building Information Modeling on the Project, shall facilitate the establishment and revision of Model management protocols, including the following:

- **.1** Model origin point, coordinate system, precision, file formats and units
- **.2** Model file storage location(s)
- **.3** Processes for transferring and accessing Model files
- **.4** Naming conventions
- **.5** Processes for aggregating Model files from varying software platforms
- **.6** Model access rights
- **.7** Identification of design coordination and clash detection procedures.
- **.8** Model security requirements
- **.9** Other: *(Identify additional Model management protocols to be addressed.)*

§ 4.8.3 Ongoing Responsibilities. The Project Participant responsible for managing the Model shall do so consistent with the Model management protocols, which shall also include the following ongoing responsibilities:

- **.1** Collect incoming Models:
  - **.1** Coordinate submission and exchange of Models
  - **.2** Create and maintain a log of Models received
  - **.3** Review Model files for consistency with Sections 4.8.2.1 through 4.8.2.5
  - **.4** Maintain a record copy of each Model file received
- **.2** Aggregate Model files and make them available for Authorized Uses
- **.3** Maintain Model Archives and backups consistent with the requirements of Section 4.8.4 below
- **.4** Manage Model access rights
- **.5** Other: *(Identify additional responsibilities.)*

§ 4.8.4 Model Archives. The individual or entity responsible for Model management as set forth in this Section 4.8 shall compile a Model Archive at the end of each Project milestone and shall preserve it without alteration as a record of Model completion as of that Project milestone.

§ 4.8.4.1 Additional Model Archive requirements, if any, are as follows:

§ 4.8.4.2 The procedures for storing and preserving the Model(s) upon final completion of the Project are as follows:

§ 4.9 Post-Construction Model. The services associated with providing a Model for post-construction use shall only be required if specifically designated in the table below as a Party's responsibility.
(Designate below any anticipated post-construction Model and related requirements, the Project Participant responsible for creating or adapting the Model to achieve such uses, and the location of a detailed description of the anticipated scope of services to create or adapt the Model as necessary to achieve such uses.)

Post-Construction Model	**Applicability to Project** *(Applicable or Not Applicable)*	**Responsible Project Participant**	**Location of Detailed Description of Requirements and Services** *(Section 4.10 below or in an attachment to this exhibit and identified below)*

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§ 4.9.1	Remodeling	Not Applicable		
§ 4.9.2	Wayfinding and Mapping	Not Applicable		
§ 4.9.3	Asset/FF & E Management	Not Applicable	EDiS Company	
§ 4.9.4	Energy Management			
§ 4.9.5	Space Management			
§ 4.9.6	Maintenance Management			

§ 4.10 Insert a detailed description of the requirements for each Post-Construction Model identified in Section 4.9 and the anticipated services necessary to create each Post-Construction Model, if not further described in an attachment to this Exhibit.

ARTICLE 5 OTHER TERMS AND CONDITIONS

Other terms and conditions related to the transmission and use of Digital Data are as follows:

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NCC Vocational Technical School
Renovations to Howard High School of Technology
Project Building Information Modeling (BIM)
Scope Participant List

Bid Package A:

Contract HHS-05	Structural and Miscellaneous Steel
Contract HHS-07	Metal Framing, Drywall, Plaster
Contract HHS-08	Acoustical Ceilings and Panels
Contract HHS-17	Conveying Equipment

Bid Package B:

Contract HHS-19	Mechanical & Plumbing
Contract HHS-20	Electrical and IT Infrastructure
Contract HHS-21	Fire Protection
Contract HHS-22	Testing, Adjusting and Balancing
Contract HHS-24	ATC
Contract HHS-25	Conveying Equipment

Bid Package D:

Contract HHS-35	Metal Framing, Drywall, Plaster
Contract HHS-36	Acoustical Ceilings and Panels

AIA® Document G202™ – 2013

Project Building Information Modeling Protocol Form

(Row deleted)

PROJECT:
Renovations to Howard High School of Technology
401 East 12th Street
Wilmington, Delaware 19801

PROTOCOL VERSION NUMBER: 1
DATE: February 6,2017
PREPARED BY: Chris Donahue/Jackie McKee
DISTRIBUTION TO
New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, Delaware 19804

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

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

This document is intended to be used in conjunction with a Project specific AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, which the Parties will incorporate into their agreement for the Project, and a Project specific AIA Document G201™–2013, Project Digital Data Protocol Form.

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 LEVEL OF DEVELOPMENT

3 MODEL ELEMENTS

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 For each Project Participant that has incorporated the Project specific AIA Document E203™–2013, Building Information Modeling and Digital Data Protocol Exhibit, dated February 6, 2017 , into its agreement for the Project, identify and provide the contact information for individuals responsible for implementation of the Modeling protocols. If, for any Project Participant, more than one individual will be responsible for implementation of the Modeling protocols, list each individual separately and describe the unique Modeling Role assigned to each individual.

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User Notes:

Modeling Role	Project Participant	Individual Responsible	Contact Information
BIM Manager	EDiS BIM Services	Chris Donahue	EDiS Company 110 South Poplar Street, Suite 300 Wilmington, De 19801 302-421-2963 cdonahue@ediscompany.com

§ 1.2 This document establishes the Modeling protocols for the Project. For purposes of these protocols, the Model is comprised of the following information and other data sets:
(Paragraph deleted)

§ 1.3 Collaboration Protocols. The Project Participants' protocols for the collaborative utilization of the Model, if any, including communications protocols, a collaboration meeting schedule and colocation requirements, are as follows:

§ 1.4 Technical Requirements. The technical requirements relating to the utilization of Building Information Modeling, including specific software and hardware requirements are as follows:

Revit, Navisworks, Bluebeam Autodesk fabrication

§ 1.5 Training and Support. –NOT USED

§ 1.6 Model Standard. The Model shall be developed in accordance with the following Model Standard, if any:

§ 1.7 Model Management Protocols and Processes
The following Model Management Protocols and Processes shall apply to the Project only if specifically designated in the table below as being applicable.

Model Management Protocols and Processes	Applicability to Project	Location of Detailed Description
§ 1.7.1 Model origin point, coordinate system, precision, file formats and units	Applicable	0, 0, 0
§ 1.7.2 Model file storage location(s)	Applicable	EDiS BIM Services & Newforma
§ 1.7.3 Processes for transferring and accessing Model files	Applicable	Drop Box & BuildingBlok
§ 1.7.4 Naming conventions	Applicable	EDiS Standard
§ 1.7.5 Processes for aggregating Model files from varying software platforms		Autodesk CAD MEP & Navisworks
§ 1.7.6 Model access rights	N/A	
§ 1.7.7 Design coordination and clash detection procedures.	Applicable	EDiS
§ 1.7.8 Model security requirements	Applicable	Confidential Between EDiS, ABHA & NCC Vo-Tech School District

§ 1.8 Insert a description of each Model Management Protocol and Process identified in Section 1.7, if not further described in an exhibit attached to this document:

See attached document.

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§ **1.9** Terms in this document shall have the same meaning as those in AIA Document E203–2013.

ARTICLE 2 LEVEL OF DEVELOPMENT

§ **2.1** The Level of Development (LOD) descriptions, included in Section 2.2 through Section 2.6 below, identify the specific minimum content requirements and associated Authorized Uses for each Model Element at five progressively detailed levels of completeness. The Parties shall utilize the five LOD descriptions in completing the Model Element Table at Section 3.3.

§ 2.2 LOD 100 – NOT USED

§ **2.2.1 Model Element Content Requirements.** The Model Element may be graphically represented in the Model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200. Information related to the Model Element (i.e., cost per square foot, tonnage of HVAC, etc.) can be derived from other Model Elements.

§ 2.2.2 Authorized Uses

§ **2.2.2.1 Analysis.** The Model Element may be analyzed based on volume, area and orientation by application of generalized performance criteria assigned to other Model Elements.

§ **2.2.2.2 Cost Estimating.** The Model Element may be used to develop a cost estimate based on current area, volume or similar conceptual estimating techniques (e.g., square feet of floor area, condominium unit, hospital bed, etc.).

§ **2.2.2.3 Schedule.** The Model Element may be used for Project phasing and determination of overall Project duration.

§ **2.2.2.4 Other Authorized Uses.** Additional Authorized Uses of the Model Element developed to LOD 100, if any, are as follows:

§ 2.3 LOD 200 – NOT USED

§ **2.3.1 Model Element Content Requirements.** The Model Element is graphically represented within the Model as a generic system, object, or assembly with approximate quantities, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.

§ 2.3.2 Authorized Uses

§ **2.3.2.1 Analysis.** The Model Element may be analyzed for performance of selected systems by application of generalized performance criteria assigned to the representative Model Elements.

§ **2.3.2.2 Cost Estimating.** The Model Element may be used to develop cost estimates based on the approximate data provided and quantitative estimating techniques (e.g., volume and quantity of elements or type of system selected).

§ **2.3.2.3 Schedule.** The Model Element may be used to show ordered, time-scaled appearance of major elements and systems.

§ **2.3.2.4 Coordination.** The Model Element may be used for general coordination with other Model Elements in terms of its size, location and clearance to other Model Elements.

§ **2.3.2.5 Other Authorized Uses.** Additional Authorized Uses of the Model Element developed to LOD 200, if any, are as follows:

§ 2.4 LOD 300 – Refer to Section 01370 – BIM Coordination (attached)

§ **2.4.1 Model Element Content Requirements.** The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.

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§ 2.4.2 Authorized Uses

§ 2.4.2.1 Analysis. The Model Element may be analyzed for performance of selected systems by application of specific performance criteria assigned to the representative Model Element.

§ 2.4.2.2 Cost Estimating. The Model Element may be used to develop cost estimates suitable for procurement based on the specific data provided.

§ 2.4.2.3 Schedule. The Model Element may be used to show ordered, time-scaled appearance of detailed elements and systems.

§ 2.4.2.4 Coordination. The Model Element may be used for specific coordination with other Model Elements in terms of its size, location and clearance to other Model Elements including general operation issues.

§ 2.4.2.5 Other Authorized Uses. Additional Authorized Uses of the Model Element developed to LOD 300, if any, are as follows:

§ 2.5 LOD 400

§ 2.5.1 Model Element Content Requirements. The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information. Non-graphic information may also be attached to the Model Element.

§ 2.5.2 Authorized Uses

§ 2.5.2.1 Analysis. The Model Element may be analyzed for performance of systems by application of actual performance criteria assigned to the Model Element.

§ 2.5.2.2 Cost Estimating. Costs are based on the actual cost of the Model Element at buyout.

§ 2.5.2.3 Schedule. The Model may be used to show ordered, time-scaled appearance of detailed specific elements and systems including construction means and methods.

§ 2.5.2.4 Coordination. The Model Element may be used for coordination with other Model Elements in terms of its size, location and clearance to other Model Elements, including fabrication, installation and detailed operation issues.

§ 2.5.2.5 Other Authorized Uses. Additional Authorized Uses of the Model Element developed to LOD 400, if any, are as follows:

§ 2.6 LOD 500 – NOT USED

§ 2.6.1 Model Element Content Requirements. The Model Element is a field verified representation in terms of size, shape, location, quantity, and orientation. Non-graphic information may also be attached to the Model Elements.

§ 2.6.2 Authorized Uses. Specific Authorized Uses of the Model Element developed to LOD 500, if any, are as follows:

ARTICLE 3 MODEL ELEMENTS

§ 3.1 Reliance on Model Elements

§ 3.1.1 At any particular Project milestone, a Project Participant may rely on the accuracy and completeness of a Model Element only to the extent consistent with the minimum data required for the Model Element's LOD for that Project milestone as identified below in the Model Element Table, even if the content of a specific Model Element includes data that exceeds the minimum data required for the identified LOD.

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§ 3.1.2 Coordination and Model Refinement

Where conflicts are found in the Model, regardless of the phase of the Project or LOD, the Project Participant that identifies the conflict shall promptly notify the Model Element Authors and the Project Participant identified in AIA Document E203–2013 Section 4.8 as being responsible for Model management. Upon such notification, the Model Element Author(s) shall act promptly to evaluate, mitigate and resolve the conflict in accordance with the processes established in Section 1.7.7, if applicable.

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§ 3.2 Table Instructions

§ 3.2.1 The Model Element Table in Section 3.3 indicates the LOD to which each Model Element shall be developed at each identified Project milestone and the Model Element Author.

§ 3.2.2 Abbreviations for each Model Element Author to be used in the Model Element Table are as follows:

Abbreviation	Model Element Author (MEA)
ABHA	Anderson, Brown & Higley Architects
EDiS	EDiS Company
BP	Bid Package

§ 3.3 Model Element Table *Abbreviations:* *ABHA - Anderson, Brown & Higley Architects* *EDiS - EDiS Company* *BP - Bid Package*	*Design Intent Model*			*Design Development*			*Construction Documents*			*Means & Method Model* *Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant*			*Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant*			*Means & Methods Model – Phase III Bid Package D See Attachment for Scope Participant*			*Notes (See Sec 3.4)*
Model Elements Utilizing CSI UniFormat™	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	
A SUBSTRUCTURE																			
A10 FOUNDATIONS																			
A1010 Standard Foundations	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*300*	*BPA HHS-03*								
A1010.10 Wall Foundations	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*300*	*BPA HHS-03*								
A1010.30 Column Foundations	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*300*	*BPA HHS-03*								
A1010.90 Standard Foundation Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*300*	*BPA HHS-03*								
A1020 Special Foundations – N/A																			
A1020.10 Driven Piles																			
A1020.15 Bored Piles																			
A1020.20 Caissons																			
A1020.30 Special Foundation Walls																			

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§ 3.3 Model Element Table

Abbreviations:
ABHA - Anderson, Brown & Higley Architects
EDiS - EDiS Company
BP - Bid Package

	Design Intent Model			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package D See Attachment for Scope Participant			Notes (See Sec 3.4)
Model Elements Utilizing CSI UniFormat™	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	
A1020.40 Foundation Anchors																			
A1020.50 Underpinning																			
A1020.60 Raft Foundations																			
A1020.70 Pile Caps																			
A1020.80 Grade Beams																			
A20 SUBGRADE ENCLOSURES– N/A																			
A2010 Walls for Subgrade Enclosures																			
A2010.10 Subgrade Enclosure Wall Construction																			
A2010.20 Subgrade Enclosure Wall Interior Skin																			
A2010.90 Subgrade Enclosure Wall Supplementary Components																			
A40 SLABS-ON-GRADE																			
A4010 Standard Slabs-on-Grade– N/A																			
A4020 Structural Slabs-on-Grade– N/A																			
A4030 Slab Trenches– N/A																			
A4040 Pits and Bases– N/A																			
A4090 Slab-On-Grade Supplementary Components																			
A4090.10 Perimeter Insulation	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*300*	*BPA HHS-03*								
A4090.20 Vapor Retarder	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*300*	*BPA HHS-03*								
A4090.30 Waterproofing																			
A4090.50 Mud Slab																			

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User Notes: (944196914)

§ 3.3 Model Element Table

Abbreviations:
ABHA - Anderson, Brown & Higley Architects
EDiS - EDiS Company
BP - Bid Package

	Design Intent Model			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package D See Attachment for Scope Participant			Notes (See Sec 3.4)
Model Elements Utilizing CSI UniFormat™	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	
A4090.60 Subbase Layer																			
A60 WATER AND GAS MITIGATION																			
A6010 Building Subdrainage																			
A6010.10 Foundation Drainage	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
A6010.20 Underslab Drainage	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
A6020 Off-Gassing Mitigation– N/A																			
A6020.10 Radon Mitigation																			
A6020.50 Methane Mitigation																			
A90 SUBSTRUCTURE RELATED ACTIVITIES																			
A9010 Substructure Excavation																			
A9010.10 Backfill and Compaction - SPCC	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
A9020 Construction Dewatering– N/A																			
A9030 Excavation Support– N/A																			
A9030.10 Anchor Tiebacks																			
A9030.20 Cofferdams																			
A9030.40 Cribbing and Walers																			
A9030.60 Ground Freezing																			
A9030.70 Slurry Walls																			
A9040 Soil Treatment – SPEC– N/A																			
B SHELL																			
B10 SUPERSTRUCTURE																			

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§ 3.3 Model Element Table

Abbreviations:
ABHA - Anderson, Brown & Higley Architects
EDiS - EDiS Company
BP - Bid Package

	Design Intent Model			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package D See Attachment for Scope Participant			Notes (See Sec 3.4)
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
B1010 Floor Construction																			
B1010.10 Floor Structural Frame	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B1010.20 Floor Decks, Slabs, and Toppings	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-03								
B1010.30 Balcony Floor Construction																			
B1010.40 Mezzanine Floor Construction - Reno	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-07								
B1010.50 Ramps	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-03, 07								
B1010.90 Floor Construction Supplementary Components	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B1020 Roof Construction																			
B1020.10 Roof Structural Frame	100	ABHA		200	ABHA		300	ABHA											
B1020.20 Roof Decks, Slabs, and Sheathing	100	ABHA		200	ABHA		300	ABHA											
B1020.30 Canopy Construction	100	ABHA		200	ABHA		300	ABHA											
B1020.90 Roof Construction Supplementary Components	100	ABHA		200	ABHA		300	ABHA											
B1080 Stairs (Reno & New)																			
B1080.10 Stair Construction	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B1080.30 Stair Soffits	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B1080.50 Stair Railings	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B1080.60 Fire Escapes - Reno	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B1080.70 Metal Walkways																			
B1080.80 Ladders	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								

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		Design Intent Model			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package D See Attachment for Scope Participant			Notes (See Sec 3.4)
Model Elements Utilizing CSI UniFormat™		LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
B20	**EXTERIOR VERTICAL ENCLOSURES**																			
B2010	**Exterior Walls**																			
B2010.10	Exterior Wall Veneer	100	ABHA		200	ABHA		300	ABHA											
B2010.20	Exterior Wall Construction	100	ABHA		200	ABHA		300	ABHA											
B2010.30	Exterior Wall Interior Skin	100	ABHA		200	ABHA		300	ABHA											
B2010.40	Fabricated Exterior Wall Assemblies	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B2010.50	Parapets	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
B2010.60	Equipment Screens																			
B2010.80	Exterior Wall Supplementary Components																			
B2010.90	Exterior Wall Opening Supplementary Components	100	ABHA		200	ABHA		300	ABHA											
B2020	**Exterior Windows**																			
B2020.10	Exterior Operating Windows	100	ABHA		200	ABHA		300	ABHA											
B2020.20	Exterior Fixed Windows	100	ABHA		200	ABHA		300	ABHA											
B2020.30	Exterior Window Wall																			
B2020.50	Exterior Special Function Windows	100	ABHA		200	ABHA		300	ABHA											
B2050	**Exterior Doors and Grilles**																			
B2050.10	Exterior Entrance Doors	100	ABHA		200	ABHA		300	ABHA											
B2050.20	Exterior Utility Doors	100	ABHA		200	ABHA		300	ABHA											
B2050.30	Exterior Oversize Doors	100	ABHA		200	ABHA		300	ABHA											
B2050.40	Exterior Special Function Doors	100	ABHA		200	ABHA		300	ABHA											

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Model Elements Utilizing CSI UniFormat™	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	
B2050.60 Exterior Grilles	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2050.70 Exterior Gates	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2050.90 Exterior Door Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2070 Exterior Louvers and Vents																			
B2070.10 Exterior Louvers	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2070.50 Exterior Vents	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2080 Exterior Wall Appurtenances																			
B2080.10 Exterior Fixed Grilles and Screens	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2080.30 Exterior Opening Protection Devices	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2080.50 Exterior Balcony Walls and Railings	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2080.70 Exterior Fabrications	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2080.80 Bird Control Devices	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B2090 Exterior Wall Specialties																			
B30 EXTERIOR HORIZONTAL ENCLOSURES																			
B3010 Roofing																			
B3010.10 Steep Slope Roofing	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B3010.50 Low-Slope Roofing	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B3010.70 Canopy Roofing	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B3010.90 Roofing Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
B3020 Roof Appurtenances																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
B3020.10 Roof Accessories	100	ABHA		200	ABHA		300	ABHA											
B3020.30 Roof Specialties	100	ABHA		200	ABHA		300	ABHA											
B3020.70 Rainwater Management	100	ABHA		200	ABHA		300	ABHA											
B3040 Traffic Bearing Horizontal Enclosures–N/A																			
B3040.10 Traffic Bearing Coatings																			
B3040.30 Horizontal Waterproofing Membrane																			
B3040.50 Wear Surfaces																			
B3040.90 Horizontal Enclosure Supplementary Components																			
B3060 Horizontal Openings																			
B3060.10 Roof Windows and Skylights	100	ABHA		200	ABHA		300	ABHA											
B3060.50 Vents and Hatches	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
B3060.90 Horizontal Opening Supplementary Components	100	ABHA		200	ABHA		300	ABHA											
B3080 Overhead Exterior Enclosures																			
B3080.10 Exterior Ceilings	100	ABHA		200	ABHA		300	ABHA											
B3080.20 Exterior Soffits	100	ABHA		200	ABHA		300	ABHA											
B3080.30 Exterior Bulkheads	100	ABHA		200	ABHA		300	ABHA											
C INTERIORS																			
C10 INTERIOR CONSTRUCTION																			
C1010 Interior Partitions - Replaster																			
C1010.10 Interior Fixed Partitions	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-06					300	BPD HHS-35		

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Model Elements Utilizing CSI UniFormat™		LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
C1010.20	Interior Glazed Partitions	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-06					300	BPD HHS-35		
C1010.40	Interior Demountable Partitions	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-06								
C1010.50	Interior Operable Partitions	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-06					300	BPD HHS-35		
C1010.70	Interior Screens	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-06					300	BPD HHS-35		
C1010.90	Interior Partition Supplementary Components	100	ABHA		200	ABHA		300	ABHA		300	BPA HHS-06					300	BPD HHS-35	300	
C1020	**Interior Windows**																			
C1020.10	Interior Operating Windows	100	ABHA		200	ABHA		300	ABHA											
C1020.20	Interior Fixed Windows	100	ABHA		200	ABHA		300	ABHA											
C1020.50	Interior Special Function Windows	100	ABHA		200	ABHA		300	ABHA											
C1020.90	Interior Window Supplementary Components	100	ABHA		200	ABHA		300	ABHA											
C1030	**Interior Doors**																			
C1030.10	Interior Swinging Doors	100	ABHA		200	ABHA		300	ABHA											
C1030.20	Interior Entrance Doors	100	ABHA		200	ABHA		300	ABHA											
C1030.25	Interior Sliding Doors	100	ABHA		200	ABHA		300	ABHA											
C1030.30	Interior Folding Doors	100	ABHA		200	ABHA		300	ABHA											
C1030.40	Interior Coiling Doors	100	ABHA		200	ABHA		300	ABHA											
C1030.50	Interior Panel Doors	100	ABHA		200	ABHA		300	ABHA											
C1030.70	Interior Special Function Doors	100	ABHA		200	ABHA		300	ABHA											
C1030.80	Interior Access Doors and Panels	100	ABHA		200	ABHA		300	ABHA											

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Model Elements Utilizing CSI UniFormat™			LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
	C1030.90	Interior Door Supplementary Components	100	ABHA		200	ABHA		300	ABHA											
C1040	**Interior Grilles and Gates**																				
	C1040.10	Interior Grilles	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19, 20, 21					
	C1040.50	Interior Gates																			
C1060	**Raised Floor Construction– N/A**																				
	C1060.10	Access Flooring																			
	C1060.30	Platform/Stage Floors																			
C1070	**Suspended Ceiling Construction**																				
	C1070.10	Acoustical Suspended Ceilings	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-08					400	BPD HHS-36		
	C1070.20	Suspended Plaster and Gypsum Board Ceilings	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-08					400	BPD HHS-36		
	C1070.50	Specialty Suspended Ceilings	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-08					400	BPD HHS-36		
	C1070.70	Special Function Suspended Ceilings	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-08					400	BPD HHS-36		
	C1070.90	Ceiling Suspension Components	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-08					400	BPD HHS-36		
C1090	**Interior Specialties**																				
	C1090.10	Interior Railings and Handrails	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05								
	C1090.15	Interior Louvers	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-05		400	BPB HHS-19, 20, 21					
	C1090.20	Information Specialties	100	ABHA		200	ABHA		300	ABHA											
	C1090.25	Compartments and Cubicles	100	ABHA		200	ABHA		300	ABHA											

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
C1090.30 Service Walls	100	ABHA		200	ABHA		300	ABHA											
C1090.35 Wall and Door Protection	100	ABHA		200	ABHA		300	ABHA											
C1090.40 Toilet, Bath, and Laundry Accessories	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-06								
C1090.45 Interior Gas Lighting	100	ABHA		200	ABHA		300	ABHA											
C1090.60 Safety Specialties																			
C1090.70 Storage Specialties																			
C1090.90 Other Interior Specialties																			
C20 INTERIOR FINISHES																			
C2010 Wall Finishes																			
C2010.10 Tile Wall Finish	100	ABHA		200	ABHA		300	ABHA											
C2010.20 Wall Paneling	100	ABHA		200	ABHA		300	ABHA											
C2010.30 Wall Coverings	100	ABHA		200	ABHA		300	ABHA											
C2010.35 Wall Carpeting	100	ABHA		200	ABHA		300	ABHA											
C2010.50 Stone Facing	100	ABHA		200	ABHA		300	ABHA											
C2010.60 Special Wall Surfacing	100	ABHA		200	ABHA		300	ABHA											
C2010.70 Wall Painting and Coating	100	ABHA		200	ABHA		300	ABHA											
C2010.80 Acoustical Wall Treatment	100	ABHA		200	ABHA		300	ABHA											
C2010.90 Wall Finish Supplementary Components	100	ABHA		200	ABHA		300	ABHA											
C2020 Interior Fabrications																			
C2030 Flooring																			

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C2030.10	Flooring Treatment	100	ABHA		200	ABHA		300	ABHA											
C2030.20	Tile Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.30	Specialty Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.40	Masonry Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.45	Wood Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.50	Resilient Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.60	Terrazzo Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.70	Fluid-Applied Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.75	Carpeting	100	ABHA		200	ABHA		300	ABHA											
C2030.80	Athletic Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.85	Entrance Flooring	100	ABHA		200	ABHA		300	ABHA											
C2030.90	Flooring Supplementary Components	100	ABHA		200	ABHA		300	ABHA											
C2040	**Stair Finishes**																			
C2040.20	Tile Stair Finish	100	ABHA		200	ABHA		300	ABHA											
C2040.40	Masonry Stair Finish	100	ABHA		200	ABHA		300	ABHA											
C2040.45	Wood Stair Finish	100	ABHA		200	ABHA		300	ABHA											
C2040.50	Resilient Stair Finish	100	ABHA		200	ABHA		300	ABHA											
C2040.60	Terrazzo Stair Finish	100	ABHA		200	ABHA		300	ABHA											
C2040.75	Carpeted Stair Finish	100	ABHA		200	ABHA		300	ABHA											
C2050	**Ceiling Finishes**																			
C2050.10	Plaster and Gypsum Board Finish	100	ABHA		200	ABHA		300	ABHA											

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C2050.20 Ceiling Paneling	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*400*	*BPA HHS-08*								
C2050.70 Ceiling Painting and Coating																			
C2050.80 Acoustical Ceiling Treatment	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*400*	*BPA HHS-08*								
C2050.90 Ceiling Finish Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*400*	*BPA HHS-08*								
C2090 Interior Finish Schedules– N/A																			
D SERVICES																			
D10 CONVEYING																			
D1010 Vertical Conveying Systems																			
D1010.10 Elevators	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*400*	*BPA HHS-17*		*400*	*BPB HHS-19, 21, 21*					
D1010.20 Lifts	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*		*400*	*BPA HHS-17*		*400*	*BPB HHS-19, 21, 21*					
D1010.30 Escalators– N/A																			
D1010.50 Dumbwaiters– N/A																			
D1010.60 Moving Ramps– N/A																			
D1030 Horizontal Conveying– N/A																			
D1030.10 Moving Walks																			
D1030.30 Turntables																			
D1030.50 Passenger Loading Bridges																			
D1030.70 People Movers																			
D1050 Material Handling– N/A																			
D1050.10 Cranes																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
D1050.20 Hoists																			
D1050.30 Derricks																			
D1050.40 Conveyors																			
D1050.50 Baggage Handling Equipment																			
D1050.60 Chutes																			
D1050.70 Pneumatic Tube Systems																			
D1080 Operable Access Systems– N/A																			
D1080.10 Suspended Scaffolding																			
D1080.20 Rope Climbers																			
D1080.30 Elevating Platforms																			
D1080.40 Powered Scaffolding																			
D1080.50 Building Envelope Access																			
D20 PLUMBING																			
D2010 Domestic Water Distribution																			
D2010.10 Facility Potable-Water Storage Tanks	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2010.20 Domestic Water Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2010.40 Domestic Water Piping	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2010.60 Plumbing Fixtures	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2010.90 Domestic Water Distribution Supplementary Components	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2020 Sanitary Drainage																			
D2020.10 Sanitary Sewerage Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
D2020.30 Sanitary Sewerage Piping	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2020.90 Sanitary Drainage Supplementary Components	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2030 Building Support Plumbing Systems																			
D2030.10 Stormwater Drainage Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2030.20 Stormwater Drainage Piping	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2030.30 Facility Stormwater Drains	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2030.60 Gray Water Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2030.90 Building Support Plumbing System Supplementary Components	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2050 General Service Compressed-Air																			
D2060 Process Support Plumbing Systems																			
D2060.10 Compressed-Air Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2060.20 Vacuum Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D2060.30 Gas Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D30 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)																			
D3010 Facility Fuel Systems																			
D3010.10 Fuel Piping	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
D3010.30 Fuel Pumps	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3010.50 Fuel Storage Tanks	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3020 Heating Systems																			
D3020.10 Heat Generation	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3020.70 Decentralized Heating Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3020.90 Heating System Supplementary Components	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3030 Cooling Systems																			
D3030.10 Central Cooling	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3030.90 Cooling System Supplementary Components	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3050 Facility HVAC Distribution Systems																			
D3050.30 Facility Steam Distribution	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3050.50 HVAC Air Distribution	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3050.90 Facility Distribution Systems Supplementary Components	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
D3060 Ventilation																			
D3060.10 Supply Air	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					

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D3060.20 Return Air	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-19*					
D3060.30 Exhaust Air	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-19*					
D3060.40 Outside Air	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-19*					
D3060.60 Air-to-Air Energy Recovery	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-19*					
D3060.70 HVAC Air Cleaning	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-19*					
D3060.90 Ventilation Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-19*					
D40 FIRE PROTECTION																			
D4010 Fire Suppression																			
D4010.10 Water-Based Fire-Suppression	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-21*					
D4010.50 Fire-Extinguishing	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-21*					
D4010.90 Fire Suppression Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-21*					
D4030 Fire Protection Specialties																			
D4030.10 Fire Protection Cabinets	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-21*					
D4030.30 Fire Extinguishers	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-21*					
D4030.70 Fire Extinguisher Accessories	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-21*					
D50 ELECTRICAL																			
D5010 Facility Power Generation																			

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Model Elements Utilizing CSI UniFormat™	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	
D5010.10 Packaged Generator Assemblies	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*	*If applicable*				
D5010.60 Power Filtering and Conditioning																			
D5010.70 Transfer Switches	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5010.90 Facility Power Generation Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5020 Electrical Service and Distribution																			
D5020.10 Electrical Service	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5020.30 Power Distribution	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5020.70 Facility Grounding	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5020.90 Electrical Service and Distribution Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5030 General Purpose Electrical Power																			
D5030.10 Branch Wiring System	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5030.50 Wiring Devices	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5030.90 General Purpose Electrical Power Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
D5040 Lighting																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
D7030.50 Electronic Personal Protection	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-24					
D7050 Detection and Alarm																			
D7050.10 Fire Detection and Alarm	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-21					
D7070 Electronic Monitoring and Control																			
D7070.10 Electronic Detention Monitoring and Control																			
D7090 Electronic Safety and Security Supplementary Components																			
D7090.10 Supplementary Components																			
D80 INTEGRATED AUTOMATION																			
D8010 Integrated Automation Facility Controls																			
D8010.10 Integrated Automation Control of Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-24					
D8010.20 Integrated Automation Control of Conveying Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-24					
D8010.30 Integrated Automation Control of Fire-Suppression Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-24					
D8010.40 Integrated Automation Control of Plumbing Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-24					

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Model Elements Utilizing CSI UniFormat™		LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
D8010.50	Integrated Automation Control of HVAC Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-24					
D8010.60	Integrated Automation Control of Electrical Systems	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-24					
E EQUIPMENT AND FURNISHINGS																				
E10 EQUIPMENT																				
E1010	**Vehicle and Pedestrian Equipment– N/A**																			
E1010.10	Vehicle Servicing Equipment																			
E1010.30	Interior Parking Control Equipment																			
E1010.50	Loading Dock Equipment																			
E1010.70	Interior Pedestrian Control Equipment																			
E1030	**Commercial Equipment**																			
E1030.10	Mercantile and Service Equipment– N/A																			
E1030.20	Vault Equipment– N/A																			
E1030.25	Teller and Service Equipment– N/A																			
E1030.30	Refrigerated Display Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
E1030.35	Commercial Laundry and Dry Cleaning Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
E1030.40	Maintenance Equipment																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
E1030.50 Hospitality Equipment																			
E1030.55 Unit Kitchens																			
E1030.60 Photographic Processing Equipment																			
E1030.70 Postal, Packaging, and Shipping Equipment																			
E1030.75 Office Equipment																			
E1030.80 Foodservice Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
E1040 Institutional Equipment																			
E1040.10 Educational and Scientific Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-19					
E1040.20 Healthcare Equipment	100																		
E1040.40 Religious Equipment	100																		
E1040.60 Security Equipment	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-20					
E1040.70 Detention Equipment																			
E1060 Residential Equipment– N/A																			
E1060.10 Residential Appliances																			
E1060.50 Retractable Stairs																			
E1060.70 Residential Ceiling Fans																			
E1070 Entertainment and Recreational Equipment																			
E1070.10 Theater and Stage Equipment	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-08								
E1070.20 Musical Equipment																			
E1070.50 Athletic Equipment																			

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E1070.60 Recreational Equipment																			
E1090 Other Equipment																			
E1090.10 Solid Waste Handling Equipment																			
E1090.30 Agricultural Equipment	100	ABHA		200	ABHA		300	ABHA											
E1090.40 Horticultural Equipment	100	ABHA		200	ABHA		300	ABHA											
E1090.60 Decontamination Equipment	100																		
E20 FURNISHINGS																			
E2010 Fixed Furnishings																			
E2010.10 Fixed Art	100	ABHA		200	ABHA		300	ABHA											
E2010.20 Window Treatments	100	ABHA		200	ABHA		300	ABHA											
E2010.30 Casework	100	ABHA		200	ABHA		300	ABHA		400	BPA HHS-11								
E2010.70 Fixed Multiple Seating	100	ABHA		200	ABHA		300	ABHA											
E2010.90 Other Fixed Furnishings	100	ABHA		200	ABHA		300	ABHA											
E2050 Movable Furnishings																			
E2050.10 Movable Art	100	ABHA		200	ABHA		300	ABHA											
E2050.30 Furniture	100	ABHA		200	ABHA		300	ABHA											
E2050.40 Accessories	100	ABHA		200	ABHA		300	ABHA											
E2050.60 Movable Multiple Seating	100	ABHA		200	ABHA		300	ABHA											
E2050.90 Other Movable Furnishings	100	ABHA		200	ABHA		300	ABHA											
F SPECIAL CONSTRUCTION AND DEMOLITION																			

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F10 SPECIAL CONSTRUCTION																			
F1010 Integrated Construction																			
F1010.10 Building Modules	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
F1010.50 Manufactured/Fabricated Rooms	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
F1010.70 Modular Mezzanines	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
F1020 Special Structures– N/A																			
F1020.10 Fabric Structures																			
F1020.20 Space Frames																			
F1020.30 Geodesic Structures																			
F1020.40 Manufacturer-Engineered Structures																			
F1020.60 Manufactured Canopies																			
F1020.65 Rammed Earth Construction																			
F1020.70 Towers																			
F1030 Special Function Construction																			
F1030.10 Sound and Vibration Control	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
F1030.30 Seismic Control	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*											
F1030.50 Radiation Protection																			
F1050 Special Facility Components																			
F1050.10 Pools																			
F1050.20 Interior Fountains																			
F1050.30 Interior Water Features																			

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Model Elements Utilizing CSI UniFormat™		*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	
F1050.40	*Aquariums*																			
F1050.50	*Amusement Park Structures and Equipment*																			
F1050.60	*Ice Rinks*																			
F1050.70	*Animal Containment*																			
F1060	***Athletic and Recreational Special Construction***																			
F1060.10	*Indoor Soccer Boards*																			
F1060.20	*Safety Netting*																			
F1060.30	*Arena Football Boards*																			
F1060.40	*Floor Sockets*																			
F1060.50	*Athletic and Recreational Court Walls*																			
F1060.60	*Demountable Athletic Surfaces*																			
F1080	***Special Instrumentation***																			
F1080.10	*Stress Instrumentation*																			
F1080.20	*Seismic Instrumentation*																			
F1080.40	*Meteorological Instrumentation*																			
F1080.60	*Earth Movement Monitoring*																			
F20	***FACILITY REMEDIATION***																			
F2010	***Hazardous Materials Remediation***																			
F2010.10	*Transportation and Disposal of Hazardous Materials*																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
F2010.20 Asbestos Remediation																			
F2010.30 Lead Remediation																			
F2010.40 Polychlorinate Biphenyl Remediation																			
F2010.50 Mold Remediation																			
F30 DEMOLITION																			
F3010 Structure Demolition																			
F3010.10 Building Demolition	100	ABHA		200	ABHA		300	ABHA											
F3010.30 Tower Demolition	100	ABHA		200	ABHA		300	ABHA											
F3010.50 Bridge Demolition	100	ABHA		200	ABHA		300	ABHA											
F3010.70 Dam Demolition	100	ABHA		200	ABHA		300	ABHA											
F3030 Selective Demolition																			
F3030.10 Selective Building Demolition	100	ABHA		200	ABHA		300	ABHA											
F3030.30 Selective Interior Demolition	100	ABHA		200	ABHA		300	ABHA											
F3030.50 Selective Bridge Demolition	100	ABHA		200	ABHA		300	ABHA											
F3030.70 Selective Historic Demolition	100	ABHA		200	ABHA		300	ABHA											
F3050 Structure Moving																			
F3050.10 Structure Relocation	100	ABHA		200	ABHA		300	ABHA											
F3050.30 Structure Raising	100	ABHA		200	ABHA		300	ABHA											
G SITEWORK– N/A																			
G10 SITE PREPARATION																			
G1010 Site Clearing																			

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G1010.10 Clearing and Grubbing																			
G1010.30 Tree and Shrub Removal and Trimming																			
G1010.50 Earth Stripping and Stockpiling																			
G1020 Site Elements Demolition																			
G1020.10 Utility Demolition																			
G1020.30 Infrastructure Demolition																			
G1020.50 Selective Site Demolition																			
G1030 Site Element Relocations																			
G1030.10 Utility Relocation																			
G1050 Site Remediation																			
G1050.10 Physical Decontamination																			
G1050.15 Chemical Decontamination																			
G1050.20 Thermal Decontamination																			
G1050.25 Biological Decontamination																			
G1050.30 Remediation Soil Stabilization																			
G1050.40 Site Containment																			
G1050.45 Sinkhole Remediation																			
G1050.50 Hazardous Waste Drum Handling																			
G1050.60 Contaminated Site Material Removal																			
G1050.80 Water Remediation																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
G1070 Site Earthwork																			
G1070.10 Grading																			
G1070.20 Excavation and Fill																			
G1070.30 Embankments																			
G1070.35 Erosion and Sedimentation Controls																			
G1070.40 Soil Stabilization																			
G1070.45 Rock Stabilization																			
G1070.50 Soil Reinforcement																			
G1070.55 Slope Protection																			
G1070.60 Gabions																			
G1070.65 Riprap																			
G1070.70 Wetlands																			
G1070.80 Earth Dams																			
G1070.90 Site Soil Treatment																			
G20 SITE IMPROVEMENTS– N/A																			
G2010 Roadways																			
G2010.10 Roadway Pavement																			
G2010.20 Roadway Curbs and Gutters																			
G2010.40 Roadway Appurtenances																			
G2010.70 Roadway Lighting																			
G2010.80 Vehicle Fare Collection																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
G2050 Athletic, Recreational, and Playfield Areas																			
G2050.10 Athletic Areas																			
G2050.30 Recreational Areas																			
G2050.50 Playfield Areas																			
G2060 Site Development																			
G2060.10 Exterior Fountains																			
G2060.20 Fences and Gates																			
G2060.25 Site Furnishings																			
G2060.30 Exterior Signage																			
G2060.35 Flagpoles																			
G2060.40 Covers and Shelters																			
G2060.45 Exterior Gas Lighting																			
G2060.50 Site Equipment																			
G2060.60 Retaining Walls																			
G2060.70 Site Bridges																			
G2060.80 Site Screening Devices																			
G2060.85 Site Specialties																			
G2080 Landscaping																			
G2080.10 Planting Irrigation																			
G2080.20 Turf and Grasses																			
G2080.30 Plants																			

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G2080.50 Planting Accessories																			
G2080.70 Landscape Lighting																			
G2080.80 Landscaping Activities																			
G30 LIQUID AND GAS SITE UTILITIES– N/A																			
G3010 Water Utilities																			
G3010.10 Site Domestic Water Distribution																			
G3010.30 Site Fire Protection Water Distribution																			
G3010.50 Site Irrigation Water Distribution																			
G3020 Sanitary Sewerage Utilities																			
G3020.10 Sanitary Sewerage Utility Connection																			
G3020.20 Sanitary Sewerage Piping																			
G3020.40 Utility Septic Tanks																			
G3020.50 Sanitary Sewerage Structures																			
G3020.60 Sanitary Sewerage Lagoons																			
G3030 Storm Drainage Utilities																			
G3030.10 Storm Drainage Utility Connection																			
G3030.20 Storm Drainage Piping	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHA-19*					
G3030.30 Culverts																			
G3030.40 Site Storm Water Drains	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHA-19*					
G3030.50 Storm Drainage Pumps																			

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	G3030.60	Site Subdrainage																			
	G3030.70	Storm Drainage Ponds and Reservoirs																			
G3050	**Site Energy Distribution**																				
	G3050.10	Site Hydronic Heating Distribution																			
	G3050.20	Site Steam Energy Distribution																			
	G3050.40	Site Hydronic Cooling Distribution																			
G3060	**Site Fuel Distribution**																				
	G3060.10	Site Gas Distribution																			
	G3060.20	Site Fuel-Oil Distribution																			
	G3060.30	Site Gasoline Distribution																			
	G3060.40	Site Diesel Fuel Distribution																			
	G3060.60	Site Aviation Fuel Distribution																			
G3090	**Liquid and Gas Site Utilities Supplementary Components**																				
	G3090.10	Supplementary Components																			
G40	**ELECTRICAL SITE IMPROVEMENTS**																				
G4010	**Site Electric Distribution Systems**																				
	G4010.10	Electrical Utility Services	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-20					
	G4010.20	Electric Transmission and Distribution	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-20					
	G4010.30	Electrical Substations	100	ABHA		200	ABHA		300	ABHA					400	BPB HHS-20					

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Model Elements Utilizing CSI UniFormat™	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	*LOD*	*MEA*	*Notes*	
G4010.40 Electrical Transformers	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G4010.50 Electrical Switchgear and Protection Devices	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G4010.70 Site Grounding	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G4010.90 Electrical Distribution System Instrumentation and Controls	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G4050 Site Lighting																			
G4050.10 Area Lighting	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G4050.20 Flood Lighting	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G4050.50 Building Illumination	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G4050.90 Exterior Lighting Supplementary Components	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G50 SITE COMMUNICATIONS																			
G5010 Site Communications Systems																			
G5010.10 Site Communications Structures	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G5010.30 Site Communications Distribution	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G5010.50 Wireless Communications Distribution	*100*	*ABHA*		*200*	*ABHA*		*300*	*ABHA*					*400*	*BPB HHS-20*					
G90 MISCELLANEOUS SITE CONSTRUCTION																			
G9010 Tunnels																			
G9010.10 Vehicular Tunnels																			
G9010.20 Pedestrian Tunnels																			
G9010.40 Service Tunnels																			

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SECTION 014500 - QUALITY CONTROL

1. DESCRIPTION

A. 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

A. 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.

B. Retest Responsibility: Where results of inspections or test do not indicate compliance with Contract Documents, retests are the Contractor's responsibility.

C. 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.

D. 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.

E. Qualifications for Service Agencies: Contractor shall engage only inspection and test service agencies which are pre-qualified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories.

F. 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.

G. 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.

H. 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."

I The 2013 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 015113 - TEMPORARY ELECTRICITY

1. GENERAL

A. RELATED WORK SPECIFIED ELSEWHERE

1. Electrical Basic Materials and Methods, Division 26.

B. DESCRIPTION OF SYSTEM

1. Power Source

a. Suppliers: Delaware Electric Cooperative

b. The Construction Manager shall provide 277/480 volt, three phase, 60 cycle power service to the site from the existing service.

c. The Construction Manager will make all arrangements for bringing the power supply to the site and for installation of appropriate temporary transformers to provide for the power supply in 1.B.1.b, above.

d. The source will be adequate to service temporary electrical needs of the proposed construction.

2. Electrical Service

a. Contractor will be responsible to pay for all costs associated with providing electrical service from the power source to their respective site office, temporary storage facilities or temporary construction buildings as appropriate.

b. Prior to issuance of the Notice to Proceed for the electrical contract, the Construction Manager will be responsible for providing temporary electrical service as provided in 1.B.2.c, below. After issuance of the Notice to Proceed for the electrical contract, the Electrical Contractor shall become responsible for maintaining all electrical power supply and service facilities installed by the Construction Manager. The Electrical Contractor shall also, from that date forward, be responsible for providing and maintaining temporary electrical service to the site as provided in 1.B.2.c, below.

c. The Construction Manager or Electrical Contractor, as provided in 1.B.2.b, above, shall install temporary electric service for items below, throughout the construction period, such that power can be secured at any desired point with no more than a 60 foot extension:

(1) Power Centers for miscellaneous tools and equipment used in the construction work shall be provided with a minimum of four 20-amp, 120 volt grounding type outlets. Each outlet shall be provided with ground fault detecting circuit breaker protection.

(2) Adequate lighting for safe working conditions shall be provided and maintained on a 24 hour per day basis throughout the building, tunnels, and stairways per OSHA requirements. Each lamp must be rated at least 100 watts. Voltage of each socket must be at least 110 volts.

(3) Power for testing and checking equipment must be supplied.

3. Capacity

a. All electrical power supply and service lines installed shall be of adequate capacity for construction use by all trades during the construction period at the locations necessary.

b. The Electrical Contractor shall notify the Power Company if unusually heavy loads, such as welding units, are anticipated.

4. Power Costs

a. The Construction Manager will pay all costs of temporary electrical power used during construction.

b. The Owner will pay all costs of power used in the permanent wiring.

C. REQUIREMENTS AND REGULATORY AGENCIES

1. The Electrical Contractor will obtain permits as required by local governmental authorities.

2. The temporary electrical service shall comply with National Electrical Code, Latest Edition and applicable local codes and utility regulations.

D. USE OF PERMANENT SYSTEM

1. The Electrical Contractor shall regulate any part of the permanent electrical system which is used for construction purposes to prevent interference with safety and orderly progress of the Work.

2. Contractors shall leave permanent electrical services in a condition as good as

new and clean.

2. PRODUCTS

A. MATERIALS

1. General

a. The materials may be new or used, but must be adequate in capacity for the purposes intended and must not create unsafe conditions or violate the requirements of applicable codes.

2. Conductors

a. Use wire, cable, or busses of appropriate type, sized in accordance with the National Electrical Code for the applied loads.

b. Use only UL labeled wire and devices.

B. EQUIPMENT

1. Provide appropriate enclosure for the environment in which used in compliance with NEMA standards.

3. EXECUTION

A. GENERAL

1. Install all work with a neat and orderly appearance.

2. Make structurally sound throughout.

3. Maintain to give continuous service and to provide safe working conditions.

4. Modify temporary power and light installation as job progress requires.

B. INSTALLATION

1. Locate so that interference with storage areas, traffic areas and work under other Contracts is avoided.

C. REMOVAL

1. Remove all temporary equipment and materials completely upon completion of construction.

2. Repair all damage caused by the installation and restore to satisfactory condition.

END OF SECTION

SECTION 015123 - TEMPORARY HEATING, COOLING AND VENTILATING

1. GENERAL

A. RELATED REQUIREMENTS SPECIFIED ELSEWHERE

1. Temporary Electric: Section 015113

2. Temporary Facilities: Section 015200

3. Heating Requirements for Cold Weather Installation and Protection of Materials: Respective specification section for each item of work.

B. DEFINITIONS

1. Temporary Enclosures: Sufficient preliminary enclosures of an area of structure, or of an entire building, to prevent entrance or infiltration of rain water, wind or other elements and which will prevent undue heat loss from within enclosed area.

2. Permanent Enclosure: Stage of construction at which all moisture and weather protection elements of construction have been installed in accordance with Contract Documents, either for a portion of structure, or for an entire building.

C. DESCRIPTION OF SYSTEM

1. Prior to the building or portion of building being permanently enclosed, the contractor shall provide temporary heat and ventilation and weather protection necessary for its work, as described below. After permanent enclosure, the Construction Manager will arrange for and coordinate temporary heat and ventilation in enclosed areas required to:

a. Facilitate progress of Work.

b. Protect Work and products against dampness and cold.

c. Prevent moisture condensation on surfaces.

d. Provide suitable ambient temperatures and humidity levels for installation and curing of materials.

e. Provide adequate ventilation to meet health regulations for safe working environment.

2. Temperatures Required

   a. Generally, 24 hours a day: Minimum of 40 degrees F.

   b. 24 hours a day during placing, setting and curing of cementitious materials: As required by specification section for each product.

   c. 24 hours a day, seven days prior to, and during, placing of interior finishes: woodwork, resilient floors, painting and finishing: As required by specification section for each product.

   d. 24 hours a day after application of finishes, and until Substantial Completion: Minimum of 50 degrees F.

3. Ventilation Required:

   a. Contractors shall prevent hazardous accumulations of dusts, fumes, mists, vapors or gases in areas occupied during construction.

      (1) Provide local exhaust ventilation to prevent harmful dispersal of hazardous substances into atmosphere of occupied areas.

      (2) Dispose of exhaust materials in manner that will not result in harmful dispersal of hazardous substances into atmosphere of occupied areas.

      (3) Continuously ventilate storage spaces containing hazardous or volatile materials.

      (4) Contractor must provide and use equipment which is furnished with Exhaust Purifiers/Scribbers or is electrically power driven when any such equipment produces airborne containments and will be used in an enclosed building.

      (5) The Contractor shall verify air quality by the use of air monitoring equipment and document the verified air quality on the daily report. The monitoring equipment shall, at a minimum, be designed with an auditory alarm and shall provide continuous monitoring of those four gasses, Oxygen, Hydrogen Sulfide, Carbon Monoxide and Combustible gasses.

4. Contractors shall provide adequate ventilation for:

   a. Curing installed materials.

   b. Dispersal of humidity.

c. Temporary sanitary facilities.

5. Duration of Operations:

a. For Personnel:

(1) At all times personnel occupy an area subject to hazardous accumulations of harmful elements.

(2) Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.

b. For curing installed materials: As required by specification section for respective materials.

c. For humidity dispersal: Continuously ventilate to provide suitable ambient conditions for work.

d. The Contractor shall maintain supervision and operation of temporary heating and ventilating equipment in order to:

(1) Enforce conformance with applicable codes and standards.

(2) Enforce safe practices.

(3) Prevent abuse of services.

D. COSTS OF INSTALLATION AND OPERATION

1. The Contractor shall be responsible for all installation and operating costs for any heat and ventilation as required in this section until the permanent HVAC system is in operation.

2. After the permanent HVAC system is operational, the Owner will pay the costs of fuel for temporary heat and ventilation. The Contractor will pay the costs for maintaining the system until final acceptance by the Owner.

3. The Contractor shall be responsible for all installation and operating costs for any heat required to supplement that which is to be supplied by the Construction Manager in 1.C.1, above.

E. REQUIREMENTS OF REGULATORY AGENCIES

1. The Construction Manager will obtain and pay for permits as required by

governing authorities for those activities required by this Section.

2. Contractor shall comply with Federal, State and local codes, and utility company regulations.

2. PRODUCTS

A. MATERIALS

1. General

a. Materials may be new or used, but must be adequate for purposes intended and must not create unsafe conditions nor violate requirements of applicable codes.

B. EQUIPMENT

1. Standard products, meeting code requirements.

2. Provide required facilities, including piping, wiring and controls.

3. Portable Heater: Standard Units, meeting code requirements.

a. Safety Controls against explosion, overheating, and carbon monoxide build up.

b. Vent direct-fired units to outside.

c. Provide adequate combustion air.

4. Oil-Fired heaters will not be allowed.

3. EXECUTION

A. GENERAL

1. Comply with applicable sections of Division 15 - Mechanical.

2. Install work in neat and orderly manner.

3. Make structurally, mechanically and electrically sound throughout.

4. Maintain to give safe, continuous service at required times and to provide safe working conditions.

5. Modify and extend system as work progress requires.

B. INSTALLATION

1. Locate units to provide equitable distribution of heat and air movements.

2. Locate to avoid interference with, or hazards to:

   a. Work or movement of personnel.

   b. Traffic areas.

   c. Materials handling.

   d. Storage areas.

   e. Work of other Contractors.

   f. Finishes.

C. OPERATION OF PERMANENT EQUIPMENT

1. The Construction Manager will coordinate with Contractor.

2. The Contractor will place permanent HVAC system in operation only upon written authorization by the Construction Manager.

3. Before operating the permanent HVAC equipment, the Contractor shall confirm to the Construction Manager that:

   a. Inspection has been made by proper authorities.

   b. Systems, equipment piping, strainers, filters and associated operating items are sufficiently complete, cleaned, and ready for operation.

   c. Controls and safety devices are complete and tested, or adequate temporary controls are provided.

   d. Before operating the permanent HVAC equipment, the Contractor shall install temporary filters:

      (1) For air handling units.

      (2) For permanent ducts.

D. REMOVAL

1. The Contractor shall completely remove temporary materials and equipment when no longer required, or on completion of construction.

2. The Contractor shall clean and repair damage caused by temporary installation, and restore equipment to specified or original condition.

3. The Contractor shall remove temporary filters and install new filters, or clean permanent filters, in the permanent HVAC system prior to final acceptance by the Owner.

END OF SECTION

SECTION 015200 - CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

1. GENERAL

A. 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.

B. RELATED WORK SPECIFIED ELSEWHERE

1. Temporary Electric: Section 015113.

2. FACILITIES

A. 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 or 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.

B. 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: Contractor 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. Contractor shall provide and maintain all hoses, piping and valves as required for obtaining construction water from taps provided by the Construction Manager.

C. 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.

D. 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.

E. FIRE PROTECTION

1. The Carpentry & General Work Contractor 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 10lb, Multi-Purpose (ABC) dry chemical, UL labeled, with a rating of 3a:40bc.

F. ACCESS ROADS AND PARKING AREAS

1. The Utility & Sitework Contractor will provide and maintain access roads on the site.

2. Parking for Contractor's personnel on the project site will be at locations determined by the Owner and Construction Manager. Parking at locations other than designated areas is PROHIBITED.

G. 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, whatsoever is the most stringent.

H. FIRST AID STATION

1. 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.

I. SECURITY

1. The Construction Manager will provide the following security measures at the site: security lighting will be provided.

2. All other 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.

J. 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.

K. 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.

L. PROJECT SIGN

1. The Construction Manager will provide a Project Sign naming the major participants, as determined by the Owner.

M. TRASH DISPOSAL

1. Each Contractor shall be responsible for daily 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. Contractors will not use the owner's dumpsters.

N. HOISTING

1. Contractor shall provide its own materials hoists and cranes. No personnel hoist will be provided.

O. 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.

P. SAFETY BARRICADES AND RAILINGS

1. The Contractor creating the hazard shall provide barricades **and protective barriers** around stairs, shafts and cut openings in floors and roofs, and edges of floors and roofs. The methods and materials used in barricading shall be in accordance with OSHA and local code regulations. Barricades and protective barriers will be installed immediately after the installation of the floor slab on any level or part of a level on the Building. When a warning barricade is used to prohibit employees from entering a restricted work area. The "warning barricade" shall meet the requirements of CFR 1926.502 (f)(2). The supported rope, wire, or chain shall be flagged at not more than 6-foot (1.8 m) intervals with high-visibility material and maintain between 34 and 39 inches above the walking/working surface; Warning signs and tags shall be used in accordance with Subpart G of CFR OSHA Construction Industry Regulations.

2. After the barricades and protective barriers are no longer needed, the Structural Contractor 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, whatsoever is most stringent. The intent is to leave no floor penetration or perimeter opening in an unsafe condition.

Q. 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.

R. TEMPORARY BUILDING ENCLOSURES

1. The Construction Manager will equip all temporary exterior doors of the building with self-closing hardware and padlocks.

2. All other temporary enclosures and protection shall be provided by the Contractor requiring the protection.

3. Temporary enclosures required due to late delivery of materials or untimely installation of work shall be the responsibility of the Contractor responsible for the delay.

S. TEMPORARY POWER AND LIGHTING

1. Contractor shall provide all extension cords and outlets as required for obtaining electric power from power centers. Refer to Section 015113 - TEMPORARY ELECTRIC.

2. Contractor shall provide its own additional temporary lighting of sufficient lighting levels to properly install his work.

T. TEMPORARY HEAT

1. Contractor shall provide temporary heat as required for its operations. Once a building has reached the "Permanent Enclosure" stage, temporary heat will be provided as specified in Section 015123 - TEMPORARY HEAT AND VENTILATION.

2. Equipment and methods of temporary heating shall be reported to the Construction Manager.

U. PROTECTION OF ADJACENT MATERIALS

1. Contractor shall protect adjacent materials and finishes from damage as a result of its work.

V. 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.M above. Clean up shall be on a continual basis to ensure that building, grounds and public properties are maintained free from accumulations of waste materials and trash.

2. The Contractor will limit use of and ensure that all materials, including waste, that are combustible or flammable will be removed from the building continually, as work progresses, **and at a minimum** at the end of each work day. All trash which is potentially edible or may attract rodents or insects 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.

W. 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 adequate dust protection.

X. 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.

Y. OTHER

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

A. 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 016200 - MATERIAL AND EQUIPMENT

1. GENERAL CONDITIONS

A. 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.

B. Where work is to be executed under Separate Prime Contracts, the provisions of this Section apply to each Contract.

2. REQUIREMENTS INCLUDED

A. 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.

B. 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.

C. Contractor shall not use materials or equipment for any purpose other than that for which it is designated or is specified.

D. Materials removed form existing structures shall not be reused in the completed work unless specifically indicated or specified.

E. 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

A. 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.

B. 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

A. 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.

B. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

5. STORAGE AND PROTECTION

A. 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.

B. 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.

C. 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.

D. 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.

E. 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. <u>SUBSTITUTIONS AND PRODUCT OPTIONS</u>

A. 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.

B. 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 6.C, below.

4. For Products specified by naming only one Product and manufacturer, there is no option; and Contractor shall provide the precise Product specified.

C. 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:

a. Comparison of the qualities of the proposed substitution with that specified.

b. Changes required in other elements of the Work because of the substitution.

c. Effect on the construction schedule.

d. Cost data comparing the proposed substitution with the Product specified.

e. Any required license fees or royalties.

f. 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:

a. has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified;

b. will provide the same warranties or bonds for the substitution as for the Product specified;

c. 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

d. waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

D. 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 017329 - CUTTING AND PATCHING

1. GENERAL

A. 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.

B. Refer to Other Sections of these specifications for specific cutting and patching requirements and limitations applicable to individual units of work.

C. 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.

D. 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.

E. 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

F. 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

A. 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

A. 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.

B. Temporary Support: To prevent failure provide temporary support of work to be cut.

C. 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.

D. 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.

E. 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 017700 – CONTRACT CLOSEOUT

1. DESCRIPTION OF REQUIREMENTS

A. 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.

2. PROCEDURES AT SUBSTANTIAL COMPLETION

A. 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.

B. 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.

C. 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

A. 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

A. 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.

B. Installation, Operation and 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.

C. 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.

D. AIA Documents: Contractors shall provide the following AIA documents with their final payment application submission:
- AIA G732, Application for Payment for 100% Complete
- AIA G732, Final Application for Payment for Retainage
- AIA G704-CMA, Certificate of Substantial Completion – 4 originals
- AIA G706, Affidavit of Payment of Debts & Claims
- AIA G706A, Affidavit of Release of Liens
- AIA G707, Consent of Surety

E. Release of Liens: Contractors shall provide the following release of liens with their final payment application submission:

- Prime Contractor's Release of Liens
- Subcontractors' & Suppliers' Release of Liens (major subs and suppliers)

5. GENERAL CLOSE OUT REQUIREMENTS

A. 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.
4. Door hardware

6. FINAL CLEANING

A. At the time of project close out Contractor shall clean or re-clean 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 9123
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify and document that functional performance is in accordance with the Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
   2. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   3. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion

C. The Commissioning Authority is employed by Owner.

1.02 SCOPE OF COMMISSIONING

A. The following are to be commissioned:

B. Building envelope.

C. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 RELATED REQUIREMENTS

A. Section 01 7800 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

B. Section 04 0125 - Masonry Cleaning

C. Section 04 0126 - Masonry Restoration

D. Section 07 9200 - Joint Sealants

1.04 REFERENCE STANDARDS

A. PECI (Samples) - Sample Forms for Prefunctional Checklists and Functional Performance Tests; Portland Energy Conservation, Inc.; located at http://www.peci.org/library/mcpgs.htm; current edition.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority, unless they require review by Architect; in that case, submit to Architect first.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable electronic format, Microsoft Word 2010 preferred.

5. As soon as possible after submittals made to Architect are approved, submit copy of approved submittal to the Commissioning Authority.

B. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the material as soon as the material is delivered.

C. Product Data: If submittals to Architect do not include the following, submit copies as soon as possible:
1. Manufacturer's product data, cut sheets, and shop drawings.
2. Manufacturer's installation instructions.
3. Factory test reports.
4. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.

D. Completed Prefunctional Checklists.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.

B. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

A. Commissioning Authority will prepare the Commissioning Plan.
1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:
1. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
2. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.02 DOCUMENTATION IDENTIFICATION SYSTEM

A. Give each submitted form or report a unique identification; use the following scheme.

B. Type of Document: Use the following prefixes:
1. Functional Test Procedure: FTP-.
2. Functional Test Report: FTR-.

C. Component Number: Assign numbers sequentially, using 1, 2, or 3 digits as required to accommodate the number of units in the system.

D. Test, Revision, or Submittal Number: Number each successive iteration sequentially, starting with 1.

E. Example: PC-2320-001.2 would be the Prefunctional Checklist for equipment item 1 in the HVAC piping system, probably a pump; this is the second, revised submittal of this checklist.

3.03 STARTUP PLANS AND REPORTS

A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.

B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.

C. Submit directly to the Commissioning Authority.

3.04 PREFUNCTIONAL CHECKLISTS

A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
   1. No sampling of identical or near-identical items is allowed.
   2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
   3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
      a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
      b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
      c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
      d. Serial number of installed unit.
      e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer’s start-up checklist items and minor testing.
      f. Sensor and actuator calibration information.
   4. Samples of Prefunctional Checklist forms that indicate anticipated level of detail can be found at http://www.peci.org/library/mcpgs.htm.

B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.
   1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
   2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.

3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
4. If any Checklist line item is not relevant, record reasons on the form.
5. Contractor may independently perform startup inspections and/or tests, at his option.
6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
7. Submit completed Checklists to Commissioning Authority within two days of completion.

C. Commissioning Authority is responsible for furnishing the Prefunctional Checklists to Contractor.
1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in the Contract Documents.
2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in the Contract Documents or not.
4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Authority Witnessing: Required for:
1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.

3.05 FUNCTIONAL TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.

C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents or does not perform properly.
2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.
3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after

notification of defect, including provision for testing sample installations prior to replacement of all items.

4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:
1. Some test procedures are included in the Contract Documents; where Functional Test procedures are not included in the Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.
2. Examples of Functional Testing:
a. Test for sealant adhesive and cohesive failure.
b. Test windows for resistance to water penetration.
3. Samples of Functional Test forms that indicate anticipated level of detail can be found at http://www.peci.org/library/mcpgs.htm.

3.06 TEST PROCEDURES - GENERAL

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
2. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.

D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

3.07 OPERATION AND MAINTENANCE MANUALS

A. See Section 01 7800 - Closeout Submittals for additional requirements.

B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.

C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.

D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

3.08 FUNCTIONAL TESTS

A.

END OF SECTION

SECTION 01 9125
EXTERIOR ENCLOSURE COMMISSIONING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes exterior enclosure commissioning procedures, including exterior enclosure, and roofing construction that protects climate-controlled interior spaces from unconditioned spaces and the exterior environment, as follows:
   1. Below-grade construction including foundations, basements, and slab-on-grade that functions as part of the exterior enclosure system but excluding structural systems and components.
   2. Superstructure floor and roof construction that functions as part of the exterior enclosure system.
   3. Exterior enclosure construction, above grade, including exterior opaque walls, windows, and doors including sheathing, framing, and insulation, and interior finish materials attached to the exterior wall.
   4. Roofing, including roofing system, roofing insulation, and skylights, hatches, and other roof openings.

1.02 RELATED SECTIONS:

A. Division 01 Section "General Commissioning Requirements" for general requirements for commissioning including definitions, commissioning team membership, Owner's responsibilities, Contractor's responsibilities, and Commissioning Authority's responsibilities.

B. Division 03 through 14 Sections for facility exterior enclosure commissioning requirements specific to the Work of each Section.

1.03 ALLOWANCES

A. Commissioning testing and inspection costs are included in the Commissioning Testing Allowance in Division 01 Section "Allowances" Division 1 Section "Allowances"

1.04 UNIT PRICE

A. Commissioning Testing Allowance may be adjusted up or down by the "Commissioning Testing Man-Hour" unit prices in Division 01 Section "Unit Prices" when actual man hours are computed at the end of commissioning testing.

1.05 CONTRACTOR'S RESPONSIBILITIES

A. Attend construction-phase coordination meetings.

B. Provide schedule of field quality control tests and inspections required by the Contract Documents to Commissioning Authority.
   1. Update schedule biweekly throughout the construction period.

C. Submit field quality control testing and inspection reports on exterior enclosure construction to the Commissioning Authority.

D. Submit operation and maintenance data for systems, subsystems, and components to the Commissioning Authority.

E. Participate in testing-procedures meetings.

F. Participate in testing of installed systems, subsystems, and construction.

G. Provide test data, inspection reports, and certificates to Commissioning Authority.

H. Participate in maintenance orientation and inspection.

I. Participate in operation and maintenance training sessions.

J. Participate in final review at acceptance meeting.

K. Provide input for final commissioning documentation.

1.06 COMMISSIONING AUTHORITY'S RESPONSIBILITIES

A. Provide Project-specific construction checklists and commissioning process test procedures.

B. Witness systems, assemblies, equipment, and component startup.

C. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning process report.

1.07 COMMISSIONING DOCUMENTATION

A. Provide the following information to Commissioning Authority for inclusion in the Commissioning Plan:
   1. Submittals, information for systems manuals, and other required documents and reports.
   2. Identification of installed exterior enclosure components, assemblies, systems, and equipment, including design changes that occurred during the construction phase.
   3. Certificate of completion, certifying that exterior enclosure assemblies, systems, equipment, and associated controls are complete and ready for testing.
   4. Test and inspection reports and certificates.
   5. Corrective action documents.

1.08 PRECONSTRUCTION TESTING

A. Preconstruction Mockup Testing:
   1. Provide adhesion testing of sealant.
   2. Provide stain testing of sealant.
   3. Provide water penetration resistance testing of windows.
   4. Provide mortar pointing samples for brick work.

1.09 COMMISSIONING SUBMITTALS

A. Submit commissioning submittals to Commissioning Authority. Submittals requiring Architect’s action will be returned to Construction Manager, through Architect.

1.10 QUALITY ASSURANCE

A. Quality Assurance and Control: Specific commissioning quality-assurance and-control requirements for individual construction activities are specified in the Sections that specify those activities. Specified commissioning tests, inspections, and related actions do not limit Contractor's other quality-assurance and-control procedures that facilitate compliance with the Contract Document requirements.

B. Preconstruction Commissioning Conference: Commissioning Authority will schedule a preconstruction commissioning conference before construction of the exterior enclosure starts, at a time convenient to Owner, Construction Manager, Contractor, and Architect, but no later than 15 days after execution of the Agreement with the Contractor. Allow for the conference to be held at Project site or another convenient location. The Commissioning Authority will conduct the meeting to review commissioning responsibilities and personnel assignments.
   1. Attendees: Authorized representatives of Owner, Construction Manager, Commissioning Authority, Architect and consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to commissioning.

2. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Commissioning plan
   b. Tentative construction schedule.
   c. Phasing.
   d. Critical work sequencing and long-lead items.
   e. Designation of key personnel and their duties.
   f. Procedures for testing and inspecting.
   g. Submittal procedures.
   h. LEED requirements.
   i. Preparation of Record Documents.
   j. Owner's occupancy requirements.
   k. Security.
3. Minutes: Record and distribute meeting minutes.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 VERIFICATION

A. Certify that building exterior enclosure systems, subsystems, and construction have been completed according to the Contract Documents.

B. Commissioning Authority will witness and document field quality-control tests and inspections.

C. Verify that field quality control testing of building exterior enclosure has been completed and approved, that discrepancies have been corrected, and corrective work approved.
   1. Annotate checklist or data sheet when a deficiency is observed.

D. Deferred Testing:
   1. If tests cannot be completed because of a deficiency outside the scope of the Building Exterior Enclosure, the deficiency shall be documented and reported to Owner. Deficiencies shall be resolved and corrected by Contractor and tests rescheduled.
   2. If the testing plan indicates specific seasonal testing, appropriate initial performance tests shall be completed and documented and additional tests scheduled.

E. Testing Reports:
   1. Reports shall include measured data, data sheets, and a comprehensive summary describing the building exterior enclosure systems at the time of testing.
   2. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.

3.02 BUILDING SYSTEM COMPONENT OR FUNCTION TO BE TESTED:

A. Masonry Repointing:

B. Limestone Repair:

C. Masonry Cleaning:

D. Waterproof Coating:

E. Sheet Waterproofing.
   1. Verify existing conditions before starting work.
   2. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.

3. Verify that items that penetrate surfaces to receive waterproofing are securely installed.

END OF SECTION

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of building elements for alteration purposes.

C. Salvage of historicaly significant building elements and fixtures.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 1000 - Summary: Sequencing and staging requirements.

C. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

F. Section 04 0125 - Masonry Cleaning: Salvaging brick for reuse.

G. Setion 10 4400 - Fire protection Specialities: Refurbishing of existing fire extinguisher cabinets.

H. Section 12 6105 - Auditorium Seating Restoration: Restoring existing auditorium seating.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:
   1. Areas for temporary construction and field offices.

C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of five years of documented experience.

PART 2 PRODUCTS

2.01 SALVAGE MATERIALS

A. Carefully remove and turn over to the Owner, in existing undamaged condition, the following:
   1. Auditorium Chandeliers and ceiling mounted light fixtures.
   2. Stage lights.
   3. Wall clocks.
   4. Original pendant light fixtures.
   5. Wood trim and molding.

2.02 MATERIALS FOR REUSE

A. Auditorium Seating: Refer to Section 12 6105 - Auditorium Seating Restoration.

B. Fire Extinguisher and Hose Cabinets: Refer to Section 10 4400 - Fire Protection Specialities.

PART 3 EXECUTION

3.01 SCOPE

A. Remove portions of existing buildings in the following sequence:
   1. Remove masonry walls and plaster partitions as shown.
   2. Remove existing ceilings as shown.
   3. Remove existing flooring down to acceptable substrate, as shown.

B. Remove paving and curbs as required to accomplish new work.

C. Within area of new construction, remove foundation walls and footings to a minimum of 3 feet below finished grade.

D. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.

E. Remove concrete slabs on grade as indicated on drawings.

F. Remove other items indicated, for salvage, relocation, and recycling.
   1. Salvage existing brick for reuse.
      a. Remove mortar and stack unbroken bricks salvaged from demolition.
   2. Salvage original lighting fixtures, as indicated.
      a. Turn over to the Owner.
   3. Salvage original wall clocks, as indicated.
      a. Turn over to the Owner.

G. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.

6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
8. Do not close or obstruct roadways or sidewalks without permit.
9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Do not begin removal until built elements to be salvaged or relocated have been removed.

D. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

E. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

F. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

G. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

H. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 0510

CONCRETE MOISTURE VAPOR REDUCTION ADMIXTURE (MVRA)

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. High Performance Concrete Moisture Vapor Reducing Admixture (MVRA) for all new concrete slabs to receive adhesively applied flooring.

1.02 RELATED SECTIONS:

A. Division 03 Section "Cast-in-Place Concrete" for vapor retarder.

B. Division 09 Flooring Sections for flooring materials installed over concrete slabs that contain integral moisture vapor reduction admixture and for preparation requirements.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.04 REFERENCES

A. American Society for Testing and Materials International (ASTM)

1. ASTM D 5084: Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
2. ASTM E 1643: Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
3. ASTM E 1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
4. ASTM F 710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
5. ASTM C 494/C 494M-08a: Standard Specification for Chemical Admixtures for Concrete Type S.

1.05 SUBMITTALS

A. Product Data: Manufacturer's printed data.

B. Product test reports performed by a qualified independent testing agency evidencing compliance of products with specified requirements of moisture vapor transmission based on comprehensive testing of current products.

C. Manufacturer's certificate certifying admixture provided meets or exceeds specified requirements.

D. Sample life of the concrete warranty.

E. Sample adhesion guarantee.

F. Sample moisture letter.

G. MSDS.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm with not less than ten (10) years' experience in the manufacture of the specified concrete moisture vapor reduction admixture, capable of providing test reports indicating compliance with specified performance requirements, and able to provide on-site technical representation should the need arise. Selected product must have

certification of compliance with ASTM C494 /C494M testing protocols from an independent AASHTO approved laboratory.

B. Pre-installation Conference.
   1. Verify all are familiar with MVRA project specific quality control procedures, review concrete mix designs and examine procedures for ensuring quality of concrete materials. Each entity directly concerned with MVRA dosed concrete must attend in person, conference call, or provide electronic review of documents, mix designs and procedures. Those required to participate or to review include but are not limited to:
      a. Construction Manager.
      b. Independent testing agency responsible for concrete design mixtures, sampling and testing.
      c. Ready-mix concrete manufacturer.
      d. Concrete subcontractor
      e. Moisture Vapor Reduction Admixture manufacturer.

C. Ready Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

D. Moisture Vapor Reduction Admixture Collection Agent / Representative Qualifications
   1. Personnel conducting field sampling on behalf of the MVRA manufacturer shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

E. Slab Moisture Testing and Evaluation: Personnel performing laboratory tests shall be certified in the conduct of ASTM D5084 under the supervision of a licensed geotechnical engineer.
   1. The determination as to whether the concrete slab is prepared to receive flooring or coatings, rests with the MVRA manufacturer.

F. Source Limitations: Obtain each type of concrete moisture vapor reducing admixture from the same manufacturer.

G. ACI Publications: For slabs to receive moisture sensitive coatings or material, comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 302.2R-06, "Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring".

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver MVRA in manufacturer’s original, undamaged containers.

B. Store MVRA protected from exposure to harmful weather conditions and in a temperature controlled area above 36 degrees F.

C. Do not allow product to freeze. Should product freeze, immediately contact the MVRA manufacturer for further instructions.

1.08 WARRANTY

A. Moisture Vapor Reduction Admixture (MVRA):
   1. MVRA must be installed according to, and in compliance with, the manufacturer's published data sheet to include, but not limited to:
      a. Dosing instructions.
      b. Onsite representation and sampling requirements.

c. Use of an ASTM E 1745 vapor retarder installed following ASTM E 1643 and ASTM F710 guidelines.

2. Manufacturer's Warranty: To include:
   a. Term: Life of the concrete.
   b. Repair and/or removal of failed flooring.
   c. Placement of a topical moisture remediation system.
   d. Replacement of flooring materials like original installed to include material and labor.
3. Adhesion Warranty: MVRA Manufacturer shall provide an adhesion warranty to match the term of the adhesive and primer manufacturer's material defect warranty upon MVRA manufacturer's acceptance of field bond test.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design "Barrier One High Performance Moisture Vapor Reduction Admixture"
   1. Manufactured by Barrier One, Inc..; 522 S. Hunt Club Blvd., #303, Apopka, Florida 32703; P: 877.224.5850, F: 866.594.3490; Email at: info@barrierone.com

B. Subject to compliance with the requirements of this section, under provisions of Section 01 6000, substitutions may be considered.
   1. Failure to provide a product that meets or exceeds the MVRA warranty requirements of Part I and the MVRA field quality control requirements of Part 3 will result in all subsequent testing and slab remediation costs being borne by the ready mix supplier.

2.02 MATERIALS

A. Concrete moisture vapor reduction admixture (MVRA) for all interior slabs shall be a non-toxic, liquid admixture that is free of all volatile organic compounds.

B. Chemical reaction shall form a permanent barrier (capillary break) that is integral to the concrete, insoluble, and irremovable.

1.	Hydraulic conductivity:	Project specific maximum of 6.0 E-8 cm/s per ASTM D5084
2.	Toxicity:	None
3.	Odor:	None
4.	Flammability:	None
5.	VOC levels:	Zero
6.	Solvent:	Water
7.	Freeze Temp:	32 degrees Fahrenheit (00 C)(store above 360 F (2.30 C))
8.	Acid resistance:	Excellent
9.	Hazardous vapors:	None
10.	Installation:	All concrete
11.	Capillary break:	Calcium Silicate Hydrate
12.	pH:	11.3
13.	weight:	10.3 lbs/gal (net)
14.	Integral biocide to inhibit growth of mold and bacteria	

2.03 RELATED MATERIALS

A. Sheet Vapor Retarder: ASTM E 1745 compliant material, with a maximum permeance of 0.1 US Perms and a minimum thickness of 0.01". Include manufacturer's recommended adhesive or pressure-sensitive tape.
   1. Refer to Section 07 2616 - Under Slab Vapor Barrier/ Retarder.

2. It is the responsibility of the vapor retarder manufacturer to show compliance with the most current version of ASTM E1745.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Comply with the requirements of Division 03 Cast-in-Place Concrete, or other appropriate section, for concrete mixing, placing and curing.

B. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E1643, ASTM F710, ACI 302.2R-06 and manufacturer's written instructions.

C. Add MVRA in accordance with manufacturer's printed data sheet instructions:

D. For mix designs ranging from 0.42 to 0.52 w/cm, dose at 14 ounces per 100 pounds (414ml/45kg) of total cementitious materials.
   1. Remove an equal amount of water from the mix.
   2. Add separately from other admixtures at the tail end of the load.
   3. Mix designs below 0.42 and above 0.52 may require adjustment and consultation with MVRA manufacturer is required prior to their use.
   4. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete with MVRA according to ASTM C 94/C 94M; furnish batch ticket information showing dosage of MVRA.
   5. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Add the MVRA to where it makes direct contact with the ready mix and then rotate drum of batch truck on high for at least seven minutes prior to discharge.

E. Freshening onsite with held back mix water is acceptable so long as the practice is in accordance with published ACI guidelines and does not exceed the original water to cementitious material ratio or instructions of the structural engineer.

F. Use of water reducing admixtures is recommended to achieve slumps greater than 4" (102mm).

G. Use of other admixtures in the same batch as MVRA is acceptable so long as each admixture is added separately.

H. The inclusion of a shrink reducing admixture (SRA) is not acceptable

I. Cold-Weather Placement: Comply with ACI 306.1.

J. Hot-Weather Placement: Comply with ACI 301.

3.02 CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Cure concrete slabs to receive moisture sensitive coatings according to ACI 302.2R-06, by one or a combination of the following methods:
   1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure concrete containing MVRA for not less than 24 hours, longer if ambient conditions are hot, windy, and sunny or subject to periods of very low humidity. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall

within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3. Removal: After curing period has elapsed, mechanically remove curing compound prior to the installation of final flooring material in accordance with ASTM F-710.
   a. Do not chemically remove.

3.03 FIELD QUALITY CONTROL

A. Testing and Inspecting: The manufacturer of the moisture vapor reduction admixture will, at their expense, engage qualified agencies to obtain project specific sample cylinders and independent certified laboratories for subsequent testing per ASTM D5084 and preparation of test reports.

B. Testing of Slabs Containing MVRA:
   1. The moisture vapor reduction admixture (MVRA) manufacturer will perform all moisture testing in accordance with this specification and will issue project specific warranties and adhesion guarantees prior to installation of any slab finishes; no further field slab moisture nor pH testing shall be required.
      a. Failure to provide a product that meets or exceeds these requirements will result in all subsequent testing and slab remediation costs being borne by the contractor.
   2. A representative or agent of the MVRA manufacturer must be present at the jobsite during placement of all MVRA treated concrete.
      a. Do not proceed without this representative being present.
      b. A minimum of one business day notification is required.
   3. Field testing technician shall, at the expense of the MVRA Manufacturer, procure at least one 4 inch (102 mm) cylinder from every day of placement of MVRA dosed concrete for the purpose of subsequent hydraulic conductivity/coefficient of permeability testing.
   4. All cylinders shall be independently lab tested in accordance with ASTM D 5084 at the expense of the MVRA manufacturer.
   5. Test results must conform to specified limits.
      a. Should any cylinder from any day of placement deliver results in excess of 6.0 E-08 cm/sec, the concrete moisture vapor reduction admixture manufacturer shall procure, at their expense, a core (or cores) from that day of placement. This core (cores) shall be sent to an independent laboratory for hydraulic conductivity (coefficient or permeability) per ASTM D 5084.
      b. Should any core deliver results in excess of 6.0 E-08 cm/sec per ASTM D 5084, the concrete moisture vapor reduction admixture manufacturer shall provide, at their expense, a topical moisture mitigation system for all areas not meeting the stated limit.
   6. Proceeding with placement of concrete dosed with the MVRA without the required representation will result in the contractor bearing the cost to core and ship appropriate material for testing per ASTM D 5084.

3.04 REPAIRS

A. Make repairs to slab in accordance with Division 03 Section “Cast-in-Place Concrete” and as recommended by concrete moisture vapor reduction admixture manufacturer.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Floors and slabs on grade.

C. Concrete foundations.

D. Concrete reinforcement.

E. Joint devices associated with concrete work.

F. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Products and installation for sealants for saw cut joints and isolation joints in slabs.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for repointing 100 cubic yards of cast-in-place concrete, as described, in miscellaneous quantities and in multiple locations.
      a. This allowance includes purchase, delivery, and installation of cast-in-place concrete as directed by the Architect.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices
   1. Unit price for cast-in-place concrete slab, on grade or elevated.
      a. Unit of measure: Cubic yard of cast-in-place concrete.
   2. Unit price for cast-in-place concrete with formwork.
      a. Unit of measure: Cubic yard of cast-in-place concrete.

1.04 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

C. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).

D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; 2004 (Errata 2007).

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.

F. ACI 305R - Hot Weather Concreting; 2010.

G. ACI 306R - Cold Weather Concreting; 2010.

H. ACI 308R - Guide to Curing Concrete; 2001 (Reapproved 2008).

I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.

J. ACI 347R - Guide to Formwork for Concrete; 2014.

K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.

L. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.

M. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.

N. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.

O. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.

P. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.

Q. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.

R. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.

S. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.

T. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.

U. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2014.

V. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.

W. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.

X. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2014.

Y. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).

Z. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).

AA. ASTM E1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers (Metric); 2014.

AB. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011.

AC. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

AD. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).

AE. NSF 372 - Drinking Water System Components - Lead Content; 2011.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.

C. Mix Design: Submit proposed concrete mix design.

1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.

D. Samples: Submit samples of underslab vapor retarder to be used.

E. Samples: Submit two, 12 inch long samples of waterstops.

F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

H. 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 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.

D. For slabs required to include moisture vapor reduction admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover the cost of flooring failures due to moisture migration from slabs for life of the concrete.
1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
2. Provide warranty by manufacturer of MVRA matching terms of flooring adhesive or primer manufacturer's material defect warranty.

C. Moisture Emission Reducing Curing and Sealing Compound: Provide warranty to cost of flooring delamination failures for 10 years.
1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R 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 (60,000 psi).
1. Type: Deformed billet-steel bars.
2. Finish: Unfinished, unless otherwise indicated.

B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
1. Form: Flat Sheets.

2. WWR Style: As indicated on drawings.

C. Reinforcement Accessories:
1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
1. Acquire all cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C 33.
1. Acquire all aggregates for entire project from same source.

C. Lightweight Aggregate: ASTM C330/C330M.

D. Fly Ash: ASTM C618, Class C or F.

E. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

F. Water: Clean and not detrimental to concrete.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. Moisture Vapor Reduction Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed during curing to reduce moisture vapor emission and transmission, with no adverse effect on concrete properties.
1. Provide admixture in slabs to receive adhesively applied flooring.
2. Refer to Section 030510 - Concrete Moisture Vapor Reduction Admixture for additional information.
3. Manufacturers:
a. Barrier One, Inc; Barrier One Moisture Vapor Reduction Admixture: www.barrierone.com.

2.05 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. Installation: Comply with ASTM E1643.
2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.
3. Manufacturers:
a. Fortifiber Building Systems Group; Moistop Ultra 15: www.fortifiber.com/sle.
b. Stego Industries, LLC: www.stegoindustries.com.
c. W.R. Meadows, Inc.; PERMINATOR Class A - 15 mils: www.wrmeadows.com/sle.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

B. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.

1. Configuration: As indicated on drawings.
2. Size: As indicated on drawings.

C. 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.
1. Material: ASTM D1751, cellulose fiber.

2.07 CURING MATERIALS

A. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
1. Product dissipates within 7 to 10 days.
2. Manufacturers:
a. Dayton Superior Corporation; Clear Cure VOC J7WB: www.daytonsuperior.com.
b. Kaufman Products Inc.; Thinfilm 420 Resin Base: www.kaufmanproducts.net.

B. Moisture-Retaining Sheet: ASTM C171.
1. Curing paper, regular.

2.08 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. Concrete Strength: Establish required average strength for concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

D. Normal Weight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 pounds per square inch.
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
4. Water-Cement Ratio: Maximum 40 percent by weight.
5. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
6. Maximum Slump: 3 inches.
7. Maximum Aggregate Size: 3/4 inch.

2.09 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 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. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

1. Use latex bonding agent only for non-load-bearing applications.

C. 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.
   1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as shown on the drawings. Do not use sand.

3.03 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.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

E. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

F. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 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.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for conformance to specified tolerances.

B. 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 Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.

3. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.

C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. 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.

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

A. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
3. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

3.08 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-saturated sand, water-fog spray, or saturated burlap.
3. Final Curing: Begin after initial curing but before surface is dry.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Slab Testing: Cooperate with manufacturer of specified moisture vapor reduction admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

3.10 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. 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.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 03 3511
CONCRETE FLOOR FINISHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface treatments for concrete floors and slabs.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

B. Section 03 3000 - Cast-in-Place Concrete: Curing compounds that also function as sealers.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for 3,000 square feet of polished concrete floor finish.
      a. This allowance includes purchase, delivery, and installation of polished concrete floor finish in multiple locations, as directed by the Architect..
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices
   1. Unit price for polished concrete floor finish.
      a. Unit of measure: 1,000 square feet of polished concrete floor finish.

1.04 REFERENCE STANDARDS

A. CPAA: Concrete Polishing Association of America "Glossary."

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with concrete floor placement and concrete floor curing.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.

C. Maintenance Data: Provide data on maintenance and renewal of applied finishes.

1.07 MOCK-UP

A. Mock-Up Size: 10 feet square.

B. Locate where directed.

C. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.09 FIELD CONDITIONS

A. Maintain light level equivalent to a minimum 200 W light source at 8 feet above the floor surface over each 20 foot square area of floor being finished.

B. Do not finish floors until interior heating system is operational.

C. Maintain ambient temperature of 50 degrees F minimum.

PART 2 PRODUCTS

2.01 CONCRETE FLOOR FINISH APPLICATIONS

A. Unless otherwise indicated, all concrete floors are to be finished using polished concrete finish.

B. Liquid Densifier/Hardener:
   1. Use at following locations: All exposed concrete.

C. Concrete Stain:
   1. Use at following locations: All exposed concrete.

D. High Gloss Clear Sealer:

2.02 DENSIFIERS AND HARDENERS

A. Liquid Densifier/Hardener: Penetrating chemical compound that reacts with concrete, filling the pores and dustproofing; for application to concrete after set.

2.03 COATINGS

A. Concrete Stain or Dye: Translucent, penetrating compound for interior or exterior use; must be finished with a topical sealer.

B. High Gloss Clear Coating: Transparent, non-yellowing, water- or solvent-based coating.
   1. Composition: Acrylic polymer-based.

2.04 POLISHED CONCRETE SYSTEM

A. Polished Concrete System: Materials, equipment, and procedures designed and furnished by a single manufacturer to produce dense polished concrete of the specified sheen.
   1. Acceptable Systems:
      a. ARDEX Engineered Cements; ULTRAFLOR Polished Concrete System; ARDEX PC-T Concrete Topping; ARDEX PC Finish sealer: www.ardexamericas.com.
      b. L&M Construction Chemicals, Inc., a subsidiary of Laticrete International, Inc.; FGS Permashine Concrete Polishing System: www.lmcc.com.
      c. L.M. Scofield Company; SCOFIELD® Formula One™ Ground & Polished Concrete Systems: www.scofield.com.
      d. W.R. Meadows, Inc; Induroshine and Bellatrix Concrete Enhancer: www.wrmeadows.com/sle.
      e. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

3.02 GENERAL

A. Apply materials in accordance with manufacturer's instructions.

B. Use coarse grinding discs to remove pits, blemishes, stains and light coatings, in a three- to four step process using ever finer grits.
   1. Remove waste dust or slurry and dispose of properly.

C. Proceed with the honing of the floor with 100-grit to 400-grit diamond abrasive discs.
   1. Prior to honing, apply two coats of stain following manufacturers instructions.
   2. Color to be applied to match approved mock-up sample.

D. Finishing:
   1. CPAA Aggregate exposure: Cream - very little surface cut depth; little aggregate exposure.
   2. CPAA Reflective clarity and Sheen: Semi-polished - medium to high reflective sheen using a minimum totalof 6 grit lefvels up to 800 grit.

3.03 COATING APPLICATION

A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.

B. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.

C. Apply coatings in accordance with manufacturer's instructions, matching approved mock-ups for color, special effects, sealing and workmanship.

3.04 CONCRETE POLISHING

A. Execute using materials, equipment, and procedures specified by manufacturer, using manufacturer approved installer.
   1. Final Polished Sheen: Semigloss finish; other sheens are included as comparison to illustrate required sheen; final sheen is before addition of any sealer or coating, regardless of whether that is also specified or not.
   2. Semi-Gloss Finish: Reflecting overhead and side images from 35 to 45 feet away.

B. Protect finished surface as required and as recommended by manufacturer of polishing system.

END OF SECTION

SECTION 04 0125
MASONRY CLEANING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. General cleaning of brick and limestone masonry.
   1. General cleaning of brick masonry as indicated. Types of soiling to be removed include atmospheric and biological soiling.
   2. General cleaning of limestone masonry as indicated. Types of soiling to be removed include atmospheric and biological soiling.

B. Spot cleaning of rust from brick and limestone masonry
   1. Types of soiling to be removed include rust, copper, paint spatters, mastic and sealants.

C. Spot cleaning of paint from brick and limestone masonry
   1. Types of soiling to be removed include rust, copper, paint spatters, mastic and sealants.

D. Cleaning of salvaged brick in preparation for reuse.

1.02 REFERENCES

A. Masonry cleaning procedures shall adhere to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for masonry cleaning shall be as outlined in "Preservation Brief No. 1 (2000) as published by the National Park Service.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for cleaning of 15,000 square feet of brick and limestone masonry on the 1927 Building.
      a. This allowance includes purchase, delivery, and installation of cleaning of brick and limestone masonry in multiple locations on the 1927 Building, as directed by the Architect.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.
   2. Provide an allowance for cleaning of 10,000 square feet of brick and limestone masonry on the Annexes.
      a. This allowance includes purchase, delivery, and installation of cleaning of brick and limestone masonry in multiple locations on the Annexes, as directed by the Architect.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices
   1. Unit price for cleaning of brick and limestone masonry.
      a. Unit of measure: Square foot of masonry surface cleaned.

1.04 SUBMITTALS

A. Product data for all specified masonry cleaning products.
   1. Product literature shall include technical specifications, instructions for handling, mixing and application and Material Safety Data Sheets.

B. Cleaning Procedures:
   1. Submit procedures for all types of masonry cleaning after completion of all specified test panels.

2. Procedures shall include sequence of work, products and equipment to be used, application parameters (concentration, pressure, dwell time, etc), and protection measures for surrounding materials.
3. Manufacturer's Instructions: For cleaning materials, indicate special procedures, conditions requiring special attention .

1.05 QUALITY ASSURANCE

A. Test Panels: prepare test panel for each type of masonry cleaning specified to confirm efficacy of specified product and application parameters.
   1. Refer to Section 04 0130 - Masonry Cleaning Test Panel.
   2. Locate where directed.
   3. Acceptable panel and procedures employed will become the standard for work of this section.

B. The Contractor performing the work of this Section shall have a minimum of ten years experience in masonry cleaning and restoration and shall have successfully completed at least three projects of similar scope within the previous five years.
   1. Mechanics executing the test panels shall be the same mechanica performing cleaning work specified in this Section.

1.06 DELIVERY, STORAGE AND HANDLING OF MATERIALS

A. Masonry cleaning materials and equipment shall be delivered and stored in such a manner as not to interfere with the operation and daily maintenance of the facility. Proposed material and equipment storage locations shall be approved by the Owner’s representative prior to delivery of the materials. Materials and equipment shall not be stored inside the building.

B. Waste material, packaging, debris and effluent associated with the masonry cleaning tests shall be collected and disposed of in accordance with local, state and federal environmental regulations.

C. Masonry cleaning materials shall be delivered in manufacturers’ original packaging with product name and manufacturer clearly visible thereon and shall be stored in accordance with the manufacturer’s instructions. Protect from direct sunlight and temperatures above or below the manufacturer’s suggested range.

1.07 PROJECT / SITE CONDITIONS

A. Complete masonry cleaning prior to masonry restoration.

B. The work of this Section shall be executed only when the air and surface temperatures are 50 degrees F and rising or less than 90 degrees F and falling. Temperature shall be 50 degrees F and above for at least 2 hours after completion and anticipated to be above 40 degrees F for at least two weeks after completion.

C. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
   1. Protect woodwork, windows and metal surfaces near to masonry areas to be cleaned from overspray and possible chemical or water damage from cleaning operations.
   2. Coordinate with Owner’s Representative to remove personal vehicles and Owner’s equipment from the area during cleaning operations to prevent damage from overspray.
   3. Remove and store all metal, wood and plastic plaques and signage prior to beginning cleaning operations. The Contractor shall reinstall plaques and signage as directed after completion of the work.
   4. Complete masonry cleaning tests prior to completion of masonry restoration samples.

5. Complete masonry cleaning tests prior to application of liquid-applied membrane materials to masonry surfaces.

D. The Contractor shall erect waterproof enclosures around areas where cleaning operations are in progress to protect nearby property and passers-by from overspray of cleaning chemicals or rinse water.
   1. Coordinate masonry cleaning with Owner's Representative to allow for temporary closing of affected building entrances, ventilation intakes, etc. in the work area.

E. Contractor personnel performing masonry cleaning operations shall be provided with gloves, respirators and protective clothing as recommended by the manufacturer of the masonry cleaning products.

F. Access to work areas shall be from the exterior only. Where access to the building interior is required, the Contractor shall coordinate with the Owner's representative. Under no circumstances are cleaning materials to be stored in or transported through the building.

PART 2 - PRODUCTS

2.01 GENERAL

A. Water: Cleaning water shall be potable, free of injurious amounts of oil, soluble salts, alkali, acids, metallic ions and other impurities which might stain or otherwise damage masonry.

2.02 GENERAL CLEANING

A. SafRestorer, (ProSoCo, Inc., Kansas City, KS) - dilution to be determined during product testing 2016.

B. Artisan Heavy Duty Restoration Cleaner, (Chemique, Morrestown, NJ) - product to be used full- strength - product testing 2016

2.03 RUST REMOVER

A. Sodium citrate powder, available at drugstores and online gourmet food suppliers.

B. Glycerine liquid, available at drug and hardware stores

C. Mix 7 parts glycerine to 1 part sodium citrate to 6 parts water.
   1. Mix solution with inert poultice material such as white flour, fullers earth or clean paper pulp to form a paste.

2.04 PAINT REMOVER

A. Back to Nature (Dynacraft Products, Manalapan, NJ).

B. S-301 Stripper (Cathedral Stone Products, Jessup, MD).

C. Architect-approved equivalent.

2.05 ASPHALT, SEALANT AND MASTIC REMOVAL

A. Cleaning agent for removal of asphalt, tar, asphaltic aluminum paint, etc. shall be one of the following products:
   1. Asphalt & Tar Remover by ProSoCo, Inc., Lawrence, KS 66117 (919) 281-2700.
   2. Tar-Gone as manufactured by Arrow-Magnolia, Dallas, TX (877) 277-6998.
   3. Black Mastic Remover as manufactured by Dumond Chemicals, New York, NY (212) 869-6350.

2.06 ACCESSORIES AND RELATED MATERIALS

A. Temporary Sealant: Non-staining, removable sealant suitable for masonry substrates.

B. Brushes for scrubbing masonry shall be stiff-bristle, non-metallic brushes as recommended by the manufacturer of the masonry cleaning products.
   1. For chemical cleaning, use only brushes that are resistant to chemical cleaners being used.

C. Low-pressure spray equipment for the application of cleaning materials shall be equipped with nozzles, valves and other components resistant to cleaning materials to be applied.

D. Low-Pressure Sprayers:
   1. Provide hand-pumped, very low-pressure (< 100 psi) sprayers for application of cleaning solutions to masonry surfaces.
   2. Do not apply cleaning solutions with gasoline-powered or electric pressure washing equipment.
   3. All components of sprayer must be compatible with solutions to be applied.

E. Pressure Washing Equipment:
   1. Provide gasoline-powered or electric pressure washing equipment for rinsing of cleaned masonry surfaces.
   2. Equipment shall be equipped with 45 degree fan-tip nozzle.
   3. Provide pressure gauge and regulator at nozzle for monitoring and adjustment by the operator.

PART 3 - EXECUTION

3.01 GENERAL

A. Complete masonry cleaning prior to completing masonry restoration

B. Complete cleaning of ferrous stains only after ferrous components have been removed or painted.

3.02 SURFACE PREPARATION

A. Inspect substrates prior to cleaning.

B. Fill open cracks, joints, penetrations, etc with removable sealant to prevent penetration of cleaning materials and rinse water to building interior.

C. Remove and store light fixtures, downspouts and other appurtenances to ensure full access to wall surfaces. Remove all vegetation prior to beginning cleaning tests.

D. Masonry cleaning, masonry restoration and sealant installation shall be completed prior to application of water repellent or acrylic membranes.

E. Coordinate masonry cleaning tests with Owner's Representative to allow for temporary closing of affected building entrances, ventilation intakes, etc. in the work area.

F. The Contractor shall examine the surfaces to be cleaned prior to commencing cleaning operations. Large cracks (1/16" or larger) and open joints discovered shall be temporarily filled with removable sealant to prevent penetration of cleaning solutions into the core of the wall and to the interior.

G. Window and door openings in the vicinity of cleaning operations, particularly on lower floors, shall be protected from leakage and damage from cleaning solutions by plastic sheeting or other waterproof membrane. Open joints around window frames and door frames shall be filled with temporary sealant to prevent leakage.

H. Masonry surfaces shall be saturated with water prior to application of proprietary cleaning products to prevent undesirable absorption of cleaning chemicals.

3.03 GENERAL CLEANING

A. Apply cleaning materials with low-pressure sprayer, working from bottom to top.
   1. Dwell time: TBD.
   2. Agitate with natural or plastic bristle brushes to loosen soiling

B. Rinse cleaned surfaces with clean water, working from bottom to top.
   1. Use a 15-45 degree fan tip nozzle.
   2. Nozzle pressure not to exceed 800 psi, 6 to 8 gpm.
   3. Nozzle distance no less than 12 inches from masonry surface.

3.04 SPOT CLEANING: FERROUS STAINS

A. Dampen stone surfaces to be cleaned with glycerine/sodium citrate solution.

B. Mix remaining solution with filler to form poultice paste.

C. Apply a thick (1/4 inch) layer of poultice paste to the masonry surface extending several inches beyond the boundary of the stained area.

D. Cover poultice with plastic sheeting and seal with masking tape.

E. Allow poultice to dwell on the surface for 48 hours before removing plastic sheeting.

F. Remove poultice material with wood or plastic scraper and rinse the surface with clean water and allow to dry.

3.05 SPOT CLEANING: PAINT

A. Apply specified paint remover to spattered areas.
   1. Allow product to dwell until paint is softened and dissolved.
   2. Dwell time shall be as determined in the performance of the approved test panel.

B. Agitate with a bristle brush to loosen and lift deposits.

C. Flush surface with water to remove paint and stripper residue.
   1. Neutralize if required by manufacturer’s instructions.

D. Repeat application as necessary to completely remove paint marks.

3.06 SPOT CLEANING: MASTIC, TAR AND SEALANTS

A. Clean bituminous material from surfaces of walls using wood scrapers to remove bulk of material prior to applying specified remover.

B. Clean surfaces of masonry using specified cleaning agent in accordance with manufacturer's instructions.
   1. Pre-wet the surface with clean water.
   2. Thoroughly rinse the surface after cleaning and apply neutralizing agent if required by manufacturer.
   3. Keep area below stained area wet and rinsed free of cleaning residues. Remove protective coverings from adjacent surfaces and repair any damage or staining caused by the cleaning operation to adjacent surfaces.
   4. Remove protective coverings from adjacent surfaces and repair any damage or staining caused by the cleaning operation to adjacent surfaces.

3.07 BRICK SALVAGE

A. Identify existing bricks to be salvaged prior to demolition activities.

B. Carefully remove bricks to limit breakage.

C. Stack bricks in separate piles.

1. One pile for clean, whole bricks.
2. One pile for clean, partial bricks.
3. One pile for bricks to be cleaned.

D. Stockpile salvaged bricks to prevent damage from other demolition and construction activities.

END OF SECTION

SECTION 04 0126
MASONRY RESTORATION

PART 1 - GENERAL:

1.01 SECTION INCLUDES

A. Restoration, replacement and repairs to the limestone masonry as indicated on the Drawings including, but are not limited to, the following:
   1. Raking and repointing of selected joints in limestone masonry as indicated.
      a. Contractor shall assume multiple pointing/patching mortars may be required to achieve suitable color matches.
   2. Replacement of damaged and deteriorated liimestone with new material of matching design and quality.
   3. Installation of lead T-caps in limestone coping joints.
   4. Cementitious repair of cracked limestone units as indicated.
   5. Mortar patching of minor limestone spalls as indicated.
   6. Application of acrylic membrane on horizontal wash surfaces as indicated.
   7. Application of penetrating stone sealer to limestone elements as indicated.

B. Repairs to brick unit masonry as indicated on the Drawings. Repairs include, but are not necessarily limited to, the following:
   1. Raking and repointing of brick masonry joints and cracks as indicated.
      a. Contractor shall assume multiple pointing/patching mortars may be required to achieve suitable color matches
   2. Replacement of cracked bricks as indicated.
   3. Mortar patching of anchor holes in brick units as required.

C. Replacement of damaged steel window lintel including disassembly, salvage and reinstallation of brick soldier course above and additional masonry as required at bearing points.

1.02 RELATED REQUIREMENTS

A. Section 04 0125 - Masonry Cleaning

B. Section 04 2000 - Unit Masonry: Brick masonry units.

1.03 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.

B. ASTM C241 - Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic; 90(2005).

C. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.

D. ASTM C568/C568M - Standard Specification for Limestone Dimension Stone; 2010.

E. ASTM C 616/C616M - Standard Specification for Quartz-Based Dimension Stone; 2015.

F. ILI (HB) - Indiana Limestone Handbook; Indiana Limestone Institute of America, Inc.; 2007, 22nd Edition.

G. Masonry restoration shall conform to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for masonry pointing and repair shall be as outlined in “Preservation Brief No. 2 (September 1998) as published by the National Park Service.

H. Masonry restoration work shall comply with ACI / ASCE 530.1-04. Contractor shall maintain at least one copy of ACI / ASCE 530.1-04 on site.

1.04 SUBMITTALS

A. Product data for all masonry restoration materials.

B. Samples of pointing/patching mortars provide cured samples of proposed mixes.
   1. Contractor shall be prepared to submit up to 6 samples each of pointing/patching mortars without additional compensation.
   2. Pointing / patching materials to be matched to cleaned masonry.

C. Samples of new stone materials

D. Shop drawings of new stone fabrications.

E. Submit certification of completion of manufacturer's training for each mechanic if required by manufacturer of patching mortar

1.05 QUALITY ASSURANCE

A. Provide mock-up panels of brick pointing/patching/replacement and limestone pointing / patching.

B. Mock-up panels to be evaluated twice, once after joints are raked/patches are prepped and again after pointing/patching is completed.

C. The Work of this contract shall be performed by the same mechanics constructing the mock-up panel.

D. The Contractor performing the work of this Section shall have a minimum of ten years experience in restoration of historic masonry and shall have successfully completed at least three projects of similar scope within the previous five years.

E. Do not change sources for mortar and stone materials during the course of the work. All material of a given type shall be from a single source.

F. All personnel to be involved in limestone and brick patching work using Jahn Restoration Mortar must submit certification of completion of the Jahn Masonry Restoration course sponsored by Cathedral Stone Products, Inc.

1.06 MOCK-UP

A. Provide a mock up of limestone repair, including a cementitious repair, a dutchman repair and a complete unit replacement.
   1. Limestone mortar patch: provide three 1'-0" wide by 3 inch high by 2 inch deep patches.
   2. Limestone dutchman repair: provide one 1'-0" wide by 3 inch high by 4 inch deep patch.
   3. Limestone replacement: Provide one coping stone (Annex "square" profile).

B. Provide a mock up of brick repair, including repointing, brick patching and unit replacement.
   1. Brick repointing: Provide three 2'-0" wide by 2'-0" high samples of repointing.
   2. Brick patching: Provide patched three bricks.
   3. Brick replacement: Replace 10 bricks in at least five discrete locations.

C. Locate where directed.

D. Mock-up may remain as part of the Work, if approved by the Architect.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect stone from discoloration during storage on site.

B. Provide ventilation to prevent condensation from forming on stone.

C. Handle and store cut limestone items in protective cartons or trays. Do not remove from protective packaging until ready for installation.

1.08 PROJECT / SITE CONDITIONS

A. Normal conditions for the work of this Section shall be defined as when the air and surface temperatures are 40 degrees F and rising or less than 90 degrees F and falling. When temperatures are predicted to rise above or fall below this temperature range, the Contractor may proceed using approved hot and cold weather procedures as defined by the Masonry Institute of America.
   1. Reference Masonry Institute of America temperature requirements for masonry work.
      a. Cold Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

B. The Contractor is responsible for protecting existing adjacent building materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
   1. Prevent penetration of dust from masonry operations into the building by protecting all windows, ventilation openings and HVAC equipment in the vicinity of the work area.
   2. Protect all window and door glass and frames from impact and abrasion damage from flying debris using plywood or other substantial barrier.
   3. Protect adjacent membrane roofing, flashing and scuppers during masonry repairs. Erect protection to prevent masonry debris from dropping onto adjacent roof surfaces. Provide sufficient protection to roof surfaces to prevent point loading from scaffold or protective structures.

C. The Contractor shall erect barricades, caution tape or other obstacles at street level as required to prevent access by visitors to the work area. When working over building entrance and exit areas, provide sturdy protection over walkways to guard against falling debris

D. Provide protection for membrane roofs.

E. Provide protection of copings if swing stages to be used.

PART 2 - PRODUCTS:

2.01 MATERIALS

A. Portland Cement: ASTM C150.
   1. Type: Type I - Normal.
   2. Color: Gray and white Portland cement may be combined as required to match existing mortar..

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Aggregate: ASTM C144. Clean, hard natural sand, free from salt, clay, loam and other foriegn materials and shall match the color and texture of the original mortar sand.
   1. Sand sieve analysis:
      a. Passing through #8 sieve not less than 100%
      b. Passing through #10 sieve not less than 95%
      c. Passing through #30 sieve between 70% and 90%
      d. Passing through #50 sieve between 15% and 40%
      e. Passing through #100 sieve not over 15%

D. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.

1. Color(s): To match existing historic mortar, and as approved by the Architect.
2. Mortar colorant: product manufactured by Solomon Grind-Chem Service, Medusa or other approved manufacturer.

E. Water: Clean and potable.

F. Bonding Agent: Latex type approved by patching mortar manufacturer.

2.02 LIMESTONE PATCHING MORTAR:

A. Jahn Restoration Mortar M70: As manufactured by Cathedral Stone Products, Inc.
1. Color shall be selected by the Architect from manufacturer's standard range.
2. If no suitable match can be found from the standard range then a custom color match will be required.

B. Other Approved Manufacturers:
1. Lithomex Stone Repair Mortar (deGruchy Limeworks, Media, PA)
2. HL60 Limestone Repair Mortar (US Heritage Group, Chicago, IL)

2.03 POINTING MORTAR:

A. Masonry Cement: Not permitted.

B. Brick and limestone - Type N, setting mortar (field-mix).
1. 1 part by volume Portland cement
2. 1 parts by volume lime
3. 6 parts by volume sand

C. Historic Exterior Masonry Pointing Mortar: Type O; color to match existing.
1. 1 part by volume Portland cement
2. 2 parts by volume lime
3. 7 parts by volume sand

D. Bluestone - Type S
1. 1 part by volume Portland cement.
2. 1/2 part by volume lime
3. 4 1/2 parts by volume sand

2.04 BRICK

A. Replacement Brick: ASTM C-216, Grade SW, Type FBS fabricated to match the existing bricks.
1. New brick shall match the custom size, shape, texture and color range of adjoining brick.
2. Contractor shall be responsible for identifying potential color matches.
3. New facing brick shall not exceed approved variations in color and texture.

2.05 STONE

A. Limestone: Indiana Oolitic Limestone; complying with ASTM C568/C568M Classification II - Medium Density.
1. Grade: Standard, per ILI Handbook.
2. Color: Gray, to match existing.
3. Surface Texture: Match existing.
4. Acceptable Producers:
a. Indiana Limestone Company: www.indianalimestonecompany.com.

B. Bluestone: Paving slabs made from quartz-based stone complying with the requirements of ASTM C 616, Classification II Quartzitic Sandstone.

1. Stone Abrasion Resistance: Minimum value of 15, based on testing according to ASTM C 241.
2. Finish: Thermal

2.06 ACCESSORIES:

A. Stainless steel pins, if required for anchoring cementitious limestone patches, shall be Type 304 stainless steel all-thread rods, diameter to match existing anchors to be removed. Length shall be as required by the depth of the patch to be anchored. Ensure minimum embedment of 3 inches or 1/3 the depth of the section, whichever is less.

B. Epoxy adhesive for embedding anchors and pins shall be a high modulus epoxy resin conforming to ASTM C-881, Type I, II, IV and V, Grade 3 epoxy resin adhesive.

C. Joint caps for use in parapet joints shall be lead T-caps conforming to Federal Specification QQ-L-171, Grade B, sized to span the width of the sealant joint plus an allowance for movement plus ¼ inch. Lead caps shall be products of one of the following manufacturers:
   1. Weathercap, Inc., Slidell, LA
   2. Nuclead / Sharp Manufacturing, West Bridgewater, MA
   3. LITSCO, Glendale, NY

D. Sealant for installation of lead T-caps: Single-Component Urethane or Polyurethane Sealant: ASTM C920-87, non-sag, gun grade, Type M or S, Grade NS, Class 25, use group NT, M, O and I. Architect shall select color from manufacturer's full range of colors. Provide one of the following, or approved alternate:
   1. "Sikaflex 1a"; Sika Corp., Lyndhurst, NJ
   2. "Vulkem 116"; Tremco, Inc., Beachwood, OH
   3. “NP-1”, Sonneborn/Chemrex, Shakopee, MN.
   4. DynaTrol I-XL, Pecora, Inc., Harleysville, PA
   5. Architect approved equal.

E. New steel lintels shall be ASTM A 36 (Hot Dipped Galvanized). Length and size to match existing lintel to be removed.
   1. Refer to Section 05 5000 - Metal Fabrications for additional information.

F. Acrylic Waterproofing Material: See Section 07 1800 - Cold Fluid-Applied Waterproofing for material information.

G. Water repellent for application to limestone surfaces shall be a water-based solution of potassium methyl siliconate such as Natural Stone Treatment WB as manufactured by ProSoCo, Inc., Lawrence, KS or Architect-approved equivalent.

PART 3 - EXECUTION:

3.01 GENERAL

A. Masonry cleaning to be completed prior to masonry restoration

B. All pointing and masonry restoration to be complete prior to application of fluid-applied membrane coating and penetrating masonry sealers

3.02 PREPARATION

A. Remove external appurtenances including downspouts, signage/plaques, etc. to permit raking and repointing the wall behind these items.

B. Remove all nails, hooks and surface attachments from masonry and masonry joints.

C. The use of power tools for mortar removal must be demonstrated on a sample mock-up and approved by the Architect.

1. Final preparation of the joint shall be done by hand tools.
2. Limestone joints to be raked using low-pressure pneumatic chisel rather than grinder
3. Grinders may be used for raking joints in brick masonry but intersections between head and bed joints are to be finished by chisel to avoid overrunning into adjacent bricks

D. Rake joints to be repointed to a minimum depth of ¾ inch or to sound mortar.
   1. Remove any loose or disintegrated mortar beyond this minimum depth.

E. Areas of stone to be patched shall be squared off and excavated by low-pressure pneumatic chisel to a minimum depth of ¾ inch.
   1. Do not featheredge patching mortar

F. Cross-joints in masonry parapets shall be raked to a depth for joint cap installation. Rake back to accommodate the depth of the cap anchor plus ¼ inch or to sound mortar. Repoint, leaving sufficient depth to receive sealant and anchor flange of lead joint cap.

G. Remove mortar cleanly from bricks, leaving square corners at the back of the cut.

H. Before filling, remove loose particles and dust with a jet of water.

I. Joint surfaces shall be damp without standing water for repointing.

J. Mix dry mortar ingredients thououghly before mixin with water.
   1. Add half the amount of water into the dry mixture and mix thoroughly.
   2. Add remaining water in small portions until desired working consistancy is achieved.

3.03 MIXING PROCEDURES

A. Pointing Mortar:
   1. Mix mortar in accordance with ASTM C-270.
   2. Measure materials by volume or equivalent weight as indicated. Do not measure by shovel.
   3. Mix ingredients in a clean mechanical batch mixer for 3 to 5 minutes.
   4. Mortar shall be prehydrated to reduce shrinkage. Lime and sand shall be thoroughly mixed, adding only enough water to produce a damp, unworkable mix which will retain its form when pressed into a ball. Mortar shall stand in this condition for 1 hour. Add Portland cement and remainder of water and mix to provide a workable mortar consistency. Place mortar in final position within two hours of mixing. Do not retemper or use partially hardened mortar.

B. Limestone and Brick Patching Mortar: Mix and apply in accordance with manufacturer's instructions.

3.04 INSTALLATION

A. Fill areas where mortar has been removed to a depth greater than one inch first, compacting the pointing mortar in several layers.

B. Fill the entire joint in successive 1/4 inch layers from the back, compressing the mortar into the corners.

C. Continue filling the joint with successive 1/4 inch layers when the previous layer has achieved thumb-print hardness. Continue until the pointing mortar is flush with the face of the brick.
   1. For molded or uneven-edged brick, recess the final surface of repointing mortar.

D. When final layer of repointing mortar is thumb-print hard, tool the joint to match the historic joint.

E. Horizontal water-shedding joints: Rake out joint to required depth and install lead "T" strip joint protection.

1. Rake back and cut out all joints to a depth to accommodate anchor shaft length plus 1/4 inch.
2. Seat specified backer rod to proper depth of 1/4’’ below anticipated position of tip of lead "T" strip anchor shaft.
3. Prime stone, if required, allowing for tacky dry. Mask stone at edges of "T" strip.
4. Fill joint with selected sealant/caulk to an excess of 1/8 inch of masonry surface.
5. Seat pre-contoured lead "T" strip and firmly bed the bonding grooves on the underside of lead "T" strip in sealant with no voids between lead "T" strip and masonry.
6. Remove excess sealant, and when set, remove masking tape.

3.05 LIMESTONE PATCHING

A. Do not use any additives, such as bonding agents, accelerators, or retardants in the mortar.

B. Preparation for Repairs:
1. Remove loose mortar and masonry prior to installation of the repair mortar.
2. Verify integrity by "sounding" masonry with a hammer.
3. Cut the edges of the repair area to provide a minimum depth of 1/4 inch.
   a. The edges of the repair should be square cut.
   b. Do not allow any feathered edges in the repair area.
4. Pre-wet the substrate to prevent the substrate from drawing moisture out of the repair. Re-wet the surface immediately before applying the repair material.

C. Mixing Mortar for Repairs
1. Do not mix more material than can be used within 30 minutes.
   a. Discard any mixed material that has been unused for 30 minutes.
2. Follow manufacturer's instructions for mixing ratios.

D. Application of Repair Material
1. Apply the mortar mix according to manufacturer's directions.

E. Finishing Techniques
1. Obtain a smooth finish repair to match existing stone.
   a. Scrape down to the original profile.
   b. Trowel to leave a smooth surface.
   c. Clean any mortar residues from area surrounding the repair by sponging with clean water before repair material sets.

F. Curing Procedure
1. Lightly mist the repair with water to wet the entire surface of the finished repair according to the manufacturer's instructions.
2. Time will vary with temperature and humidity.
3. Mist several times a day on the three days following the repair installation.

3.06 MASONRY DISASSEMBLY AND RECONSTRUCTION

A. Carefully dismantle selected areas of masonry where designated on the Drawings. Dismantle brick and limestone masonry as required for access to the lintels designated for removal and replacement, salvaging components designated for reuse to the greatest extent possible.

B. Rake or grind mortar from joints to the greatest extent possible before attempted removal of the stone components. Avoid excessive prying against the arrises of the selected masonry units to avoid spalling and chipping.

C. Clean old mortar and sealants from masonry units to be reassembled. Drill out original anchors and install new anchors as indicated on approved shop drawings.

D. Where lintels or other structural members are to be removed, install shoring to support masonry above until replacement structural members can be installed.

E. Reset masonry units to proper position, straight and plumb and true to line and level, with full mortar bed. Ensure that vertical head joints are completely filled with mortar. Rake and point as described above except for joints designated to receive flexible sealant.

F. Reinstall adjacent materials or patch in kind as required to complete the installation.

3.07 WATER REPELLENT APPLICATION

A. Mask all glass and painted surfaces prior to beginning water repellent application. Protect adjacent brick masonry not to be treated from drips and overspray. Collect runoff at base of wall.

B. Apply specified water repellent treatment in a saturating coat to thoroughly dry stone using a low-pressure spray. Working from the bottom upward, apply enough material to allow a 4 to 6 inch run-down from the point of spray contact during application.

C. Apply a second saturating coat within 5 to 10 minutes of the first application.

D. Where excess liquid accumulates on horizontal surfaces, sweep clean or absorb with a clean cloth. Do not allow puddles of material to remain on masonry surfaces.

3.08 MEMBRANE APPLICATION

A. Preparation
   1. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, dust-free, and dry substrate for waterproofing application.
   2. Mask off adjoining surfaces not receiving waterproofing to prevent spillage or overspray affecting other construction.
   3. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, and other voids.

B. Application
   1. Refer to Section 07 1800 - Cold Fluid-Applied Waterproofing for information.

3.09 CLEANING

A. After tooling and the mortar has dried but before fully hardened, remove excess mortar from the edge of the joint with a stiff bristle brush.

B. No chemical or acid cleaning shall be started without a demonstration sample approved by the Architect.

C. Remove uncured limestone patching mortar from the perimeter of the repair before it dries using clean water and a rubber sponge. Repeat several times with clean water to prevent staining of adjacent masonry. Cured mortar may only be removed chemically or mechanically.

D. Remove uncured mortar from tools and equipment with water as soon as possible. Cured material may only be removed chemically or mechanically

END OF SECTION

SECTION 04 2000
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete Block.

B. Clay Facing Brick.

C. Interior Slate Stools

D. Flashings.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 04 0125 - Masonry Cleaning

B. Section 04 0126 - Masonry Restoration

C. Section 04 4301 - Stone Masonry Repair: Stone restoration and replacement.

D. Section 07 2100 - Thermal Insulation: Insulation for cavity spaces.

E. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashing and trim.

F. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.

1. Provide an allowance of 2000 face bricks.

a. This allowance includes purchase, delivery, and installation of face brick to match existing, as directed by the Architect.

b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

1.04 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2011.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015b.

C. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2014.

D. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

E. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2014.

F. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

G. ASTM C476 - Standard Specification for Grout for Masonry; 2010.

H. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2005.

I. BIA Techical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.

J. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2005.

K. BIA Technical Notes No. 7 - Water Penetration Resistance - Design and Detailing; 2005.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

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

C. Samples: Submit four samples of facing brick units to illustrate color, texture, and extremes of color range.

D. Samples of slate stool material.

E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

B. The Work of this contract shall be performed by the same mechanics constructing the mock-up panel.

1.07 MOCK-UP

A. Construct a masonry wall as a mock-up panel representing the appearance and workmanship of the new construction, sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.

B. Locate where directed.

C. Mock-up may not remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

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

2.02 BRICK UNITS

A. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
   1. Color and texture to match Architect's sample.
   2. Nominal size: New brick shall match the custom size, shape, texture and color range of adjoining brick..
   3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

B. Existing Salvaged Facing Brick:
   1. Reuse existing brick salvaged from demolition.
      a. Reuse unbroken units.

2.03 STONE

A. Slate
   1. Hard, non-absorbent, sound blue/black Pennsylvania slate.
      a. Manufactured and distributed by Williams & Sons, Slate and Tile, Inc. http://www.williamsslate.com/product.htm

B. Limestone: Indiana Oolitic Limestone; complying with ASTM C568/C568M Classification II - Medium Density.
   1. Grade: Standard, per ILI Handbook.
   2. Color: Gray, to match existing.
   3. Surface Texture: Match existing.
   4. Acceptable Producers:
      a. Indiana Limestone Company: www.indianalimestonecompany.com.

C. Bluestone: Quartz-based stone complying with the requirements of ASTM C 616, Classification II Quartzitic Sandstone.
   1. Stone Abrasion Resistance: Minimum value of 15, based on testing according to ASTM C 241.
   2. Finish: Thermal

D. Substitutions: See Section 01 6000 - Product Requirements.

2.04 **MORTAR AND GROUT MATERIALS**

A. Mortar: As specified in Section 04 0511.

B. Hydrated Lime: ASTM C207, Type S.

C. Grout Aggregate: ASTM C404.

2.05 FLASHINGS

A. Stainless Steel/Polymer Fabric Drainage Plane Flashing: ASTM A240/A240M stainless steel sheet bonded with rubber-based adhesive between one sheet of polymer fabric and one sheet of non-woven drainage material, with manufacturer's standard, self adhering, stainless steel lap tape.
   1. Manufacturers:
      a. York Manufacturing, Inc; Flash-Vent SS: www.yorkmfg.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

B. Factory-Fabricated Flashing Corners and Ends: Stainless steel.

2.06 ACCESSORIES

A. Joint Filler: Closed cell polyethylene; oversized 50 percent to joint width; self expanding; 3/4 inch wide x by maximum lengths available.

B. Weeps:
   1. Type: Polyester mesh.

C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 LINTELS

A. Prefabricated Steel Lintels: Refer to Section 05 5000 - Metal Fabrications for information.

2.08 MORTAR **AND GROUT MIXES**

A. Refer to Section 04 0126 - Masonry Restoration for mortar information.

B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

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

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.

D. Brick Units:
   1. Bond: Flemish bond above Main Building first floor line; 3 course common bond with Flemish headers below first floor line. Brick soldier course header above windows and service doors. Double rowlock course at north side of auditorium/gymnasium. Rowlock and soldier course above base at Annex Building.
   2. Coursing: Three units and three mortar joints to equal 8 inches.
   3. Mortar Joints: Match historic profile.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

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 wall tile is scheduled or resilient base is scheduled.

I. Isolate masonry partitions from vertical structural framing members with a control joint.

J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

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 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. Reinforce joint corners and intersections with strap anchors 16 inches on center.

F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

3.08 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.09 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 8 inches, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Extend metal flashings 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 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.10 LINTELS

A. Install loose steel lintels over openings.

B. Maintain minimum 6 to 8 inch bearing on each side of opening.

3.11 GROUTED COMPONENTS

A. Reinforce bond beams with 2, No. 4 bars, 1 inch from bottom web.

B. Lap splices minimum 24 bar diameters.

C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

D. Place and consolidate grout fill without displacing reinforcing.

E. 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 or expansion joints.

B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.

C. Size control joints as indicated on drawings; if not shown, 3/4 inch wide and deep.

3.13 TOLERANCES

A. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

B. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

C. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

3.14 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, and sleeves. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.15 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 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel and aluminum items.

B. Prefabricated ladders.

C. Ornimental cast light posts.

1.02 RELATED REQUIREMENTS

A. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.

B. Section 05 5100 - Metal Stairs.

1.03 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

H. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2012.

I. ASTM B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes (Metric); 2012.

J. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2012.

K. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); 2012.

L. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

M. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.

O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

P. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

Q. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 3000 - 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.

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. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Steel Floor Plate: ASTM A786/A786M; manufacturer's standard pattern.

F. Cross Bars: ASTM B211 (ASTM B211M) solid bars.

G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210 (ASTM B210M), 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211 (ASTM B211M), 6061 alloy, T6 temper.

2.03 ACCESSORIES

A. Fasteners and Saddle Clips: Galvanized steel:

2.04 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. 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.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

E. Fabricate grates and plates to accommodate design loads.
   1. Mechanically clinch joints of intersecting metal sections.
   2. Fabricate support framing for openings.
   3. Top Surface: Non-slip.

2.05 ROUGH HARDWARE

A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required.

B. Manufacture or fabricate items of sizes, shapes and dimension required.

2.06 FABRICATED ITEMS

A. Ornimental Cast Light Poles:
   1. Provide historically correct cast metal light poles at building entrance.
   2. Fabricator: Rambusch Lighting, 160 Cornelison Avenue, Jersey City, NJ 07304; Tel: (201)333-2525.
      a. Light poles based on historical documentation supplied to the fabricator.
      b. Globe and LED luminair shall be provided by fabricator, coordinated with electrical specifications.

B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

C. Lintels: As detailed; galvanized finish.

D. Key Angle:
   1. Where new masonry walls intersect existing and where shown on the drawings, provide 1-1/2" x 1-1/2" x 5/16" continuous steel angle for construction joints. Expansion bolt angle to masonry walls.

E. Angle support for vanity:
   1. Provide welded steel angle supports for vanities.
   2. Secure to walls by bolting or screwing into blocking in walls.
   3. Prepare for attachment of wood blocking and plastic laminate as specified elsewhere and shown on the drawings.

F. Elevator shaft hoist beam: Size per structural drawings.

G. Elevator sill angles:
   1. Provide 5" x 5" x 5/16" sill angles at each elevator entrance.
   2. Secure to floor structure and fill with grout as directed on the elevator shop drawings

H. Elevator pit ladder: Provide elevator pit ladder where shown on the drawings.
   1. Ladder shall extend a min. of 4'-0" above finished floor.
   2. Construct ladder of 1/2" x 2-1/2" structural steel flat bars spaced 1'-6" apart with 1" square solid rungs spaced a max. of 1'-0" apart.
      a. Fit rungs on centerline of side rails,
   3. Add brackets at top and bottom welded to rails and bolted to building structure.

I. Dunnage for roof top equipment: Provide as shown on the drawings steel pipe supports and framing for roof top mechanical equipment.

2.07 PREFABRICATED LADDERS

A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
   1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
   2. Materials: Aluminum; ASTM B221 (ASTM B221M), 6063 alloy, T52 temper.
   3. Finish: Mill finish aluminum.

4. Rungs: Not less than 1-1/4 inches (32 mm) in section and 18-3/8 inches (467mm) long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.
   a. Rungs shall withstand a 1,500 pound (454 kg) load without deformation or failure.
5. Channel Side Rails: Not less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide.
6. Walk-Through Rail and Roof Rail Extension: Not less than 3 feet 6 inches (1067 mm) above the landing and shall be fitted with deeply serrated, square, tubular grab rails.
7. Landing Platform: 1-1/2 inches (38 mm) or greater diameter, tubular aluminum guardrails and decks of serrated aluminum treads.
8. Manufacturers:
   a. O'Keeffe's Inc: Model 503: www.okeeffes.com/sle.

2.08 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete and items to be imbedded in masonry.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

2.09 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: MIll Finish.

2.10 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 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. Mechanically cut galvanized finish surfaces. Do not flame cut.

D. Anchor by bolting through saddle clips.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

END OF SECTION

SECTION 05 5213
PIPE, TUBE AND DECORATIVE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted handrails.

B. Stair railings and guardrails.

C. Free-standing railings at steps.

1.02 RELATED REQUIREMENTS

A. Section 05 5100 - Metal Stairs: Attachment plates for handrails specified in this section.

B. Section 06 2000 - Finish Carpentry: Wood handrail.

C. Section 09 2116 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.

D. Section 09 9000 - Painting and Coating: Paint finish.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.
   1. Provide an allowance of 100 linear feet of railing.
      a. This allowance includes purchase, delivery, and installation of railing with guard rail, pickets and handrail, in multiple locations, as directed by the Architect.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.
   2. Provide an allowance for replacement of existing railing at ramp and steps in kind at Room No. M117 - Student Commons.
      a. This allowance includes purchase, delivery, and installation of to replace in kind the existing railings, guard rails, pickets and handrais, at the existing ramp and steps in Room No. 117 - Stuent Commons.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing railing with guard rail, pickets and handrail, as specified in this section.
      a. Unit of measure: Per linear foot of railing installed.
   2. Unit price to replace in kind the existing railings, guard rails, pickets and handrais, at the existing ramp and steps in Room No. 117 - Stuent Commons.
      a. Unit of measure: Lump sum per item installed.

1.04 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

D. ASTM A167 - Standard Specification for stainless and heat resisting chromium nickel steel plate, sheet and strip.

E. ASTM A269 - Standard Specification for seamless and welded austenitic stainless steel tubing.

F. ASTM A276 - Standard Specification for stainless and heat resisting bars and shapes.

G. ASTM A312 - Standard Specification for seamless and welded austenitic stainless steel pipe.

H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

I. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

J. ASTM E894 - Standard Test Methods for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.

K. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.

L. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

M. AWS D1.1 - Structural Welding Code Steel.

N. AWS D1.6 - Structural Welding Code Stainless Steel.

O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

P. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

C. Product Data: Provide product data for rail system and finishes.

D. Welder Certifications.

E. Samples: Submit two, 12 inch long samples of handrail. Submit two samples of elbow, wall bracket, and end stop.

1.06 QUALITY ASSURANCE

A. Obtain railing through one source through a single manufacturer.

1.07 DELIVERY, STORAGE AND HANDLING

A. Materials to be delivered to site crated and packaged to prevent damage.

B. Store materials on site in manufacturer's unopened packaging until ready to install.

C. Store material in a clean, dry location, avoiding exposure to uncured concrete, masonry and acidic cleaning agents.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tube and Pipe Handrails and Railings:
   1. C.R. Laurence Company, Inc: www.crl-arch.com/sle.
   2. Tri-Tech, Inc.: www.tri-tech-inc.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Decorative Handrails and Railings:
   1. Julius Blum & Co., Inc.:www.juliusblum.com.

2.02 RAILINGS - GENERAL REQUIREMENTS

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

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 50 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.

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

D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: See drawings for configurations and heights.

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

G. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.03 STEEL RAILING SYSTEM

A. Stainless Steel:
   1. Pipe and tubing: ASTN A269, Type 304 or Type316.
   2. Bar: ASTM A276, Type 304 or Type316.
   3. Fittings: ASTM A276/A479, Type 304 or Type316.
   4. Finish: #4 (180 grit).

B. Steel Tube: ASTM A500/A500M, Grade B cold-formed structural tubing.

C. Decorative Rail: Stainless steel, Type 304.
   1. Model No. 6513 as manufactured by Julius Blum & Co., Inc.
   2. Fittings: Square End Piece, 6513-N.

D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

2.04 FABRICATION

A. Accurately form components in accordance with approved shop drawings and to suit specific project conditions and field dimensions for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by continuous welds without undercut and distortion of rail material. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by continuous welds without undercut and distortion of rail material.

3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.

F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 05 7500
DECORATIVE FORMED METAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior fabrications made of formed metal sheet, secondary supports, and anchors to structure, including:
   1. Closures, trim, and filler panels.
   2. Lighting coves.
   3. Pockets for window treatment.
   4. Perforated metal grilles.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for fifteen (15) gravity vent grilles to replace in-kind, matching existing grilles in classrooms.
      a. This allowance includes purchase, delivery, and installation of gravity vent grilles.
      b. This allowance shall be included as a separate line items and adjusted by a Unit Price.

B. Provide an allowance of $20,000 to fabricate and replace existing exterior crawl space ventilation grilles and frames and attic space grilles with hoods.
   1. This allowance includes purchase, delivery, and installation of grilles.
   2. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

C. Unit Prices:
   1. Unit price for providing gravity vent grilles.
      a. Unit of measure: Per each gravity vent grille installed.

1.04 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. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

C. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2016.

D. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2015.

E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

H. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2013.

I. ASTM E488/E488M - Standard Test Methods for Strength of Anchors in Concrete Elements; 2015.

J. ASTM F1941 - Standard Specification for Electrodeposited Coatings on Threaded Fasteners; 2010.

K. NAAMM AMP 500-06 - Metal Finishes Manual; 2006.

L. SSPC-SP 1 - Solvent Cleaning; 2015.

M. SSPC-SP 5 - White Metal Blast Cleaning; 2007.

1.05 SUBMITTALS

A. Product Data - Sheet Metal Material: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.

B. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Differentiate between shop and field fabrication.
   2. Indicate substrates and adjacent work with which the fabrications must be coordinated.
   3. Include large-scale details of anchorages and connecting elements.
   4. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches.

C. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, minimum size 12 inches square, representing actual product in color and texture.

E. Certificate: Certify that the work results of this section meet or exceed specified requirements.

F. Installer’s Qualifications.

G. Maintenance Data: Care of finishes and warranty requirements.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating products specified in this section.
   1. With not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section.
   1. With minimum 3 years of documented experience.
   2. Approved by fabricator.

C. Mock-Up: Provide a mock-up for evaluation of fabrication workmanship.
   1. Locate where directed.
   2. Provide products finished as specified.
   3. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
   1. Protect finishes by applying heavy duty removable plastic film during production.
   2. Package for protection against transportation damage.
   3. Provide markings to identify components consistently with drawings.
   4. Exercise care in unloading, storing and installing panels to prevent bending, warping, twisting and surface damage.

B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Store in well ventilated space out of direct sunlight.
   2. Protect from moisture and condensation with tarpaulins or other suitable weather tight covering installed to provide ventilation.
   3. Store at a slope to ensure positive drainage of any accumulated water.
   4. Do not store in any enclosed space where ambient temperature can exceed 120 degrees F.
   5. Avoid contact with any other materials that might cause staining, denting, or other surface damage.

PART 2 PRODUCTS

2.01 FORMED METAL FABRICATIONS - GENERAL

A. Shop Assembly: Preassemble items to greatest extent possible. Minimize field splices and field assembly. Disassemble only as necessary for transportation and handling. Mark items clearly for assembly and installation.

B. Coordination: Match dimensions and attachment of formed metal items to adjacent construction. Produce integrated assemblies. Closely fit joints; align edges and flat surfaces unless indicated otherwise.

C. Forming: Profiles indicated. Maximize lengths. Fold exposed edges to form hem indicated or ease edges to radius indicated with concealed stiffener. Provide flat, flush surfaces without cracking or grain separation at bends.

D. Reinforcement: Increase metal thickness; use concealed stiffeners, backing materials or both. Provide stretcher leveled standard of flatness and stiffness required to maintain flatness and hold adjacent items in flush alignment.

E. Anchors: Straps, plates and anchors as required to support and anchor items to adjacent construction.

F. Supports: Miscellaneous framing, mounting, clips, sleeves, fasteners and accessories required for installation.

G. Welding and Brazing: Weld or braze joints continuously. Grind, fill or dress to produce smooth, flush, exposed surfaces. Do not discolor metal. Grind smooth, polish, and restore damaged finishes to required condition.
   1. Ease exposed edges to small uniform radius.

2.02 FORMED METAL FABRICATIONS - SHEET METAL

A. Closures, Trim and Fill Panels:
   1. Form closures from type and thickness of metal indicated.
   2. Conceal fasteners when possible.
   3. Drill and tap holes for securing to other surfaces.
   4. Provide gaskets where indicated or needed for continuous seal at adjacent surfaces.

5. Miter or cope at corners and reinforce with bent metal plate. Form tight joints.

B. Lighting Coves: Form lighting coves from type and thickness of metal indicated. Provide cutouts for electrical wiring and fasteners. Coordinate size of coves, cutouts and anchoring system with lighting system shown on drawings.

C. Pockets for Window Treatment:
1. Form pockets from metal of type and thickness indicated. Coordinate dimensions and attachment method with window treatment, window frames, ceiling system and other adjacent construction.
2. Reinforce for attaching window treatment and hardware.
3. Divide continuous pockets with built in partitions. Separate adjoining drapery and blind units, align with window mullions and accommodate filler panel at ends of pocket.

D. Decorative Perforated Grilles:
1. Match existing decorative metal grilles at front of stage.
a. For pricing purposes provide plain steel, cold rolled, 16 gage, 3/8 inch squares on 1/2 inch centers, square hole row pattern, with 1 inch margin on all edges, cut to size.
b. Manufacturer: McNichols.
2. Fabricate to size based on field measurements. Coordinate with wood frames fabricated in Section 06 2000 - Finish Carpentry.

2.03 MATERIALS

A. General: Provide sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections exposed to view on finished units.

B. Aluminum Sheet: ASTM B209 or ASTM B209M, 5005-H32 minimum; alloy and temper recommended by aluminum producer and finisher for use and finish indicated.

C. Anchors, Clips and Accessories: Use one of the following:
1. Stainless steel complying with ASTM A276/A276M, ASTM A480/A480M, or ASTM A666.
2. Interior Locations: Carbon steel; zinc coated in accordance with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5.
3. Structural Anchors: Provide anchors where work is indicated to comply with design loads.
a. Type: Provide chemical or torque-controlled expansion anchors.
b. Capacity: When tested according to ASTM E488/E488M; four times the load imposed when installed in concrete.
4. Nonstructural Anchors: Provide metal expansion sleeve anchors where work is not indicated to comply with design loads. Provide size and number required for load, installation, and as recommended by manufacturer, unless indicated otherwise.

D. Fasteners, General: Same basic metal and alloy as formed metal sheet unless indicated otherwise. Do not use metals incompatible with the materials joined.

E. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 15 mil dry film thickness per coat.

F. Laminating Adhesive: Recommended by metal fabricator; fully bond metal to metal, prevent telegraphing and oil canning; compatible with substrate; noncombustible after curing. VOC contents calculated according to 40 CFR 59, Subpart D (EPA Method 24) listed below.

G. Isolation Coating: Manufacturer's standard epoxy coating.

2.04 PAINTS AND COATINGS

A. As specified in Section 09 9123.

2.05 FINISHES

A. Finishes, General: Comply with NAAMM AMP 500-06.
   1. Complete mechanical finishes before fabrication. After fabrication, finish joints, bends, abrasions and surface blemishes to match sheet.
   2. Protect mechanical finishes on exposed surfaces from damage.
   3. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.
   4. Appearance: Limit variations in appearance of adjacent to one-half the range represented in approved samples. Noticeable variations in the same piece are not acceptable. Install components within the range of approved samples to minimize contrast.

B. Aluminum Finishes:
   1. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
   2. Color: To be selected by Architect from manufacturer's custom range.

C. Steel Finishes:
   1. Surface Preparation: Comply with SSPC-SP 1 (solvent cleaning); remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust from uncoated steel; comply with SSPC-SP 5 (white metal blast cleaning).
   2. Pretreatment: Immediately after cleaning, apply a conversion coating of type suited to organic coating applied over it.
   3. Factory Prime: Apply shop primer to prepared surfaces of items where field painting after installation indicated, unless indicated otherwise..

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and interfaces with other work.

B. Verify substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturer's written instructions.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Notify Architect in writing of conditions detrimental to proper and timely completion of work. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent work areas and finish surfaces from damage during installation.

B. Coat concrete and masonry surfaces that will be in contact with metal surfaces with bituminous coating.

3.03 INSTALLATION - SHEET METAL FABRICATIONS

A. Locate and place decorative formed sheet metal items level and plumb; align with adjacent construction. Cut, drill and fit as required to install.

B. Do not cut or abrade sheet metal finishes that cannot be completely restored in the field. Return such items to manufacturer or fabricator for required alterations and refinishing or provide new items.

C. Use concealed anchorages where possible. Provide washers where needed on bolts or screws to protect metal surfaces and make weathertight connection.

D. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers indicated.

E. Decorative perforated metal grilles:
   1. Verify dimensions of frames.
   2. Install with exposed fasteners in pre-drilled holes, matching existing.
   3. Prepare for field painting.

3.04 CLEANING

A. Restore finishes damaged during installation and construction period. Return items that cannot be refinished in the field to manufacturer or fabricator. Refinish entire unit or provide new units.

B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.

C. Remove temporary coverings and protection of adjacent work areas.

D. Clean installed products in accordance with manufacturer's instructions.

3.05 PROTECTION

A. Protect installed products from damage during construction.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Non-structural dimension lumber framing.

C. Rough opening framing for doors, windows, and roof openings.

D. Sheathing.

E. Subflooring.

F. Roof-mounted curbs.

G. Roofing nailers.

H. Wood roof deck replacement.

I. Communications and electrical room mounting boards.

J. Concealed wood blocking, nailers, and supports.

K. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 07 7200 - Roof Accessories: Prefabricated roof curbs.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.

1. Provide an allowance of $50,000 for rough carpentry material and labor.

a. This allowance includes purchase, delivery, and installation of labor and material of rough carpentry, as directed by the Architect.

b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

1.04 REFERENCE STANDARDS

A. AFPA (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2012.

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; 2015.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

E. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.

F. PS 1 - Structural Plywood; 2009.

G. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.

H. PS 20 - American Softwood Lumber Standard; 2010.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

C. Structural Composite Lumber: Submit manufacturer's published structural data including span tables, marked to indicate which sizes and grades are being used; if structural composite lumber is being substituted for dimension lumber or timbers, submit grading agency structural tables marked for comparison.

D. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.06 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.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Southern Pine, unless otherwise indicated.
   2. 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.
   3. 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.
   4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

B. Lumber fabricated from old growth timber is not permitted.

C. Lumber salvaged from deconstruction or demolition of existing buildings or structures is permitted in lieu of sustainably harvested lumber provided it is clean, denailed, and free of paint and finish materials, and other contamination; identify source.
   1. Where salvaged lumber is used for structural applications, provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc; www.alsc.org.

D. Lumber fabricated from recovered timber (abandoned in transit) is permitted in lieu of sustainably harvested lumber, unless otherwise noted, provided it meets the specified requirements for new lumber and is free of contamination; identify source.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
   1. Species: Southern Pine.
   2. Grade: Select Structural.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 STRUCTURAL COMPOSITE LUMBER

A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.

B. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer.
   1. Beams: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 2,000,000 psi, minimum.
   2. Headers Not Longer Than 48 inches: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber.

2.04 CONSTRUCTION PANELS

A. Subflooring: Any PS 2 type, rated Sheathing.
   1. Bond Classification: Exterior.
   2. Span Rating: 48.
   3. Performance Category: 3/4 PERF CAT.

B. Underlayment: APA Underlayment; plywood, Exposure 2, 1/2 inch thick. Fully sanded faces at resilient flooring.

C. Roof Sheathing: Oriented strand board wood structural panel; PS 2.
   1. Grade: Structural 1 Sheathing.
   2. Bond Classification: Exposure 1.
   3. Performance Category: 5/8 PERF CAT.
   4. Span Rating: 40/20.
   5. Edges: Tongue and groove.
   6. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 500 days.
   7. Warranty: Manufacturer's standard lifetime limited warranty against manufacturing defects and that panels will not delaminate or require sanding due to moisture absorption damage from exposure to weather for up to the stated period.

D. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

E. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.05 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

B. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
   1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

C. Subfloor Glue: Waterproof, air cure type, cartridge dispensed.

D. Building Paper: Water resistant Kraft paper.

2.06 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

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 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength .

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA (WFCM) Wood Frame Construction Manual.

E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

G. Provide bridging at joists in excess of 8 feet span at mid-span. Fit solid blocking at ends of members.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Chalkboards and marker boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

C. Perimeter wood blocking shall be fastened with approved screw fasteners at 2'-0" on center in staggered rows with an offset of 1'-0".
   1. Provide fasteners at 1'-0" on center in each staggered row for 8'-0" from corners.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Subflooring: Glue and nail to framing; staples are not permitted.

B. Underlayment: Secure to subflooring with nails and glue.
   1. At locations where resilient flooring will be installed, fill and sand splits, gaps, and rough areas.
   2. Place building paper between floor underlayment and subflooring.

C. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1. At long edges provide solid edge blocking where joints occur between roof framing members.
   2. Nail panels to framing; staples are not permitted.

D. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.
   4. Size and Location: As indicated on drawings.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 7419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood paneling, casings and moldings.

C. Hardware and attachment accessories.

D. Wood framed tack boards.

E. Display case door system.

1. Including operable glass door panels and related hardware, hinges and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 08 1433 - Stile and Rail Wood Doors.

C. Section 08 5200 - Aluminum Clad Wood Windows.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.

1. Provide an allowance of $50,000 to provide labor and materials to refurbish the finish carpentry in the Memoribilia Room No. M107 and Memoribilia Support Room No. M109.
   a. This allowance includes purchase, delivery, and installation of material and labor for finish carpentry work to match existing, as directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.
2. Provide an allowance of $20,000 to provide labor and materials to refurbish, change and reconstruct the finish carpentry in the Instructional Lab Room No. M105, including but not kimited to changes to the music practice rooms and the vision panels.
   a. This allowance includes purchase, delivery, and installation of material and labor for finish carpentry work, as directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.
3. Provide an allowance of $50,000 to provide labor and materials for benches in the Multipurpose Room No. M001.
   a. This allowance includes purchase, delivery, and installation of material and labor for benches, as detailed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.
4. Provide an allowance of $150,000 to provide labor and materials for dispaly cases designed and located as directed by the Architect.
   a. This allowance includes purchase, delivery, and installation of material and labor for display cases to be designed and located as directed by the Architect.

b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

5. Provide an allowance of $50,000 to provide labor and materials for molding, trim, door frames with wiring coordination and other adjustments, window and vision panel framing adjustments.
   a. This allowance includes purchase, delivery, and installation of material and labor for molding, trim, door frames with wiring coordination and other adjustments, window and vision panel framing adjustments as detailed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.
6. Provide an allowance of $35,000 to provide labor and materials for rebuilding glass and wood partition between Reception Room No. M102 and Office Room No. M104.
   a. This allowance includes purchase, delivery, and installation of material and labor for rebuilding glass and wood partition wall as detailed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.
7. Provide an allowance of $5,000 to provide labor and materials for repairing wood mantel at fireplace in Faculty Room M016, prior to the base bid refinishing scope.
   a. This allowance includes purchase, delivery, and installation of material and labor for repairing wood mantel at fireplace in Faculty Room M016, as detailed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

1.04 REFERENCE STANDARDS

A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.

B. ANSI A208.1 - American National Standard for Particleboard; 2009.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2009.

E. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; 2011.

F. PS 1 - Structural Plywood; 2009.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide data on fire retardant treatment materials and application instructions.
   2. Provide instructions for display case door system installation.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

D. Samples: Submit two samples of finish plywood, 12 by 12 inch in size illustrating wood grain and specified finish.

E. Samples: Submit two samples of wood trim 12 inch long.

1.07 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.
   2. Single Source Responsibility: Provide and install this work from single fabricator.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Interior Woodwork Items:
   1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white oak; prepare for stained finish.

2.02 WOOD-BASED COMPONENTS

A. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000 - Product Requirements.

B. Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless indicated otherwise, and provided it is clean and free of contamination, identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc. (ALSC).

2.03 LUMBER MATERIALS

A. Hardwood Lumber: White Oak species, plain sawn, maximum moisture content of 6 percent; with flat grain, of quality suitable for transparent finish.
   1. Grading: In accordance with NHLA G-101 Grading Rules; www.natlhardwood.org.

2.04 SALVAGED MATERIAL

A. Remove and salvage existing Chestnut trim for reuse.

B. Coordinate removal and salvage with demolition and new construction scopes.

C. Salvaged trim to be reused in historically significant locations.

2.05 SHEET MATERIALS

A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

B. Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.
   1. Grading: Certified by the American Plywood Association.

C. Hardwood Plywood: Face species White Oak, plain sliced, book matched, medium density fiberboard core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1; glue type as recommended for application.

D. Particleboard: ANSI A208.1; Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

E. Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).

2.06 TACKBOARD MATERIAL

A. Composition cork.
   1. Cork Thickness: 1/4 inch (6 mm).
   2. Color: As selected from manufacturer's full range of 15 colors (min.).
   3. Backing: MDF, 3/4 inch thick, laminated to tack surface.
   4. Roll Width: 48 inches.
   5. Frame: Same type and finish as for custom benches.
   6. Frame Profile: As shown.
   7. Frame Finish: Stained.
   8. Product: Bulletin Board as manufactured by Forbo.

2.07 DISPLAY CASE DOOR MATERIALS

A. Operable glass door panels 3/8 inch thick safety glass laminated safety glass, mounted in steel C-channel with dual action hinge; with tight seal for dust control.
   1. Frameless construction with no intermediate vertical support.
   2. In the closed position, adjacent glass panels shall remain in one plane.
   3. Adjustable alignment pins shall assure that the glass is properly closed and positioned.
   4. Structural components shall not be visible, fasteners shall be concealed and locking is provided by means of pin tumbler cylinder locks.
      a. Metal finish is factory primed and painted with two-component polyurethane.
      b. Finished frame: White Oak, finish to match wood trim.
   5. Hinges: Dual actuated hinges manufactured from high-strength aircraft aluminum and requiring no lubrication.
      a. When unlocked the door panel releases from the compression seal and rotates out and away from the display space providing full access.
      b. The pivot end of the panel does not rotate into the display space.
   6. Manufacturer: Viewall ® by Helmut Guenschel Inc., 10 Emala Avenue, Baltimore, MD 21220. Tel 410-686-5900 Fax 410-687-9342 or equal.

2.08 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

2.09 WOOD TREATMENT

A. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.

B. Wood Preservative (Surface Application): Clear, _____ type, _____ manufactured by _____.

C. Provide identification on fire retardant treated material.

D. Redry wood after pressure treatment to maximum 10 percent moisture content.

2.10 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. 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 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

C. See Section 06 1000 - Rough Carpentry for installation of recessed wood blocking.

3.02 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

C. Install display case door system in accordance with manufacturer’s instructions.

D. Install hardware supplied by Section 08 7100 - Door Hardware in accordance with manufacturer's instructions.

3.03 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 9000 - Painting and Coating.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.05 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Cabinet hardware.

C. Preparation for site finishing.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting: Site finishing of cabinet exterior.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.

1. Provide an allowance of 200 lineal feet of wood base cabinet and countertop.
   a. This allowance includes purchase, delivery, and installation of material and labor for 200 lineal feet of wood base cabinet and countertop work, as specified in this section and designed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by a Unit Price.
2. Provide an allowance of 200 lineal feet of wood wall cabinets.
   a. This allowance includes purchase, delivery, and installation of material and labor for 200 lineal feet of wood wall cabinets work, as specified in this section and designed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by a Unit Price.
3. Provide an allowance of five (5) full-height wardrobe cabinets.
   a. This allowance includes purchase, delivery, and installation of five (5) full-height wardrobe cabinets., as specified in this section and designed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by a Unit Price.
4. Provide an allowance of $30,000 to provide labor and materials for miscellaneous cabinetry work.
   a. This allowance includes purchase, delivery, and installation of material and labor formiscellaneous cabinetry work, as detailed and directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

B. Unit Prices:

1. Unit price for providing wood base cabinet and countertop.
   a. Unit of measure: Linear foot of wood base cabinet and countertop installed.
2. Unit price for providing wood wall cabinets.
   a. Unit of measure: Linear foot of wood wall cabinets.
3. Unit price for providing full-height wardrobe cabinets.
   a. Unit of measure: One (1) full-height wardrobe cabinet.

1.04 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

E. Samples: Submit actual sample items of proposed hinges, shelf standards, and push latches, demonstrating hardware design, quality, and finish.

1.07 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.08 MOCK-UP

A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware and finishes.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.10 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Wood Veneer Faced Cabinet:

1. Exposed Surfaces: HPVA Grade A, White Oak, plain sliced, book-matched.
2. Semi-Exposed Surfaces: HPVA Grade A, White Oak, plain sliced, pleasing-matched.
3. Concealed Surfaces: HPVA Grade B, White Oak, plain sliced, random-matched.

C. Cabinets:

1. Finish - Exposed Exterior Surfaces: Wood.
2. Finish - Exposed Interior Surfaces: Wood.
3. Finish - Concealed Surfaces: Wood.

4. Grained Face Layout for Cabinet and Door Fronts: Style and Rail, all Grades.
   a. Drawer fronts run grain horizontally.
   b. Doors: Vertical grain.
5. Cabinet Design Series: As indicated on drawings.
6. Adjustable Shelf Loading: 50 lbs. per sq. ft.
   a. Deflection: l/360.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 COUNTERTOPS

A. Solid Surface Countertops: Specified in Section 12 3600.

2.04 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Fasteners: Size and type to suit application.

C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

D. Concealed Joint Fasteners: Threaded steel.

2.05 HARDWARE

A. Catches: Touch type.
   1. Product: Magnetic Latch 20125LP manufactured by Saint Louis Design.

B. Hinges: Butt type, powder coated black.
   1. Manufacturers:
      a. Hafele America Co.; Five knuckle hinge, Grade 1.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.06 SITE FINISHING MATERIALS

A. Stain and Finishing Materials: As required by AWI/AWMAC/WI Architectural Woodwork Standards (AWS).

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
   1. Provide balance matchedpanels at each elevation.
   2. Provide sequence matching across each elevation.

2.08 SHOP FINISHING

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:

a. System - 11, Polyurethane, Catalyzed.
b. Sheen: Satin.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

B. Use concealed joint fasteners to align and secure adjoining cabinet units.

C. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

D. Secure cabinets to floor using appropriate angles and anchorages.

E. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 07 1800
COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Application of fluid-applied waterproofing to masonry surfaces as indicated.

1.02 RELATED WORK

A. Section 04 0126 - Masonry Restoration

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for 100 square feet of fluid-applied waterproofing.
      a. This allowance includes purchase, delivery, and installation of the complete fluid-applied waterproofing system, including surface preparation, base and saturation coat, flashing fabric, field fabric, and finish coat in the specified color.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing fluid-applied waterproofing.
      a. Unit of measure: Square foot of fluid-applied waterproofing installed.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's product literature for fluid-applied waterproofing. Manufacturer's product literature shall include standard warranty, instructions for application and use.

B. Manufacturer's color samples for selection by the Architect.
   1. Samples shall include the full range of available colors.
   2. Custom color samples required to match historic material.

1.05 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference with the Owner, Contractor, Architect and manufacturer's representative at the project site prior to beginning product application. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.

B. Coordinate application of waterproofing with other trades affected by the work of this Section including, but not necessarily limited to, masonry cleaning, masonry restoration and roofing.

C. Access to work areas is from the exterior only. Under no circumstances are materials or equipment to be transported through the building.

D. Coordinate work schedule with the Owner's representative to ensure timely notification of building occupants prior to beginning work.

1.07 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which waterproofing manufacturer and Installer agree to repair or replace waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

B. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 FLUID-APPLIED WATERPROOFING

A. The following specification is based on materials manufactured by Sealoflex Inc., Charleston, SC. Equivalent products of the following manufacturers may also be acceptable:
   1. Sika Corporation
   2. AcryMax
   3. Architect-approved equivalent

B. Waterproofing Material: Sealoflex three-stage, fabric reinforced, flexible, acrylic coating; liquid applied in successive stages to form one continuous, seamless watertight membrane; 45 mil minimum cured total system thickness; comprised of the following:
   1. Base and Saturation Coat: Sealoflex Pink, Flexible water based acrylic emulsion coating
   2. Flashing Fabric: 4”, 6”, 12”, 20” Sealoflex Fabric Polyester, non-woven, stitch bonded and heat set fabric
   3. Field Fabric: 40” Sealoflex Fabric Polyester, non-woven, stitch bonded and heat set fabric
   4. Finish Coat: Sealoflex Finish Coat Ultraviolet light resistant blend of highly flexible water based acrylic co-polymer resin coating.
   5. Assume a custom color will be required in lieu of manufacturer’s standard palette.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Complete restoration of masonry components and surfaces to receive waterproofing prior to membrane application.

B. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, smooth, dust-free, and dry substrate for waterproofing application.

C. Mask off adjoining surfaces not receiving waterproofing to prevent spillage affecting other construction.

D. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, and other voids.

3.02 APPLICATION

A. Apply first coat of waterproofing, embed membrane-reinforcing fabric, and apply second coat of waterproofing to completely saturate reinforcing fabric and to obtain a seamless reinforced membrane free of entrapped gases, with an average dry film total thickness of 80 mils.
   1. Neatly miter or otherwise cut fabric at corners and penetrations to prevent bunching or excessive membrane thickness. Fabric should lie flat with no wrinkles. Stop fabric reinforcing approximately 1 inch short of membrane termination.

B. Turn up and extend membrane coating a minimum distance of 3 inches onto perpendicular surfaces adjoining substrate according to ASTM C 898 and manufacturer’s instructions.

C. Turn down and extend membrane coating down the front edge of projecting cornice to shed water away from profiled surface below.

3.03 CURING, PROTECTION, AND CLEANING

A. Cure waterproofing according to manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at perimeter foundation wall.

B. Batt insulation for filling perimeter window and door shim spaces, crevices in exterior wall and roof, and acoustical partitions.

1.02 RELATED REQUIREMENTS

A. Section 07 5300 - Elastomeric Membrane Roofing: Insulation specified as part of roofing system.

B. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2015a.

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; 2015a.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

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

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation at Perimeter of Foundation: Expanded polystyrene board.

2.02 FOAM BOARD INSULATION MATERIALS

A. Expanded Polystyrene (EPS) Board Insulation: ASTM C578, Type XI; with the following characteristics:
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

B. 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. Thermal Conductivity (k factor) at 25 degrees F: 0.18.

7. Compressive Resistance: 25 psi.
8. Manufacturers:
   a. Dow Chemical Company; _____: www.dow.com.
   b. Owens Corning Corp: www.owenscorning.com.

C. Insulation Type 2: See Section 07 26 40: Spray Polyurethane Foam.

2.03 BATT INSULATION MATERIALS

A. Insulation Type 3: 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. Thermal Resistance: R-value of ____.
   3. Thickness: As shown.
   4. Facing: Type 3 - Unfaced.
   5. Manufacturers:
      a. CertainTeed Corporation; _____: www.certainteed.com.
      b. Johns Manville; _____: www.jm.com.
      c. Owens Corning Corp: www.owenscorning.com.

B. Insulation Type 4: Foil-Faced Glass Fiber Batt Insulation (Not Used)

C. Insulation Type 5: 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. Acoustical Insulation.
   2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
   3. Thickness: As shown.
   4. Manufacturers:
      a. Thermafiber, Inc: www.thermafiber.com.
      b. ROXUL, Inc; ComfortBatt: www.rspec.com.
      c. ROXUL, Inc; Roxul AFB: www.rspec.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

D. 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. Where indicated, provide foil facing on one side; with flame spread index of 25 or less, when tested in accordance with ASTM E84.
   3. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
   4. Thickness: as shown or 4 inch.

E. Insulation Type 7: See Section 07 53 00: Elastomeric Membrane Roofing: Roof Insulation..

2.04 ACCESSORIES

A. 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 2616
UNDER-SLAB VAPOR BARRIER/RETARDER

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. 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 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for 200 square feet of under-slab vapor barrier/retarder.
      a. This allowance includes purchase, delivery, and installation of the complete vapor barrier/retarder system, including seam tape, mastic, 2 pipe boots, and detail strips.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing under-slab vapor barrier/retarder.
      a. Unit of measure: Square foot of under-slab vapor barrier/retarder installed.

1.04 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

1.05 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
         2) ASTM E 1745 Class A (Plastics), paragraph 7.1.2-5.

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 2640

SPRAY POLYURETHANE FOAM INSULATING AIR BARRIER

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. 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. Openings and penetrations of window frames.
      d. Barrier envelope systems.
      e. Door frames.
      f. Piping, conduit, duct and similar penetrations
      g. Masonry ties, screws, bolts and similar penetrations.
      h. All other air leakage pathways in the building envelope.

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 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for 1,000 square feet of spray polyurethane foam insulating air barrier.
      a. This allowance includes purchase, delivery, and installation of the complete pray polyurethane foam insulating air barrier system.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing under-slab vapor barrier/retarder.
      a. Unit of measure: Square foot of spray polyurethane foam insulating air barrier installed.

1.04 RELATED SECTIONS

A. Section 04 20 00 - Unit Masonry:

B. Section 07 21 00 - Building Insulation.

C. Section 07 92 00 - Joint Sealants: Joint sealant materials and installation.

D. Section 08 11 13- Door frames.

E. Section 08 5200 - Aluminum Clad Wood Windows

1.05 PERFORMANCE REQUIREMENTS

A. Provide air/vapor barrier system constructed to perform as follows:
   1. A continuous air/vapor barrier system.
   2. Building thermal insulation.

B. 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.

C. Maximum Permissible Air Leakage Rates cfm/sf @ 0.3" w.g. (l/s.m2 @ 75 Pa)
   1. 0.02 (0.1)

1.06 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. 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.
   10. Provide evidence of testing by an accredited laboratory confirming material has been tested and conforms to the requirements of NFPA 285: Pass.
   11. 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.

1.07 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.

1.08 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.

1.09 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.

1.10 WASTE MANAGEMENT AND DISPOSAL

A. Place materials defined as hazardous or toxic waste in designated containers.

B. Ensure emptied containers are sealed and stored safely for disposal away from children.

1.11 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.

1.12 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).

2.02 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. Sheet Membrane Transition Strip Termination Sealant:
      a. BES 925 Sealant by Henry Company Inc.
   6. Sheet Membrane Sheet Membrane Air Barrier Perimeter Seal to Windows, Doors: 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.
   7. Provide sealants in accordance with Section 07 92 00 - Joint Sealants. Comply with ASTM C920 and ASTM C920 classifications for type, grade, class, and uses.
      a. Silicone Sealant: 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
      b. SPF (Sprayed Polyurethane Foam) Sealant: Provide one- or two-component, foamed-in-place, polyurethane foam sealant with the following characteristics:
         1) Density: 1.5 to 2.0 PCF.
         2) Flame Spread (ASTM E162): 25 or less.
         3) Initial R-Value (at 1 inch): Not less than 7.
         4) Acceptable materials:
            (a) Zerodraft Foam Sealant.

(b) 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

c. 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 5300
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Elastomeric roofing membrane, adhered conventional application.

B. Insulation, flat and tapered.

C. Deck sheathing.

D. Cover sheathing.

E. Flashings.

F. Roofing stack boots and walkway pads.

1.02 ALTERNATES

A. Refer to Section 01 2300 - Alternates, for description of work under this Section affected by alternates.

1.03 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers and curbs.

B. Section 22 1006 - Plumbing Piping Specialties: Roof drains.

1.04 REFERENCE STANDARDS

A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.

B. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2013.

C. FM DS 1-28 - Wind Design; 2007.

D. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; Fifth Edition, with interim updates.

E. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.05 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.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, and fasteners.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and as a minimum, the following:

1. Outline of roof and size
2. Deck type (for multiple deck types).
3. Location and type of all penetrations.
4. Perimeter and penetration details.
5. Key plan (on multiple roof areas) with roof heights indicated.

6. Sheet width and number of perimeter sheets for Reinforced Mechanically Fastened systems
7. Fastener type, length and maximum spacing (for membrane securement) for Reinforced Mechanically Fastened systems.

D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

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

F. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

H. Pullout Test Results: Test report confirming the results meet or exceed the requirements of the manufacturer's withdrawal resistance criteria.

1.07 QUALITY ASSURANCE

A. Perform work in accordance with NRCA ML104 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.

1.08 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.

1.09 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.10 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Provide twenty year manufacturer's material and labor warranty to cover failure to prevent penetration of water.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. EPDM Membrane Materials:
1. Carlisle Roofing Systems, Inc; Sure-Seal EPDM: www.carlisle-syntec.com.
2. Firestone Building Products, LLC; _____: www.firestonebpco.com.

B. Insulation:
1. Carlisle SynTec.

2. Firestone Building Products Co.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROOFING

A. Elastomeric Membrane Roofing: One ply membrane, fully adhered, over insulation.

B. Roofing Assembly Requirements:
1. Roof Covering External Fire Resistance Classification: UL (DIR) certified Class A.

C. Acceptable Insulation Types - Constant Thickness Application: Any of the types specified.
1. Minimum 2 layers of polyisocyanurate board.
a. Bottom Layer: 1-1/2 inch thick board with R-value = 8.6
b. Top Layer: 2 inch thick board with R-value = 11.4

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: Ethylene-propylene-diene-terpolymer (EPDM); externally reinforced with fabric; complying with minimum properties of ASTM D4637/D4637M.
1. Thickness: 0.090 inch.
2. Sheet Width: 76 inch, minimum; factory-fabricate into largest sheets possible.
3. Color: Black.

B. Seaming Materials: Factory installed seam tape on one edge, as manufactured by membrane manufacturer .

C. Flexible Flashing Material: Same material as membrane; conforming to the following:
1. Tensile Strength: 1,200 psi.
2. Elasticity: 50 percent with full recovery without set.
3. Color: Black.

2.04 COVER BOARDS

A. Gypsum-Based Cover Board: Non-combustible, water resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M, and with the following additional characteristics:
1. Size: 48 inches by 96 inches, nominal.
2. Thickness: As indicated elsewhere.
3. Surface Water Absorption: 2.5 g, maximum, when tested in accordance with ASTM C473.
4. Surface Burning Characteristics: Flame spread of 0, smoke developed of 0, when tested in accordance with ASTM E84.
5. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
6. UL Classified for use with UL "P" series roofing assemblies.
7. Factory Mutual approved for use with FM 1-90 rated roofing assemblies.
8. Mold Growth Resistance: Zero growth, when tested in accordance with ASTM D3273 for minimum of 4 weeks.
9. Pre-primed for better adhesion.
10. Acceptable Products:
a. Georgia-Pacific DensDeck Prime Roof Guard.
b. Securock Gypsum-Fiber Roof Board

2.05 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 by 96 inch.
3. Flat Board minimum thickness: 1-1/2 inch for bottom layer, 2 inch for top layer, for a total thickness of 3-1/2 inches.
4. Tapered Board: Slope 1/4 inch per foot as indicated; minimum thickness 1/4 inch at leading edge; fabricate of fewest layers possible.
5. Thermal Resistance: R-value of 5.7.
6. Board Edges: Square.
7. Product: HP-H Polyiso Insulation.
8. Manufacturers:
   a. Carlisle SynTec.

2.06 ACCESSORIES

A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

B. Pre-Cut Tapered Insulation:
   1. Manufacturers:
      a. Atlas Roofing Corporation; Gemini Pre-Cut Crickets, Gemini One-Piece Drain Set, Gemini One-Piece Miter, and Gemini Tapered Edge Strip: www.atlasroofing.com.

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.
   1. Length as required for thickness of insulation material and penetration of deck substrate, with metal or polymer fastening plate, as approved by manufacturer.

E. Membrane Adhesive: As recommended by membrane manufacturer.

F. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.

G. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

H. Sealants: As recommended by membrane manufacturer.

I. Walkway Pads: Suitable for maintenance traffic, visually distinctive from roof membrane.
   1. Composition: Roofing membrane manufacturer's standard.
   2. Size: 18 by 18 inch.
   3. Surface Color: Black.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify surface is supported and secure.

C. Verify surface is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify surface is dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.

B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

3.03 VAPOR RETARDER AND **INSULATION - UNDER MEMBRANE**

A. Attachment of Insulation:
   1. Mechanically fasten first 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. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

D. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.

E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

F. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

G. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.

H. 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 rate recommended by the manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches (75 mm) of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Overlap edges and ends and seal seams by contact adhesive or factory applied seam tape, 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 8 inches onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to termination bar.
   3. Fully adhere flexible flashing over membrane and up to nailing strips.
   4. Secure flashing undertermination bar at 12 inches on center, or as recommended by manufacturer.

F. Around roof penetrations, seal flanges and flashings with flexible flashing.

G. Coordinate installation of roof drains and related flashings.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - 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. 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.

B. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

A. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, downspouts, and other items indicated in Schedule.

B. Combination flashing, mortar deflection, and weep as complete one step system.

C. Sealants for joints within sheet metal fabrications.

D. Reglets and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.

B. Section 075300 - Elastomeric Membrane Roofing.

C. Section 07 9005 - Joint Sealers.

D. Div 23: Flashing sleeves and collars for mechanical items protruding through roofing membrane.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.

1. Provide an allowance of $10,000 to provide labor and materials to refurbish the finish carpentry in the Memoribilia Room No. M107 and Memoribilia Support Room No. M109.

a. This allowance includes purchase, delivery, and installation of material and labor for miscellaneous sheet metal and flashing work, as designed and directed by the Architect.

b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

1.04 REFERENCE STANDARDS

A. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

B. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2012).

C. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).

D. CDA A4050 - Copper in Architecture - Handbook; current edition.

E. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

F. Industry standards:

1. BIA Technical Notes on Brick Construction No. 7, Water Penetration Resistance- Design and Detailing, August 2005.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product data: Indicate material type, composition, thickness, and installation procedures.

C. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

D. Samples: Submit two samples 6 x 6 inch in size illustrating metal finish color.

E. Product Quality & Environmental submittals:
   1. Certificates:
      a. Indicate materials supplied or installed are asbestos free.
      b. Indicate recycled content: a minimum of 60% total recycled material; based on 60% Post Industrial Recycled Content.
   2. Critical Performance Attributes:
      a. Tensile Strength, stainless steel 100,000 psi average
      b. Puncture Resistant, stainless steel 2,500 psi average
      c. When tested as manufactured, product resists growth of mold pursuant to test method ASTM D 3273.
      d. Fire Rating: flame spread and smoke generation
         1) Rated Class A, ASTM E84
      e. Certify the use of domestic manufactured stainless steel for flashing.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Qualifications:
   1. Manufacturer: Provide flashing materials by single manufacturer with not less than twenty five years of experience in manufacturing flexible flashing products.

1.07 PRE-INSTALLATION MEETING

A. Convene one week prior to starting the work of this Section.

1.08 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.

1.09 WARRANTY

A. Special warranty:
   1. Manufacturer: Warrant flexible flashing/drainage system material for life of the wall.
   2. Begin warranty at Date of Substantial Completion.

PART 2 PRODUCTS

2.01 FLASHING TYPES

A. Flashing Type 1: 2 piece interlocking type:
   1. Terne coated stainless steel; 0.015 inch (0.38 mm) thick; stainless steel complying with ASTM A666, Type 304; coated both sides with terne alloy at 0.092 lb/sq ft (450 g/sq m).
   2. Thickness and Weight: 20 gauge-0.04 inch (1 mm).
   3. Standard Finish: Type 2, prePATINA Graphite Grey.
   4. Manufacturer: RHEINZINK America, Inc.
   5. Configurations shall be as shown on drawings.

6. Where cap flashings or counter flashings occur, they shall be of two-piece construction with a receiver having a special vertical locking slot that requires no malleting or bending to hold the insert member in place.
7. Keyed or corrugated flashings are unacceptable.
8. Fasteners, solder for sealing and attachment, etc., shall be as recommended by the manufacturer.

B. Flashing Type 2: Masonry thru-wall type: NOT USED

C. Flashing Type 3: Membrane roofing base flashing material as specified in Section 075300 Elastomeric Membrane Roofing.

D. Flashing Type 4: Formed metal flashing (other than Type 1): Exposed metal flashing.
1. Terne coated stainless steel; 0.015 inch (0.38 mm) thick; stainless steel complying with ASTM A666, Type 304; coated both sides with terne alloy at 0.092 lb/sq ft (450 g/sq m).

E. Flashing Type 4A: Stainless steel core flexible flashing with drainage fabric:
1. Product standard of quality: York Manufacturing, Inc.; York Flash-Vent SS,
2. Accepted products:
   a. York Manufacturing, Inc.; York Flash-Vent SS, (www.yorkmfg.com)
   b. STS Coatings, Inc.; Wall Guardian TWF Stainless Steel (www.stscoatings.com)
   c. Building Materials West Company, Inc.; Evacu-Flash SS (www.evacu-flash.com)
   d. Other flashings that meet the requirements in section 1.04.C
3. Characteristics:
   a. Type: Engineered system, with high resistant to damage, composite with a stainless steel with non-asphalt adhesive polymer fabric laminated to one stainless steel and non-woven drainage fabric laminated to opposing face with non-asphalt adhesive.
   b. Stainless steel: ASTM A240
   c. Fabrics:
      1) Polymer fabric; laminated back face to stainless steel core
      2) Non-woven drainage fabric: Fabric laminated to front face stainless steel core.
   d. Recycled content: stainless steel is 60% recycled
      1) Size: Manufacturer's standard width rolls.

2.02 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal .

B. Slip Sheet: Rosin sized building paper.

C. Protective Backing Paint: Asphaltic mastic, ASTM D 4479 Type I.

D. Mastic/sealant: Product standard of quality is York Manufacturing, Inc.; UniverSeal US100.
1. Characteristics:
   a. Type: One part 100% solids, solvent-free formulated silyl-terminated polyether (STPE), ASTM C920-11, Type S, Grade NS, Class 50.

E. Outside corner and inside corner material; manufacturer’s standard available units using:
1. Stainless steel: 26 gauge stainless steel.

F. End dam: Product may be folded in line with the flashing material or utilize preformed end dams by manufacturer using:
1. Stainless steel: 26 gauge stainless steel

G. Splice material: Product standard of quality is York 304 by York Manufacturering, standard self-adhered metal material; material matching system material or use York Manufacturing’s Multi-Flash Stainless Steel lap piece and polyether sealant as a splice.

H. Termination bar: Product standard of quality is York T-96 termination bar.
   1. Manufacturer's standard 1 inch composite material bar.

I. Repair and other materials/accessories: Manufacturer's standard.

J. Fasteners: Domestic manufactured fastener types and sizes recommended by flashing manufacturer for intended use.

K. Plastic Cement: ASTM D4586/D4586M, Type I.

L. Solder: ASTM B32; Sn50 (50/50) type.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet, interlocking with sheet.

C. Form pieces in longest possible lengths.

D. Hem exposed edges on underside 1/2 inch; miter and seam corners.

E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

F. Tin edges of metal sheet to be soldered. Solder shop formed metal joints. After soldering, remove flux. Wipe and wash solder joints clean. Weather seal joints.

G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

H. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

2.04 DOWNSPOUT FABRICATION

A. Downspouts: Rectangular profile.
   1. Pre-Finished Aluminum: ASTM B 209 (ASTM B 209M); 0.032 inch (0.8 mm) thick; plain finish shop pre coated with fluoropolymer coating of color as selected.
   2. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; custom color as scheduled.

B. Gutters and Downspouts: Size indicated.

C. Accessories: Profiled to suit downspouts.
   1. Anchorage Devices: In accordance with SMACNA requirements.
   2. Downspout Supports: Brackets.
   3. Conductor Boxes: Fabricated, pre-finished aluminum ASTM B 209 (ASTM B 209M); 0.063 inch thick, plain finish, shop pre-coated with fluoropolymer coating of custom color as selected.

D. Downspout Boots: Cast iron. Refer to Section 055000 - Metal Fabrications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Conform to drawing details and to the following:
   1. SMACNA Architectural Sheet Metal Manual,

B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Fasten cavity wall flashings to stud back-up with a non-corrosive termination bar and seal the top edge of the flashing with sealant.

E. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

F. Concealed Flashing Type 4A:
   1. Install where indicated, specified, or required in accord with flashing manufacturer's written instructions and as follows.
      a. Prohibited practice: Tucking the flashing into the backer wall.
      b. Prohibited practice: Bonding or splicing to non-woven drainage fabric.
   2. Extend flashing 6" minimum, beyond opening, each side without stretching flashing material.
   3. Flashing width: Width required starting 1.5 inches to the exterior of the outside face of exterior wythe, extending through cavity, rising height required to extend above lintel steel at least 2 inches.
      a. After inspection by the Architect, cut flush with the leading edge of the brick.
   4. Splice end joints by butting ends together over 4” wide piece of self-adhering stainless steel flashing.
      a. The self-adhering stainless steel flashing should be sealed metal face down on to the substrate with sealant.
      b. Remove the release linear and butt the two pieces of flashing together and embed them into the splice sealant.
      c. Seal the butt seam with sealant.
   5. Masonry back up:
      a. Surface mount flashing after damp proofing installation specified in Damp Proofing Section in accord with manufacturer’s installation instructions.
      b. Apply flashing with drainage surface to outside.
      c. Fasten to masonry back-up surface at top by embedding in layer of sealant and use a termination bar to fasten to the backer wall and seal the top of the termination bar with sealant.
   6. Confirm compatibility with manufacturer’s mutual letters for components in contact.
   7. Lay flashing in continuous bead of sealant on masonry or supporting steel.
   8. Fold ends of flashing to form end dam; seal with sealant or utilize preformed end dams from manufacturer.
   9. Inside and outside corners: Use preformed corners from manufacturer.
   10. Do not cover drainage fabric with air barrier.
   11. Protect flashing from damage from trades, the environment and falling debris.

G. Secure gutters and downspouts in place using concealed fasteners.

H. Connect downspouts to downspout boots. Grout connection watertight.

3.04 SCHEDULE

A. Sheet metal Flashing Schedule
   1. Type 1: NOT USED
   2. Type 2: NOT USED
   3. Type 3: Membrane Roof Flashings - Refer to Section 07530 Modified Bituminous Membrane Roofing.
   4. Type 4: Terne coated stainless steel formed metal flashing:
      a. Exposed locations where indicated.
   5. Type 4A: Concealed thru-wall stainless steel core flexible flashing with drainage fabric:
      a. Concealed locations and as follows:
         1) Exterior door heads.
         2) Window heads and sills.
         3) Horizontal control joints.
         4) Changes in veneer materials, vertically.
         5) Other wall openings.
         6) Other locations indicated.

END OF SECTION

SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured curbs, equipment rails, and pedestals.

B. Smoke vents, automatic operation.

1.02 RELATED REQUIREMENTS

A. Section 07 5300 - Elastomeric Membrane Roofing.

B. Section 07 9200 - Joint Sealants.

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; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - 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.
   5. For smoke hatches, submit evidence of approval by evaluation agency specified.

C. Shop Drawings: Submit detailed layout developed for this project. Show dimensioned location and number for each type of roof accessory.
   1. Non-penetrating Rooftop Supports: Submit design calculations for loadings and spacings.

D. Certificate: For smoke hatches, provide certificate of approval from authority having jurisdiction.

E. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
   3. Submit documentation that roof accessories accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. OSHA 29 CFR 1910.23 Guarding floor and wall openings and holes
   2. OSHA 29 CFR 1926.502 Fall protection systems criteria
   3. International Building Code for venting requirements
   4. IBC Section 410 for Stages and Platforms
   5. IBC Section 1207 Sound Transmission
   6. Underwriters Laboratories Inc., UL 793 Listed for Heat and Smoke Vents
   7. Reference NFPA 204 for general maintenance of Heat and Smoke vents.
   8. ASTM E 90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
   9. ASTM E 1332 Standard Classification for Rating Outdoor-Indoor Sound Attenuation

B. Qualifications:
   1. Manufacturer/Installer: Company specializing in manufacturing and installation of components specified in this Section with minimum of 5 years documented experience.

1.06 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.

C. Exercise care in handling of Work so as not to disrupt finished surfaces.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

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. Sheet Metal: Hot-dip zinc coated steel sheet complying with ASTM A653/A653M, SS Grade 33 ; G90 coating designation; 18 gage, 0.048 inch thick.
   2. Manufacture curb bottom and mounting flanges for installation directly on roof deck, not on insulation; match slope and configuration of roof deck.
   3. Provide the layouts and configurations shown on the drawings.

B. Equipment Rails: Two-sided curbs in straight lengths, with top horizontal for equipment mounting.
   1. Provide preservative treated wood nailers along top of rails.
   2. Height Above Finished Roof Surface: 8 inches, minimum.
   3. Height Above Roof Deck: 14 inches, minimum.

2.02 SMOKE VENTS, AUTOMATIC OPERATION

A. Manufacturers - Smoke and Heat Vents:
   1. Babcock-Davis: www.babcockdavis.com.
   2. Bilco Company: www.bilco.com/sle.
   3. Nystrom, Inc: www.nystrom.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. HEAT AND SMOKE VENTS
   1. Hatch-Type Heat and Smoke Vents: Manufacturer's standard, with double walled insulated curbs, welded and sealed corner joints, integral condensation gutter, and cap flashing. Fabricate with insulated double-walled lid and continuous weathertight perimeter lid gaskets, and equip with automatic self-lifting mechanisms and UL-listed fusible links coordinated with rating for automated sprinkler system heads.
   2. Basis-of-Design Product: Subject to compliance with requirements, provide Babcock-Davis, Inc.; AcousticMAX 50, Model BSVY.
   3. Type and Size: SafeMAX metal lids used in all smoke venting applications, BSV.
   4. Certification: Smoke vent to have official UL label for testing to UL 793 Smoke and Heat Vents.
   5. Performance:

a. Loads: 40-lbf/sq. ft. (1.9-kPa) live load with a maximum deflection of 1/150th of the span. 90 lbf/sq. (4.3 kPa) double door wind uplift.
b. When release is actuated lid shall open against 10 lbf/sq. (0.5 kPa) snow load.

6. Door Options:
   a. Double Door: Size as indicated on Drawings.
7. Hatch Material:
   a. Cover: 14 gage (1.9 mm) galvanneal steel.
   b. Cover Insulation: 2 inch (50 mm) Polyisocyanurate insulation
   c. Curb/Frame: 14 gage (1.9 mm) galvanneal steel. 12 inch (305 mm) high curb above finish roof surface with integral counterflashing. Continuous 3.5 inch (89 mm) mounting flange with 5/8 inch (16 mm) mounting holes
   d. Curb Insulation: 2 inch (50 mm) rigid Polyisocyanurate insulation
8. Finish: High Reflectance White powder coat steel.
9. Latch: Positive hold zinc plated steel rotary latch assembly. Upon latch releases, vent covers are closed manually at rooftop level.
   a. Latch released manually via internal and external pull handles with cables.
10. Latch released automatically by UL 33 listed fusible melt-out link at temperature rated for specific area hazard, coordinated with fire protection system.
11. Springs: Gas spring with integrated damper.
12. Hinge: Pintle type with stainless steel hinge pin.
13. Hold Open Device: Automatic hold open arm with red vinyl grip handle release.
14. Weather Stripping: Extruded EPDM adhesive backed gasket seal continuous around perimeter of cover.

C. Accessories.
   1. Fall Protection Security Mesh: 3/16 inch (4.8 mm) diameter steel rod, 4 inch (102 mm) by 4 inch (102 mm) spacing, securely attached to inside of curb.
   2. Latch release connected to fire alarm system.

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.

B. Coordinate installation of components of this Section with installation of additional structure, roofing membrane, and base flashing.

C. Coordinate installation of sealant with Work of this Section to ensure water tightness.

D. Securely anchor roof accessories in compliance with manufacturer's instructions.

E. Set units plumb, level, and true to line without warp or rack. Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation

3.04 FIELD QUALITY CONTROL

A. Smoke Vent Testing: Test for proper operation after installation by all operational methods:
   1. Melting fusible link for inside at smoke vent level. Replace fusible link, then close vents from the exterior at the roof top level.
   2. Open the vents using an electrical signal for fire alarm, then close vent from the exterior at the roof top level.

B. Do not paint the internal mechanisms, especially moving parts such as spring/dampers, rotary latches and especially the fusible links. Painting any of these components may damage the vents and will void the warranty.

3.05 ADJUSTING

A. Adjust movable parts for smooth operation.

B. Operational Units: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.06 CLEANING

A. Clean installed work to like-new condition.

3.07 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.

B. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.

C. Section 07 8400 - Firestopping: Firestopping sealants.

D. Section 07 9100 - Preformed Joint Seals: Precompressed foam, gaskets, and strip seals.

E. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.

F. Section 08 8000 - Glazing: Glazing sealants and accessories.

G. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

H. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.

1. Provide an allowance of $10,000 to provide material and labor for miscellaneous joint sealant work.

a. This allowance includes purchase, delivery, and installation of material and labor for miscellaneous joint sealant work, as directed by the Architect.

b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

1.04 REFERENCE STANDARDS

A. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015.

B. ASTM C834 - Standard Specification for Latex Sealants; 2010.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2000 (Reapproved 2011).

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

G. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2010.

H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2013.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

E. Sustainable Design Documentation: For sealants and primers, submit VOC content and emissions documentation as specified in Section 01 6116.

F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

G. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

H. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.
   2. Compatibility Testing: In accordance with ASTM C1087.
   3. Allow sufficient time for testing to avoid delaying the work.
   4. Deliver to manufacturer sufficient samples for testing.
   5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
   6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

E. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
   1. Identification of testing agency.
   2. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
      a. Test date.
      b. Copy of test method documents.
      c. Age of sealant upon date of testing.
      d. Test results, modeled after the sample form in the test method document.
      e. Indicate use of photographic record of test.

F. Field Adhesion Test Procedures:
   1. Allow sealants to fully cure as recommended by manufacturer before testing.
   2. Have a copy of the test method document available during tests.
   3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
   4. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
   5. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
   6. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

G. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
   1. Sample: At least 18 inch long.
   2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
   3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.

d. Openings below ledge angles in masonry.
e. Other joints indicated on drawings.

2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames and adjacent construction.
   b. Joints between hollow metal door frames and resilient flooring.
   c. Joints between dissimilar exposed materials, unless otherwise indicated.
   d. Other joints indicated on drawings.
3. Do not seal the following types of joints.
   a. Intentional weepholes in masonry.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.

B. Exterior Joints: Use nonsag non-staining silicone sealant, Type 1, unless otherwise indicated.
   1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing; Type 3.
   2. Joints in limestone coping and cornice: Polyurethane, Type 1A.

C. Interior Joints: Use nonsag Acrylic emulsion latex sealant, Type 2, unless otherwise indicated.
   1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant; Type 2.
   2. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; ; Type 6.

D. Definitions:
   1. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.
   2. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.02 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 01 6116.

B. Sealant Types Summary:
   1. Type 1: Non-Staining Silicone.
   2. Type 1A: Polyurethane.
   3. Type 2: Acrylic Emulsion Latex
   4. Type 3: Non-Curing Butyl Sealant
   5. Type 4: NOT USED
   6. Type 5: NOT USED
   7. Type 6: Mildew-Resistant Silicone Sealant

2.03 NONSAG JOINT SEALANTS

A. Type 1 - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Color: Custom color as selected by Architect.
   5. Cure Type: Single-component, neutral moisture curing.
   6. Manufacturers:

a. Dow Corning Corporation; 795 Silicone Building Sealant: www.dowcorning.com/construction/sle.
b. Pecora Corporation; 890FTS Field Tintable Ultra Low Modulus Architectural Silicone Sealant - Class 100: www.pecora.com.
c. Pecora Corporation; 890FTS-TXTR Field Tintable Textured Ultra Low Modulus Architectural Silicone Sealant - Class 50: www.pecora.com.
d. Momentive Performance Materials, Inc (formerly GE Silicones); SilPruf NB SCS9000: www.siliconeforbuilding.com.
e. Substitutions: See Section 01 6000 - Product Requirements.

B. Type 6 - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: White or Clear.
2. Manufacturers:
a. Pecora Corporation; 898NST Sanitary Silicone Sealant - Class 50: www.pecora.com.
b. Sika Corporation; Sikasil GP: www.usa-sika.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

C. Type 1A - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Color: Match adjacent finished surfaces.
3. Manufacturers:
a. Sika Corporation; Sikaflex-15 LM: www.usa-sika.com.
b. Substitutions: See Section 01 6000 - Product Requirements.

D. Type 2 - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: Standard colors matching finished surfaces, Type OP (opaque).
2. Grade: ASTM C834; Grade - Minus 18 Degrees C.
3. Manufacturers:
a. Hilti, Inc; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com/#sle.
b. Pecora Corporation; AC-20 + Silicone Acrylic Latex Caulking Compound: www.pecora.com.
c. Sherwin-Williams Company; White Lightning 3006 Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
d. Tremco Global Sealants; Tremfles 834 Siliconized Acrylic Latex Selant: www.tremcosealants.com..
e. Substitutions: See Section 01 6000 - Product Requirements.

E. Type 3 - Non-Curing Butyl Sealant: Solvent-based; ASTM C919; single component, nonsag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.
1. Manufacturers:
a. Pecora Corporation; BA-98: www.pecora.com.

2.04 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

D. Preinstallation Adhesion Testing: Install a sample for each test location shown in the test plan.
   1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
   2. Notify Architect of date and time that tests will be performed, at least 7 days in advance.
   3. Record each test on Preinstallation Adhesion Test Log as indicated.
   4. If any sample fails, review products and installation procedures, consult manufacturer, or take whatever other measures are necessary to ensure adhesion; re-test in a different location; if unable to obtain satisfactory adhesion, report to Architect.
   5. After completion of tests, remove remaining sample material and prepare joint for new sealant installation.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Acoustical sealant installation: See Section 09 2116.

D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
   1. Width/depth ratio of 2:1.
      a. Minumim 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.

E. Install backer rod using blunt or rounded tool to a uniform (+/- 1/8 inch) depth without puncturing the material.

F. Install bond breaker backing tape where backer rod cannot be used.

G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

H. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

I. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet, notify Architect immediately.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

D. Repair destructive test location damage immediately after evaluation and recording of results.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

C. Section 09 9113 - Exterior Painting: Field painting.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for 2 exterior hollow metal door and frame sets.
      a. This allowance includes purchase, delivery, and installation of two exterior door frames in masonry walls and providing two hollow metal doors, including installation and hardware.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing two exterior hollow metal doors and frames.
      a. Unit of measure: Per door and frame installed.

1.04 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

J. ITS (DIR) - Directory of Listed Products; current edition.

K. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.

L. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

M. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.

N. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.

O. UL (BMD) - Building Materials Directory; current edition.

P. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

Q. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

R. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 01 3000 - 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 standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes installation requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:

1. Ceco Door, an Assa Abloy Group company; _____: www.assaabloydss.com.
2. Phillips Manufacturing Company.
3. Pioneer Industries.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESIGN CRITERIA

A. Requirements for Hollow Metal Doors and Frames:

1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Door Top and Bottom Closures: Min. 16 gage flush with top of faces and edges.
4. 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 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 HOLLOW METAL DOORS

A. Type ___, Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 1 - Standard-duty.
b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
2. Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inch, nominal.
4. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.

B. Type ___, Interior Doors, Non-Fire Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 1 - Standard-duty.
b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
2. Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inch, nominal.

C. Type ___, Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 1 - Standard-duty.
b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
a. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.

b. Provide units listed and labeled by UL (DIR) or ITS (DIR).
c. Attach fire rating label to each fire rated unit.
d. Smoke and Draft Control Doors (Indicated with letter "S" on Drawings and/or Door Schedule): Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
   1) Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
   2) Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
   3) Label: Include the "S" label on fire-rating label of door.

3. Door Thickness: 1-3/4 inch, nominal.

D. Interior Smoke and Draft Control Doors (Indicated as "S" on Drawings): Same fire rated construction as the fire-rated doors, and the following;
1. Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
2. Gasketing: Where smoke gasketing is required, surface mounted Pemko S88D is to be used..
3. Label: UL "S" label.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. General:
1. Comply with the requirements of grade specified for corresponding door, except:
   a. ANSI/SDI A250.8 (SDI-100), Level 3, Interior Door Frames: 16 gage, 0.053 inch, minimum thickness.
   b. ANSI/SDI A250.8 (SDI-100), Level 4, Exterior Door Frames: 14 gage, 0.067 inch, minimum thickness.
   c. Frames for Wood Doors: Comply with frame requirements in accordance with ANSI/SDI A250.8 (SDI-100), Level 1, 18 gage, 0.042 inch, minimum thickness.
2. Provide 22 gage min. mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
3. Frames in Masonry Walls: Size to suit masonry coursing with head member to fill opening without cutting masonry units.
4. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
5. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.
6. Hardware Reinforcement:
   a. Frames: mortised, reinforced, drilled and tapped at the factory for fully templatedmortised hardware only, in accord with approved hardware schedule and templates. When applying surface-mounted hardware frames shall have reinforcing plates only. Drilling and tapping will be preformed under Section 06 2000.
   b. Minimum thickness reinforcement plates:
      1) Hinge and pivot reinforcement: 7 gage, 1-1/4 inch x 10 inch min. size.
      2) Strike reinforcement: 12 gage.

3) Flush bolt reinforcement: 12 gage.
4) Closer reinforcement: 12 gage.
5) Surface mounted hardware: 12 gage.

C. Exterior Door Frames: Knock-down type.
1. Weatherstripping: Separate, see Section 08 7100.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.

E. Door Frames, Fire-Rated: Knock-down type.
1. Fire Rating: Same as door, labeled.

F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

G. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

H. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

I. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.

2.05 ACCESSORIES

A. Glazing: As specified in Section 08 8000, factory installed.

B. Removable Stops: 20 gage hollow metal stops, 5/8 inch deep with butted corners prepared for countersunk, flat head cadimum or zinc plated screws.

C. Floor Anchors: Min. 14 gage, welded in place.

D. Jamb Anchors:
1. Masonry Wall Installation: Adjustable 16 gage T-strap anchors.
a. Provide 3 anchors per jamb for frames up to 7 foot 6 inches in height.
b. Provide 4 anchors per jamb for frames from 7 foot 6 inches to 8 feet in height.
c. Provide 1 anchor per jamb for every 2 feet in height or fraction thereof for frames over 8 feet.
2. Stud Wall Installation: 18 gage welded anchors.
a. Provide 4 anchors per jamb for frames up to 7 foot 6 inches in height.
b. Provide 5 anchors per jamb for frames from 7 foot 6 inches to 8 feet in height.
c. Provide 5 anchors plus 1 additional anchor per jamb for every 2 feet in height or fraction thereof for frames over 8 feet.
d. Provide Frames over 5 feet wide with welded anchors 8 inches from each corner and 24 inches on center across the head.
3. After-set Frames:
a. Provide 4 anchors per jamb, punched and dimpled, for frames up to 7 foot in height.
b. Provide pipe spacers, 3/8 inch steel bars and 12 gage plates at 24 inches on center, each jamb, with expansion bolts.

E. Grout for Frames: Portland cement grout with 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 factory- or shop-assembled frames.

2.06 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI 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.

C. Verify that finished walls are in plane to ensure proper door alignment.

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 doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Coordinate installation of hardware.

F. Coordinate installation of glazing.

G. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified door and frame standards or custom guidelines indicated.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

END OF SECTION

SECTION 08 1423
CLAD COMMERCIAL DOOR

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum Clad Wood Commercial Door, complete with, glazing, weather strip, simulated divided lite, and specified anchors, trim and attachments.

1.02 RELATED SECTIONS

A. Section 07 9200 - Joint Sealants: Sill sealant and perimeter caulking

B. Section 08 7100 - Door Hardware: Hardware other than furnished by door and frame manufacturer

C. Section 09 9000 - Paints and Coatings: Paint or stain other than factory applied finish

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for one exterior clad commercial door and hollow metal frame set.
      a. This allowance includes purchase, delivery, and installation of one exterior hollow metal door frame in masonry walls and providing one clad commercial door, including installation and hardware.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing one exterior clad commercial door and hollow metal frame set.
      a. Unit of measure: Per door and frame installed.

1.04 REFERENCES

A. WDMA I.S.4: Industry Standard for Water Repellent Preservative Treatment Millwork

B. Sealed Insulating Glass Manufactures Association / Insulating Glass Certification Council
   1. (SIGMA/IGCC)

C. American Architectural Manufacturers Association (AAMA): 2605: Voluntary Specification for
   1. High Performance Organic Coatings on Architectural Extrusions and Panels.

D. American Society for Testing and Materials (ASTM): E330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

1.05 SYSTEM DESCRIPTION

A. Design and Performance Requirement. Design Pressure is applicable to individual units and may vary with unit size.
   1. Units shall be designed to comply with ASTM E330 for structural performance SHED DP +25/-25 psf (with removable mullion and rim device)

1.06 SUBMITTALS

A. Shop Drawings: Submit shop drawings.

B. Product Data: Submit catalog data.

C. Samples:
   1. Submit corner section.

2. Include glazing system, quality of construction and specified finish.

D. Quality Control Submittals: Certificates: submit manufacture's certification indicating compliance with specified performance and design requirement.

1.07 QUALITY ASSURANCE

A. Requirements: consult local code for IBC (International Building Code) adoption year and pertinent revisions.

1.08 DELIVERY

A. Deliver in original and protect from weather.

1.09 STORAGE AND HANDLING

A. Prime and seal wood surfaces, including to be concealed by wall construction, if more than thirty (30) days will expire between delivery and installation.

B. Store door panels flat on a level surface in a clean and dry storage area above ground to protect from weather.

C. Condition doors to local average humidity before hanging.

1.10 WARRANTY

A. Clear insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years from the original date of purchase. Glass is warranted against stress cracks caused by manufacturing defects from (10) years from the original date of purchase.

B. Standard exterior aluminum cladding finish is warranted against manufacturing defects resulting in chalk, fade and loss of adhesion (peel) per the American Manufacture's Association's (AAMA) Specification 2605-11 Section 8.4 and 8.9 for twenty (20) years from the original date of purchase.

C. Factory applied interior finish is warranted to be free from the Finish Defects for a period of five (5) years from the original date of purchase.

D. Hardware and other non-glass components are warranted to be free from manufacturing defects for ten (10) years from the original date of purchase.

PART 2 PRODUCTS

2.01 MANUFACTURED UNITS

A. Basis of Design: Aluminum Clad Commercial Door, as manufactured by Marvin Windows and Doors, Ripley, Tennessee.

2.02 FRAME DESCRIPTION

A. Finger-Jointed, edge-glued White Oak core with non finger-jointed White Oak veneer;
   1. Kiln dried to moisture content no greater than twelve (12) percent at the time of fabrication
   2. Water repellent, preservative treated in accordance with WDMA I.S.4. Frame width: 4 9/16" (116mm)

B. Frame thickness: 1 1/16" (27mm)

C. Exterior extruded aluminum clad 0.050" (1.3mm) thick

D. Standard factory installed thermal barrier saddle low profile .500" (13mm) by 7.125" (181mm) sill.

2.03 PANEL DESCRIPTION

A. 2 ¼” Doors: Stiles and top rail contain laminated veneer lumber (LVL) core with non finger-jointed White Oak veneer. Solid wood bottom and intermediate rails.

B. Composite panel thickness: 2 ¼” (57mm)

C. Exterior extruded aluminum clad 0.055” (1.4mm) thick

D. Top rail width: 8 1/8” (206mm)

E. Stile width: 6” (152mm)

F. Bottom rail height: 11 3/8” (289mm)

G. Panel corners glued and fastened with 5/8” x 4” (16mm x 102mm) fluted hardwood dowels.

H. Removable interior vinyl glazing stops with non finger-jointed wood covers. 2 ¼” panel: visible nail fastener on glazing stop.

2.04 GLAZING

A. Select quality complying with ASTM C1036. Comply with 16 CFR 1201 Safety Standard for Architectural Glazing Materials.Insulating glass IGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E774.

B. Glass Type: Gray tinted, Low E2 with Argon, Obscure, Laminated

C. Glazing Seal: Silicone bedding, exterior

2.05 FINISH

A. Exterior: Aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets
   1. AAMA 2605 requirements.
   2. Custom Colors

B. Interior Finish Options:
   1. Factory applied water borne stain. Stain applied over a wood (stain) conditioner. A water-borne acrylic enamel clear coat applied in two separate coats, with light sanding between coats, applied over the stain.
   2. Color: Wheat, Honey, Hazelnut, Leather, Cabernet, or Espresso.

2.06 HARDWARE

A. Hinges: 4 ½” x 4 ½” square corner ball bearing hinges.
   1. Finish: Satin Chrome (US26D) over brass substrate, Bronze (US10A) over brass substrate, Brass (US3), Stainless Steel (US32D).

B. Locking System:
   1. No lock no bore is standard
   2. Optional Commercial Hardware Package: closer, rim device, mortise lock, removable mullion and kick plate

C. Optional hardware Routs and Preps.
   1. Von Duprin Push pad Rim Devices and Trim Sets
   2. Von Duprin Cross Bar Device and Trim Sets
   3. Schlage L Mortise Lock and Trim Sets
   4. Schlage ND Cylindrical locks
   5. Alarm Lock

2.07 WEATHER STRIP

A. Head jamb and hinge jamb: bulb type weather strip.

1. Color: Beige or optional black

B. Locking jamb: Gray pile weather strip

C. Surface mounted aluminum panel drip mounted at bottom of panel (shipped loose for field application)
   1. Standard colors: Matches panel finish with matching screws
   2. Custom colors: Matches panel finish with stainless steel screws

2.08 JAMB EXTENSION

A. Factory installed, for wall thickness indicated or required.

B. Finish: Match interior frame wood species and finish.

2.09 RAISED PANELS

A. Stamped Raised Panel
   1. 6” (152mm) intermediate rail constructed of 0.080” aluminum to the exterior with foam backing. Available in all aluminum clad colors. Aluminum clad colors meeting AAMA 2605 requirements.
   2. Core is medium density fiberboard (MDF) with non finger-jointed wood laminate to the interior.

B. Placement option
   1. High Placement: 40 5/16” (1024mm) on center (OC) of 6” (152mm) intermediate rail from bottom sill for a 25 1/8” (638mm) visible panel height.

2.10 SIMULATED DIVIDED LITES (SDL)

A. 7/8” (22mm) with internal spacer bar.
   1. Exterior muntins: Extruded aluminum 0.055” (1.4mm) thick. Color matched panel aluminum cladding color.
   2. Interior muntins: Wood and finish interior of door
   3. Pattern: Rectangular. Custom lite layout
   4. Standard interior sticking: Ogee

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Condition: Before installation, verify openings are plumb, square and of proper dimensions as required. Report frame defects or unsuitable conditions to the General contractor before proceeding.

B. Acceptance of Condition: Beginning on installation confirms acceptance of existing conditions.

3.02 INSTALLATION

A. Install door unit(s) according to manufacturer’s instruction and reviewed shop drawing.

B. Install sealant and related backing materials at perimeter of unit or assembly in accordance with Section 07 9200 Joint Sealants. Do not use expansive foam sealant.

C. Use finish nails to apply wood trim and mouldings.

3.03 CLEANING

A. Remove visible labels and adhesive residue according to manufacturer’s instruction.

B. Leave windows and glass in a clean condition. Final cleaning as required in Section 01 74 00.

3.04 PROTECTING INSTALLED CONSTRUCTION

A. Protect doors from damage by chemicals, solvents, paint or other construction operations that may cause damage.

END OF SECTION

SECTION 08 1433
STILE AND RAIL WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood doors and frames, stile and rail design; fire rated and non-fire rated.

B. Panels of wood and glass.

1.02 RELATED REQUIREMENTS

A. Section 06 2000 - Finish Carpentry: Wood door installation.

B. Section 08 1113 - Hollow Metal Doors and Frames.

C. Section 08 7100 - Door Hardware.

D. Section 08 8000 - Glazing.

E. Section 09 9123 - Interior Painting: Field finishing doors.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.

1. Provide an allowance for two interior stile and rail door and wood frame sets.
   a. This allowance includes purchase, delivery, and installation of two interior wood frames in masonry walls with finishing trim and providing two interior stile and rail doors, including prefinishing, installation and hardware.
   b. This allowance shall be included as a separate line item and adjusted by a Unit Price.
2. Provide an allowance of $60,000 for material and labor related to field adjustment of stile and rail doors and frames.
   a. This allowance includes the labor and material related to the field adjustment of stile and rail doors and frames, as directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.
3. Provide an allowance of $60,000 for material and labor related to hardware adjustment for stile and rail doors and frames.
   a. This allowance includes purchase, delivery, and installation of additional hardware and adjustment of hardware for stile and rail doors and frames, as directed by the Architect.
   b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

B. Unit Prices:

1. Unit price for providing two interior stile and rail door and wood frame sets.
   a. Unit of measure: Per door and frame installed.

1.04 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

C. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

E. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.

F. ITS (DIR) - Directory of Listed Products; current edition.

G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

H. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.

I. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.

J. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

K. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

L. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

M. WDMA I.S. 6A - Interior Architectural Wood Stile and Rail Doors; 2013.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate stile and rail core materials and construction; veneer species, type and characteristics.

C. Specimen warranty.

D. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing.

E. Samples: Submit two samples of door construction, 12 x 12 inch in size cut from top corner of door.

F. Samples: Submit two samples of door veneer, 12 x 12 inch in size illustrating wood grain, stain color, and sheen.

G. Manufacturer's Installation Instructions: Indicate special installation instructions.

H. Warranty, executed in Owner's name.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver, and store doors in accordance with quality standard specified.

B. Protect doors with resilient packaging . Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Stile and Rail Wood Doors:
1. Eggers Industries: www.eggersindustries.com.
2. Harring Doors.
3. Maiman Company: www.maiman.com.
4. Marshfield DoorSystems, Inc: www.marshfielddoors.com.
5. Woodtech Architectural Stile and Rail Doors: www.woodtechdoor.com

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000.

2.03 DOORS

A. Quality Level: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS).

B. Interior Doors: 1-3/4 inches thick ; veneer and lumber stile and rail construction; mortise and tenon joints. Opaque finish where indicated on drawings.

C. Wood veneer facing for field opaque finish where indicated on drawings.

2.04 DOOR AND PANEL FACINGS

A. Veneer Facing for Transparent Finish: White Oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
1. Pairs: Pair match each pair; set match pairs within 10 feet of each other when doors are closed.

B. Adhesive: Type I - Waterproof.

2.05 FRAMES

A. Wood Flat Jamb, Fire-rated and non-rated:
1. Field applied door stop - shipped long, loose, and unmitered.
2. Veneered construction
3. Standard jamb thickness:
a. 13/16” (non-rated and 20 minute)
b. 1” (45/60/90 minute fire-rated)
4. Standard door stop size: 5/8” x 1-1/2”
5. Finish: Match door finish.

2.06 COMPONENTS

A. Glazed Openings:
1. Heat-Strengthened and Fully Tempered Glass: ASTM C1048.
2. Glazing: Single vision units, 1/4 inch thick panes of glass.
3. Tint: Clear.

B. Glazing: As specified in Section 08 8000.

C. Panel or Glass Retention Molding: Wood of same species as door facing, molded stop applied one-side, mitered corners; prepared for set fasteners.

2.07 DOOR CONSTRUCTION

A. Vertical Exposed Edge of Stiles: Hardwood for paint finish.

B. Panels: Raised, 3-ply solid wood.

C. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.

D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

E. Factory install glazing in doors in compliance with quality standards specified, using manufacturer's standard elastomeric glazing sealant.

F. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with NFPA 252 or UL 10B - Negative (Neutral) Pressure; listed in UL (DIR) or ITS (DIR) and without any visible seals when door is open.

G. Smoke and Draft Control Doors (Indicated as "S" on Drawings): In addition to required fire rating, provide stile and rail door assemblies tested in accordance with UL 1784 with maximum air leakage of 3.0 cfm per sq ft of door opening at 0.10 inch w.g. pressure at both ambient and elevated temperatures for "S" label; if necessary, provide additional gasketing or edge sealing.

2.08 FACTORY FINISHING

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 5, Varnish, Conversion.
      b. Stain: As selected by Architect.
      c. Sheen: Satin.

B. Factory finish doors in accordance with approved sample.

C. Seal door top and bottom edge with color sealer to match door facing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.02 INSTALLATION

A. Install frames in accordance with manufacturer's instructions and specified quality standards.
   1. Install fire-rated frames in accordance with NFPA 80 requirements.

B. Install doors in accordance with manufacturer's instructions and specified quality standards.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
   2. Install smoke and draft control doors in accordance with NFPA 105 requirements.

C. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

D. Machine cut for hardware.

E. Coordinate installation of doors with installation of frames and hardware.

F. Coordinate installation of glazing.

3.03 TOLERANCES

A. Conform to specified quality standard for fit, clearance, and joinery tolerances.

B. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 x 84 inch surface area.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall access door and frame units.

B. Ceiling access door and frame units.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting: Field paint finish.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowance: Provide the following allowance in addition to the work shown as Base Bid.
   1. Provide an allowance for three interior access door and frame sets.
      a. This allowance includes purchase, delivery, and installation of three interior access door and frame sets, including installation and hardware.
      b. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing interior access door and frame sets.
      a. Unit of measure: Per access door and frame installed.

1.04 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; current edition.

B. UL (FRD) - Fire Resistance Directory; current edition.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Manufacturer's Installation Instructions: Indicate installation requirements.

D. Project Record Documents: Record actual locations of each access unit.

PART 2 PRODUCTS

2.01 ACCESS DOOR AND PANEL APPLICATIONS

A. Walls, Unless Otherwise Indicated:
   1. Size: 18 by 24 inch, unless otherwise indicated.
   2. Standard duty, hinged door.
   3. Tool-operated spring or cam lock; no handle.
   4. In All Wall Types: Surface mounted face frame and door surface flush with frame surface.

B. Walls in Wet Areas:
   1. Material: Steel, hot-dipped zinc or zinc-aluminum-alloy coated.
   2. Size: 12 by 12 inch, unless otherwise indicated.
   3. Standard duty, hinged door.
   4. Tool-operated spring or cam lock; no handle.
   5. In All Wall Types: Surface mounted face frame and door surface flush with frame surface.

C. Fire Rated Walls: See drawings for wall fire ratings.
   1. Material: Steel.
   2. Size: 12 by 12 inch, unless otherwise indicated.
   3. Insulated, double skin door panel.
   4. Tool-operated spring or cam lock; no handle.

D. Ceilings, Unless Otherwise Indicated: Same type as for walls.
   1. Size in Lay-in Grid Ceilings: To match grid module.
   2. Size in Other Ceilings: 12 by 12 inch, unless otherwise indicated.
   3. Standard duty, hinged door.
   4. Tool-operated spring or cam lock; no handle.

2.02 WALL AND CEILING UNITS

A. Access Doors: Factory fabricated door and frame units, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies that units are to be installed in.
   1. Door Style: Single thickness with rolled or turned in edges.
   2. Double-Skinned Hollow Steel Door Panels: 16 gage, 0.059 inch, minimum, on both sides and each edge.
   3. Units in Fire Rated Assemblies: Fire rating as required by applicable code for the fire rated assembly that access doors are being installed.
   4. Steel Finish: Primed.
   5. Primed and Factory Finish: Polyester powder coat; color _____.
   6. Hardware:
      a. Hardware for Fire Rated Units: As required for listing.
      b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings. Secure rigidly in place.

C. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION

SECTION 08 5200
ALUMINUM CLAD WOOD WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory fabricated aluminum clad wood windows.

B. Glazing.

C. Operating hardware.

D. Custon extruded aluminum casing trim for exterior finishing.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Rough opening framing.

B. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

C. Section 09 9123 - Interior Painting: Site finishing wood surfaces.

1.03 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2011.

B. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Glass Doors

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Show component dimensions, anchorage and fasteners, and glass.

C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, and installation requirements.

D. Submit two samples ____by____ inches in size illustrating window frame section.

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

F. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
   1. Evidence of AAMA Certification; label or other documentation.
   2. Evidence of WDMA Certification.
   3. Evidence of CSA Certification.
   4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

G. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

1.05 QUALITY ASSURANCE

A. Manufacturer and Installer Qualifications: Company specializing in manufacturing commercial wood windows with minimum ten years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect factory finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and after installation of sealants.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide ten year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same.

D. Warranty: Include coverage for the following:
   1. Degradation of color finish.
   2. Delamination or separation of finish cladding from window member.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Single Hung: Marvin Window and Doors, Clad Ultimate Single Hung - New Generation.

B. Basis of Design:Fixed and Project-out: Marvin Window and doors, Clad Ultimate - New Generation.

C. Aluminum Clad Wood Windows:
   1. LePage Millwork, Quebec, Canada.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000.

2.03 ALUMINUM CLAD WOOD WINDOWS

A. Aluminum Clad Wood Windows: Wood frame and sash, factory fabricated and assembled.
   1. Exterior Finish: Aluminum frame and sash components, and PDL bars:70% fluoropolymer based coating in compliance with AAMA 2605-05.
   2. Interior Finish: Interior wood is to bare for field finishing.
   3. Color: Custom color.
   4. Configuration: As indicated on drawings.
   5. Window Product Type: H (VS) - Hung window (Vertical sliding window) and with double hung appearance, offset sashes, in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
   6. Factory glazed; wet-dry glazing method.
   7. Glazing Methods:
      a. Standard fixed units have 3/16 inch (5mm) wide glazing tape and primary silicone on #1 surface along sight line paired with latex sealant on #4 surface at bottom wood glazing bead.
      b. High Performance fixed units have silicone-glaze structural silicone bedding sealant on #1 surface with a 0.5 inch (13 mm) bite, and supplemental siliconized latex sealant on #4 surface at bottom wood glazing bead.
      c. Impact Glazing for IG units utilizes a reinforcing vinyl bracket installed into a kerf in the sash and siliconed.

8. Wood Species: Clear pine, preservative treated using treatment type suitable for required finish.
9. Fasteners: Concealed from view.

2.04 COMPONENTS

A. Glazing: Double glazed, clear, Low-E coated, argon filled, with glass thicknesses as recommended by manufacturer for specified wind conditions.
   1. Cardinal Glass: Lo-E 366.
   2. Spacer bar: Black stainless steel with bent corners, desicant filled.

B. Sills: 0.125 nominal thickness, extruded aluminum; sloped for positive wash; fit under sash to project beyond wall face; one piece full width of opening.

C. Stools: Refer to Section 06 2000 - Finish Carpentry for interior wood stools.

D. Simulated Divided Lites:
   1. 7/8” (22mm) wide, with black internal spacer bar.
   2. Exterior muntins: 0.050” (1.3mm) thick extruded aluminum.
   3. Interior muntins: Pine.
   4. Muntins adhere to glass with closed-cell copolymer acrylic foam tape.
   5. Exterior sticking: Putty
   6. Interior Sticking: Ogee
   7. Patterns: As shown
   8. Finish - exterior matches custom exterior aluminum clad color, interior matches interior wood species and color.

E. Fasteners: Stainless steel.

F. Sealant and Backing Materials: As specified in Section 07 9200 of types as indicated.

G. Wood for Interior Casing and Trim: Refer to Section 06 2000 - Finish Carpentry.

H. Accessories: Provide related flashings, and anchorage and attachment devices.

I. Sealant for Setting Sills, Stools, Aprons, and Sill Flashing: Non-curing butyl type.

2.05 PERFORMANCE REQUIREMENTS

A. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 requirements for the specific window type in accordance with the following:
   1. Performance Class (PC): CW.
   2. Performance Grade (PG): 50, with minimum design pressure (DP) of 50.13 psf.

B. Overall U-Value, Including Glazing: 0.35, maximum, measured on the window size required for this project.

2.06 ACCESSORIES

A. Installation Accessories:
   1. Installation brackets: 6 3/8” (162mm).

B. Aluminum Extrusions:
   1. Casing Profile: Custom exterior casing per details.
   2. Aluminum Extrusion:Mullion Cover, Subsill
   3. Finish: Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements
   4. Color: Custom.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

B. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

C. Install sills, stools, and casings.

D. Set sill members and sill flashing in continuous bead of sealant.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

3.03 TOLERANCES

A. Maximum Variation from Level or Plumb: 1/16 inch per 3 ft non-cumulative or 1/8 inch per 10 ft, whichever is less.

3.04 FIELD QUALITY CONTROL

A. Test installed units in conformance with AAMA 502-90 for air and water infiltration with the window manufacturer, contractor, and owner present.
   1. Mnimum three tests per unit type.

B. Select test units as directed by the owner's representative and use an AAMA-accredited laboratory provided by the contractor.

C. Repair and make adjustments to window unit until test performance is achieved. Make similar repairs and adjustments to all window units.
   1. Repeat test until windows pass performance test.

D.

3.05 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

3.06 CLEANING

A. Remove protective material from factory finished surfaces.

B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

C. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

D. Refer to Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

END OF SECTION

SECTION 08 6300
METAL-FRAMED SKYLIGHTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum skylight framing system.

B. Skylight glazing.

C. Fasteners, anchors, reinforcement, and flashings.

1.02 RELATED REQUIREMENTS

A. Section 07 5300 - Elastomeric Membrane Roofing: Roofing system and base flashing at skylight curb.

B. Section 07 9200 - Joint Sealants: Sealing joints between skylight frames and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

H. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015.

I. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2012).

J. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's specifications, standard details, and installation requirements.

C. Shop Drawings: Indicate framed opening requirements and tolerances, spacing of members, anticipated deflection under load, affected related work, expansion and contraction joint locations and details, and sizes and locations for field welding.

1. Show field measurements on shop drawings.

D. Selection Samples: Submit full range of aluminum finish samples for Architect's color selection.

E. Samples: Submit two samples, not less than 12 by 12 inch in size illustrating appearance of prefinished aluminum and specified glazing system, including glazed edge and corner.

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

G. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations.

H. Manufacturer's Installation Instructions: Indicate special procedures, safety precautions, and perimeter conditions requiring special attention.

I. Field Quality Control Submittals: Report of field testing for water leakage.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Provide wrapping to protect prefinished aluminum surfaces. Do not use adhesive papers or spray coatings that bond when exposed to sunlight or weather.

1.06 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.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work, including leaks, discoloration, failure of seal at insulated glazing units, and excessive thermal or structural movement, within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 METAL-FRAMED SKYLIGHTS

A. Metal Framed Skylights: Factory-fabricated, glazed.
   1. Frame: Extruded aluminum structural members with integral condensation collection and guttering system thermally separated from exterior pressure bar.
   2. Glazing System: Pressure glazing bar system for sloped joints and two (2)-sided structural sealant glazing (SSG) for horizontal joints.
   3. Glazing: Insulating glass.
   4. Aluminum Finish: Superior performing organic coatings.
   5. Fabricate to prevent harmonic vibration, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

B. Performance Requirements: Provide products that comply with the following:
   1. Structural Design: Design and size components to withstand dead loads and specified live loads without damage or permanent set.
   2. Wind Loads: Test in accordance with ASTM E330/E330M, using loads 1.5 times the specified design pressures and 10 second duration of maximum load.
   3. Glazing Support Member Deflection Under Wind Load: 1/180 of span, maximum.
   4. Thermal Movement: Design system to accommodate thermal expansion and contraction over ambient temperature range of 100 degrees F, dynamic loading and release of loads,

creep of concrete structural members and deflection of structural support framing without damage to skylight system components or loss of weathertightness.

5. Air Leakage: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft for glazed area, measured at a reference differential pressure across assembly of 1.57 psf in accordance with ASTM E283.

2.02 MATERIALS

A. Aluminum Extrusions: Alloy and temper 6063-T5, 6063-T6, or 6061-T6 members complying with ASTM B221 (ASTM B221M), with minimum thickness 1/8 inch for structural members and 1/16 inch for non-structural members.

B. Formed Aluminum: Sheet material of alloy 5052, 5005, or 6061-T651 members complying with ASTM B209 (ASTM B209M), with minimum thickness 1/8 inch for structural members and 1/16 inch for non-structural members.

C. Internal Reinforcement: ASTM A36/A36M; Steel shapes as required for strength and mullion size limitations, hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

D. Insulating Glass: Sealed insulated units, outer pane of clear transparent, laminated glass; inner pane of clear transparent, laminated glass; space of sealed air, metal edge frame.

E. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.

F. Touch-Up Primer for Galvanized Steel Surfaces: Zinc rich type.

G. Protective Back Coating: Asphaltic mastic, ASTM D4479/D4479M, Type I.

2.03 FABRICATION

A. Rigidly fit and secure joints and corners with screw and spline. Make joints rigid, with connections that are flush, hairline, and weatherproof.

B. Fabricate components to allow for expansion and contraction with minimum clearance and shim spacing around perimeter of assembly.

C. Drain to exterior any water entering exterior joints, condensation occurring in glazing channels, or migrating moisture occurring within system.

D. Prepare components to receive concealed anchorage devices. Ensure that fasteners and anchorage devices will be concealed upon completion of installation.

2.04 FINISHES

A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.

B. Color: To be selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that structural curb is ready to receive skylight system. Coordinate installation of roofing and other adjacent work to ensure weathertight construction.

3.02 PREPARATION

A. Apply 1 coat of protective coating to concealed aluminum and steel surfaces in contact with dissimilar materials.

3.03 INSTALLATION

A. Install metal-framed skylights in accordance with manufacturer's instructions.

B. Set skylight structure plumb, level, and true to line, without warp or rack of frames or glazing panels. Anchor securely in place in accordance with approved shop drawings.

C. Maintain assembly dimensional tolerances, aligning with adjacent work.

D. Install base flashings in accordance with Section 07 6200.

E. Touch up damaged finishes so repair is imperceptible from 6 feet. Remove and replace components that cannot be satisfactorily touched up.

3.04 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Wash down exposed surfaces; wipe surfaces clean.

C. Remove excess sealant by methods recommended by skylight manufacturer.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY:

A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
   1. Door hardware for steel (hollow metal) doors.
   2. Door hardware for aluminum doors.
   3. Door hardware for wood doors.
   4. Door hardware for other doors indicated.
   5. Keyed cylinders as indicated.

B. Related Sections:
   1. Division 6: Rough Carpentry.
   2. Division 8: Aluminum Doors and Frames
   3. Division 8: Hollow Metal Doors and Frames.
   4. Division 8: Wood Doors.
   5. Division 26 Electrical
   6. Division 28: Electronic Security

C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
   1. Builders Hardware Manufacturing Association (BHMA)
   2. NFPA 101 Life Safety Code
   3. NFPA 80 -Fire Doors and Windows
   4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
   5. UL10C - Positive Pressure Fire Test of Door Assemblies
   6. ANSI-A117.1 - Accessible and Usable Buildings and Facilities
   7. DHI /ANSI A115.IG - Installation Guide for Doors and Hardware
   8. ICC - International Building Code

D. Intent of Hardware Groups
   1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
   2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.

E. Allowances
   1. Refer to Division 1 for allowance amount and procedures.

F. Alternates
   1. Refer to Division 1 for Alternates and procedures.

1.02 SUBSTITUTIONS:

A. Comply with Division 1.

1.03 SUBMITTALS:

A. Comply with Division 1.

B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.

C. Product Data: Manufacturer's specifications and technical data including the following:
   1. Detailed specification of construction and fabrication.
   2. Manufacturer's installation instructions.
   3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
   4. Submit 6 copies of catalog cuts with hardware schedule.
   5. Provide 9001-Quality Management and 14001-Environmental Management for products listed in Materials Section 2.2

D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.
   1. List groups and suffixes in proper sequence.
   2. Completely describe door and list architectural door number.
   3. Manufacturer, product name, and catalog number.
   4. Function, type, and style.
   5. Size and finish of each item.
   6. Mounting heights.
   7. Explanation of abbreviations and symbols used within schedule.
   8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.

E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
   1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.

F. Samples: (If requested by the Architect)
   1. 1 sample of Lever and Rose/Escutcheon design, (pair).
   2. 3 samples of metal finishes

G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.
   1. Operating and maintenance manuals: Submit 3 sets containing the following.
      a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
      b. Catalog pages for each product.
      c. Name, address, and phone number of local representative for each manufacturer.
      d. Parts list for each product.
         1) Copy of final hardware schedule, edited to reflect, "As installed".
         2) Copy of final keying schedule
         3) As installed “Wiring Diagrams” for each piece of hardware connected to power, both low voltage and 110 volts.
         4) One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.04 QUALITY ASSURANCE

A. Comply with Division 1.
   1. Statement of qualification for distributor and installers.
   2. Statement of compliance with regulatory requirements and single source responsibility.
   3. Distributor's Qualifications: Firm with 3 years' experience in the distribution of commercial hardware.
      a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
      b. Hardware Schedule shall be prepared and signed by an AHC.
         1) Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
         2) Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
            (a) Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
            (b) Underwriters Laboratories requirements have precedence over this specification where conflict exists.
         3) Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.

B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Comply with Division 1.
   1. Deliver products in original unopened packaging with legible manufacturer's identification.
   2. Package hardware to prevent damage during transit and storage.
   3. Mark hardware to correspond with "reviewed hardware schedule".
   4. Deliver hardware to door and frame manufacturer upon request.

B. Storage and Protection: Comply with manufacturer's recommendations.

1.06 PROJECT CONDITIONS:

A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.

B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.07 WARRANTY:

A. Refer to Conditions of the Contract

B. Manufacturer's Warranty:
   1. Closers: Ten years
   2. Exit Devices: Five Years
   3. Locksets Limited Lifetime

4. Cylinders: Three years
5. All other Hardware: Two years.

1.08 OWNER'S INSTRUCTION:

A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.09 MAINTENANCE:

A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.
   1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
   2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
   3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.

B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1.

1.	Manufacturer:	Approved:	
2.	Hinges	Stanley	As approved by Architect
3.	Locksets	Best	As approved by Architect
4.	Wireless Lockset	By Security Contractor	
5.	Cylinders	Best	As approved by Architect
6.	Exit Devices	Precision	As approved by Architect
7.	Closers	Stanley D-4550	As approved by Architect
8.	Automatic Operators	Stanley D-4990	As approved by Architect
9.	Push/Pull Plates	Trimco	As approved by Architect
10.	Protection Plates	Trimco	As approved by Architect
11.	Overhead Stops	ABH	As approved by Architect
12.	Door Stops	Trimco	As approved by Architect
13.	Flush Bolts	Trimco	As approved by Architect
14.	Threshold/Gasketing	National Guard	As approved by Architect

2.02 MATERIALS:

A. Hinges:
   1. Template screw hole locations
   2. Minimum of 2 permanently lubricated non-detachable bearings
   3. Equip with easily seated, non-rising pins
   4. Sufficient size to allow 180-degree swing of door
   5. Furnish hinges with five knuckles and concealed bearings
   6. Provide hinge type as listed in schedule.
   7. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.

8. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
9. UL10C listed for Fire rated doors.

B. Mortise Type Locks and Latches:
1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C.
2. Furnish UL or recognized independent laboratory certified mechanical operational testing to 4 million cycles minimum.
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Fit ANSI A115.1 door preparation
5. Functions and design as indicated in the hardware groups
6. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
7. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
8. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
9. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated
10. Provide sufficient curved strike lip to protect door trim
11. Lever handles must be of forged or cast brass, bronze or stainless steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
12. Lock shall have self-aligning, thru-bolted trim
13. Levers to operate a roller bearing spindle hub mechanism
14. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
15. Spindle to be designed to prevent forced entry from attacking of lever
16. Provide locksets with 7-pin removable and interchangeable core cylinders
17. Each lever to have independent spring mechanism controlling it
18. Core face must be the same finish as the lockset.

C. Exit Devices:
1. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
2. Exit devices to be tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
3. Exit devices chassis to be investment cast steel, zinc dichromate.
4. Exit devices to have stainless steel deadlocking ¾” through latch bolt.
5. Exit devices to be equipped with sound dampening on touchbar.
6. Non-fire rated exit devices to have cylinder dogging.
7. Non-fire rated exit devices to have ¼” minimum turn hex key dogging.
8. Touchpad to be “T” style constructed of architectural metal with matching metal end caps.
9. Touchbar assembly on wide style exit devices to have a ¼” clearance to allow for vision frames.
10. All exposed exit device components to be of architectural metals and “true” architectural finishes.
11. Provide strikes as required by application.
12. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.

13. Exit device to be heavy investment cast stainless steel. The strike is to be black powder coated finish.
14. Exit devices to have field reversible handing.
15. Provide heavy duty vandal resistant lever trim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
16. Provide 9001-Quality Management and 14001-Environmental Management.
17. Vertical Latch Assemblies to have gravity operation, no springs.
18. Approved Manufacturers
    a. The following manufacturers will be approved contingent on meeting or exceeding the above performance criteria:
    b. Precision Manufactured by Stanley Security Solutions

D. Cylinders:
1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
3. Coordinate and provide as required for related sections.

E. Door Closers shall:
1. Tested and approved by BHMA for ANSI 156.4, Grade 1
2. UL10C certified
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Closer shall have extra-duty arms and knuckles
5. Conform to ANSI 117.1
6. Maximum 2 7/16 inch case projection with non-ferrous cover
7. Separate adjusting valves for closing and latching speed, and backcheck
8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
9. Full rack and pinion type closer with 1½“ minimum bore
10. Mount closers on non-public side of door, unless otherwise noted in specification
11. Closers shall be non-handed, non-sized and multi-sized.

F. Low Energy Operators shall:
1. Conform to ANSI/BHMA A156.19 as a low energy power opening device.
2. Be listed under UL228, UL325, UL10B, UL10C, UBC 7.2 and FCC listed.
3. Shall be non-handed.
4. Be rated for door panels weighing up to 350 lbs (160 kg).
5. The manual door closer within the Low Energy Operator shall be adjusted to meet Americans with Disabilities Act (ADA) 5 lbs opening force (Push-Side applications only).
6. Operator shall be isolated from mounting plate with rubber mounts to mitigate the transmission of forces between the door and the operator.
7. Shall have a position encoder to communicate with microprocessor.
8. Incorporate a resettable powered operation counter that tracts both powered and non-powered cycling of the Operator.
9. Incorporate the following adjustable settings:
    a. Hold Open Timer, to 28 seconds
    b. Open Speed

c. Backcheck Speed
d. Vestibule Sequence Timer
   1) Include DIP switch controls for:
      (a) On board diagnostics
      (b) Power close
      (c) Push and Go operation
      (d) Time delay logic for electrified hardware components
   2) Include terminals for auxiliary controls including:
      (a) Activation devices; provide two discrete inputs
      (b) Vestibule sequencing
   3) Control switches including:
      (a) Day/Night open (illuminated)
      (b) Power On-Off
   4) Includes adhesive Low Energy Operator mounting templates.
   5) R-14 Aluminum Allow Materials
   6) For non-powered operation, the unit shall function as a standard door closer with adjustable spring force size 1 thru 6.

G. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.
   1. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
   2. Provide fastener suitable for wall construction.
   3. Coordinate reinforcement of walls where wall stop is specified.
   4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered

H. Over Head Stops: Provide a Surface mounted or concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.
   1. Concealed overhead stops shall be heavy duty stainless steel.
   2. Surface overhead stops shall be heavy duty stainless steel.

I. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.

J. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plates with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.

K. Kickplates: Provide with four beveled edges ANSI J102, 6 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.

L. Mop plates: Provide with four beveled edges ANSI J103, 6 inches high by width less 1 inch on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.

M. Door Bolts: Flush bolts for wood or metal doors.
   1. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 25 for hollow metal label doors.
   2. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 27 at wood label doors.
   3. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
   4. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.

5. Box shall include a key lock.

N. Power Transfer: Power transfer device shall be a steel housing and flexible tube. Secure and inconspicuous channel is to bring power from the frame to the door.
   1. Precision EPT-12C
   2. Tube shall contain 12 Wire bundle with Stanley Quick Connect Connectors one 4 wire connector consisting of two 18AWG wires and 2 24AWG wires and one 8 wire connector with 8 24AWG wires.

O. Electric Door Strike: Certified by ANSI/BHMA 156.31, Grade 1. and listed for Burglary Protection ANSI/ UL1034 Grade 1.
   1. For General use provide fail-secure electric strike and with fire-rated device.
   2. Listed UL10C for Fire Door assemblies
   3. Latchbolt monitor switch option when specified in hardware sets.
   4. Provide the electric strike in the appropriate model that will accept a 5/8” or 3/4" latchbolt.

P. Door Position Switch: Provide door position switch for door status monitoring as indicated in hardware sets.
   1. At all fired rated doors the door and frames, position switch preparation will be provided by the door and frame manufacturer or by an authorized label service agent.
   2. Retain one of two options in both subparagraphs below. First value is from BHMA standard. Second value is available from domestic manufacturers as standard.

Q. Magnetic Door Holders: Provide magnetic door holders with Tri-Voltage that can be wired 12VDC, 24V AC/DC or 120V AC
   1. Wall magnetic door holders shall be recessed mounted.
   2. Armature shall be thru-bolted and can be provided with any projection required.
   3. Models will be available in US28, sprayed finishes and US32D.
   4. Floor mounted shall be provided for a single door or double door hold open application.

R. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.

S. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.
   1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Silicone)
   2. UL10C Positive Pressure rated seal set when required.

T. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.
   1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Silicone)
   2. UL10C Positive Pressure rated seal set when required.

U. Thresholds: Thresholds shall be aluminum beveled type with maximum height of ½” for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.

V. Provide one wall mounted Telkee, Lund or MMF series key cabinet complete with hooks, index and tags to accommodate 50% expansion. Must have a Best lock with removable core PATD. Coordinate mounting location with architect.

W. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

2.03 FINISH:

A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products

B. Powder coat door closers to match other hardware, unless otherwise noted.

C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.04 KEYS AND KEYING:

A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.

B. Cylinders, removable and interchangeable core system: Best CORMAX™ Patented 7-pin.

C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."

D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.

E. Furnish keys in the following quantities:
   1. 1 each Grand Masterkeys
   2. 4 each Masterkeys
   3. 2 each Change keys each keyed core
   4. 15 each Construction masterkeys
   5. 2 each Control keys

F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.

G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
   1. Do not proceed until unsatisfactory conditions have been corrected.

3.02 HARDWARE LOCATIONS:

A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
   1. Recommended Locations for Builder’s Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
   2. Recommended locations for Architectural Hardware for flush wood doors (DHI).

3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.03 INSTALLATION:

A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

B. Conform to local governing agency security ordinance.

C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
   1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.

D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use “Riv-Nuts” or similar products.

3.04 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
   1. Check and adjust closers to ensure proper operation.
   2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
      a. Verify levers are free from binding.
      b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
         1) Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.05 SCHEDULE OF FINISH HARDWARE:

MANUFACTURER LIST

Code	Name
AB	ABH Manufacturing Inc.
BE	Best Access Systems
BY	By Others
NA	National Guard
PR	Precision
SD	Stanley Door Closers
SDC	Security Door Controls
ST	Stanley
TR	Trimco

3.06 OPTION LIST

Code	Description
C	QUICK CONNECT WIRING OPTION
C	Quick Connect Wiring System

N	S/Steel Components (1000/7000//9000)
22	LENGTH CODE-1 3/8"
BT	BALL TIP HINGES
C4	CAM-STANDARD CAM
CD	CYLINDER DOGGING
FL	Fire Exit Hardware
M5	GALVANIZED STEEL CHAIN
3RO	Prefix option for 2000 Apex Series
B4E	BEVELED 4 EDGES - KICK PLATES
CSK	COUNTER SINKING
LBR	LESS BOTTOM ROD
MLR	MOTORIZED LATCH RETRACTION
TDS	TOUCHBAR MONITORING
VIN	Visual Indicator
VIT	Visual Indictor Thumb-Turn
R705	STRAIGHT CYLINDER RING - 5/16"
R706	STRAIGHT CYLINDER RING - 3/8"
7/8"LTC	7/8" Lip-To-Center Strike
1/4-20-2" COMBO	1/4-20 X COMBO MS/ANCHOR (SS)

3.07 FINISH LIST

Code	Description
313	Dark Bronze Duranodic
600	Primed for Painting
612	Satin Bronze, Clear Coated
613	Oxidized Satin Bronze, Oil Rubbed
626	Satin Chromium Plated
691	Light Bronze Painted
US10	Dull Bronze
US10B	Dull Bronze, Oxidized and Oil Rubbed
US32D	Stainless Steel, Dull

END OF SECTION

SECTION 08 7102
HARDWARE SETS

SET #1

DOORS: VM02A, STH201A, STM300A

	Hinges	by Door Manufacturer		
1	Power Transfer	by Door Manufacturer		
1	Removable Mullion	KR822	600	PR
1	Rim Cylinder (Mullion)	12E-72 PATD R706	612	BE
1	Exit Device	3RO C MLR 2103	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
1	Mortise Cylinder (Dogging)	1E-74 PATD C4 R705	612	BE
2	Classic Pull Plate	16	612	TR
2	Door Closer	CLD-4550 HCS	691	SD
2	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Exit Device	3RO 2101 CD	612	PR
2	Wire Harness	WH-6E		ST
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Set Weather seals	by Door Manufacturer		BY
1	Mullion Seal	5100 S		NA
1	Door Sweep	by Door Manufacturer		BY
1	Threshold	by Door Manufacturer		BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #2

DOORS: NOT USED

6	Hinges	BT CB199 6 x 6 NRP	US10	ST
1	Power Transfer	EPT-12C		PR
1	Removable Mullion	KR822	600	PR
1	Rim Cylinder (Mullion)	12E-72 PATD R706	612	BE
1	Exit Device	3RO 2101 CD	612	PR
1	Exit Device	3RO C MLR TDS 2103	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
2	Classic Pull Plate	16	612	TR
1	Low Energy Operator	CLD-4990 X PS490	313	SD
1	Actuator/Transmitter Package	CL4976		SD
2	Surface Mounting Box	CL4638		SD
1	Door Closer	CLD-4550 HCS	691	SD
2	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Wire Harness	WH-6E		ST

1	Mullion Seal	5100 S		NA
1	Set Weather seals	By Door Manufacturer		BY
1	Door Sweep	By Door Manufacturer		BY
1	Threshold	By Door Manufacturer		BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

Push button switches are activated by card reader . Card reader is used to activate/ deactivate auto-operator

SET #3

DOORS: MV101C

3	Hinges	by Door Manufacturer		
1	Power Transfer	by Door Manufacturer		
1	Exit Device	3RO C MLR TDS 2103	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
1	Classic Pull Plate	16	612	TR
1	Low Energy Operator	CLD-4990 X PS490	313	SD
1	Actuator/Transmitter Package	CL4976		SD
2	Surface Mounting Box	CL4638		SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Wire Harness	WH-6E		ST
1	Set Weather seals	by Door Manufacturer		BY
1	Door Sweep	by Door Manufacturer		BY
1	Threshold	by Door Manufacturer		BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

Push button switches are activated by card reader . Card reader is used to activate/ deactivate auto-operator.

SET #4

DOORS: VM03, M130C

3	Hinges	by Door Manufacturer		
1	Power Transfer	by Door Manufacturer		
1	Exit Device	3RO C MLR 2103	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
1	Classic Pull Plate	16	612	TR
1	Door Closer	CLD-4550 CS	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Wire Harness	WH-6E		ST

1	Set Weather seals	By Door Manufacturer	BY
1	Door Sweep	By Door Manufacturer	BY
1	Threshold	By Door Manufacturer	BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #5

DOORS: M302

6	Hinges	BT CB199 4 1/2 x 4 1/2 NRP	US10	ST
2	Flush Bolt	3917-12	612	TR
1	Dustproof Strike	3911	612	TR
1	Wireless Lockset	by Security Contractor	612	
1	Door Closer	CLD-4550 CS	691	SD
2	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Overhead Holder	N 1010 A Series	US10	AB
1	Saddle Threshold	425 DKB 1/4-20-2" COMBO	AL	NA
1	Weather strip	700 ESDKB @ HEAD & JAMBS		NA
2	Door Sweep	200 NDDKB		NA
1	Astragal	148 NDKB		NA

NOTE: Card Reader both inside and outside.

SET #6

DOORS: STM200

6	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
1	Power Transfer	EPT-12C		PR
1	Exit Device	3RO FL 2202 X 4902D LBR	612	PR
1	Exit Device	3RO C FL MLR 2203 X 4903D LBR	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
2	Door Closer	CLD-4550 EDA	691	SD
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
2	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Wire Harness	WH-6E		ST
1	Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #7

DOORS: VM02B

6	Hinges	BT CB168 4 1/2 X 4 1/2	US10	ST

2	Dummy Touch bar	671DR	US10	PR
2	Classic Door Pull	16	US10	TR
2	Door Closer	CLD-4550 CS	691	SD
2	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

SET #8

DOORS: STM 101, STM201, STM203, STM300, STM301, STM302

6	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2	Power Transfer	EPT-12C		PR
2	Exit Device	3RO C FL MLR 2103 X 4903D	612	PR
2	Rim Cylinder	12E-72 PATD	612	BE
2	Door Closer	CLD-4550 EDA	691	SD
2	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
2	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
2	Wire Harness	WH-192P		ST
2	Wire Harness	WH-XXP Length as req'd		ST
2	Wire Harness	WH-6E		ST
2	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device. Holdback latcbolt at STM101.

SET #9

DOORS: STM104

3	Hinges	BT CB168 5 X 4 1/2 NRP	US10	ST
1	Power Transfer	EPT-12C		PR
1	Exit Device	3RO C FL MLR 2103 X 4903D	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
1	Door Closer	CLD-4550 EDA	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Wire Harness	WH-6E		ST
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device. .

SET #10

DOORS: M002, M038B, M042, CM03

3	Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1	Wireless Lockset	by Security Contractor		BY
1	Cylinder	12E-72 PATD / 1E-74 PATD as re'd	612	BE
1	Door Closer	CLD-4550 EDA	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	By Security Contractor		BY
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #11

DOORS: M109A, M109B, M204, M227

3	Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1	Wireless Lockset	by Security Contractor		BY
1	Cylinder	12E-72 PATD / 1E-74 PATD as req'd	612	BE
1	Door Closer	CLD-4550 EDA H.O.	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	by Security Contractor		BY
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #12

DOORS: M005, M011, M018, M030, M101C

3	Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1	Wireless Lockset	by Security Contractor		BY
1	Door Closer	CLD-4550 EDA	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #13

DOORS: M120, M122, M122

3	Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1	Wireless Lockset	by Security Contractor		BY

1	Door Closer	CLD-4550 EDA HO	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

Stop/Hold Open arm at Door M122.

SET #14

DOORS: M115

1	Wireless Lockset	by Security Contractor	612	

NOTE: Existing Hardware to Remain

SET #15

DOORS: M007, M017, M032

3	Hinges	BT CB179 4 1/2 X 4 1/2	US10	ST
1	Wireless Lockset (Privacy)	by Security Contractor		BY
1	Door Closer	CLD-4550 EDA	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #16

DOORS: M101A, M101B

3	Hinges	BT CB179 4 1/2 X 4 ½ NGP	US10	ST
1	Wireless Lockset	by Security Contractor	612	
1	Electric Strike	ES5 B LBM/LCM	612	BE
1	Mini Console	DTMO2		SDC
1	Power Supply	632RF	PTD	SDC
1	Door Closer	CLD-4550 CS	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Push button at console located in Office M101 releases electric strike for authorized access. Egress at all times via lockset.

SET #17

DOORS: M038A, M043, M136, M138, M140, M142

6	Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST

2	Flush Bolt	3917-12	612	TR
1	Dustproof Strike	3911	612	TR
1	Wireless Lockset	by Security Contractor		BY
1	Door Closer	CLD-4550 EDA	691	SD
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
2	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
2	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #18

DOORS: M014, M102, M106, M116, M118, M126

3	Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1	Wireless Lockset	by Security Contractor		BY
1	Door Closer	CLD-4550 CS	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #19

DOORS: MV102A, MV102B, MV102C, MV103A, M103B, MV103C, M214A, M214B, M214C, M214D

4	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2	Power Transfer	EPT-12C		PR
1	Exit Device	3RO C MLR 2203 X 4903D LBR	612	PR
1	Exit Device	3RO MLR 2202 X 4902D LBR	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
2	Door Closer	CLD-4550 CS HO	691	SD
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
2	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	by Security Contractor (at MV103C & M214A)		BY
1	Power Supply	RPSMLR2		PR
2	Wire Harness	WH-192P		ST
2	Wire Harness	WH-XXP Length as req'd		ST
2	Wire Harness	WH-6E		ST
1	Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA
2	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device. Latchbolt hold back electrically via security system.

SET #20

DOORS: M117

4	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2	Power Transfer	EPT-12C		PR
1	Exit Device	3RO C MLR FL2203 X FL4903D LBR	612	PR
1	Exit Device	3RO MLR 2202 X FL4902D LBR	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
2	Door Closer	CLD-4550	691	SD
2	Magnetic Holders	2300 Extension as req'd	691	ABH
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
1	Card Reader	by Security Contractor (at MV103C & M214A)		BY
1	Power Supply	RPSMLR2		PR
2	Wire Harness	WH-192P		ST
2	Wire Harness	WH-XXP Length as req'd		ST
2	Wire Harness	WH-6E		ST
1	Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

Doors can be held open via magnetic holders which are wired to the building emergency system.

SET #21

DOORS: NOT USED

6	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2	Flush Bolt	3917-12	612	TR
1	Dustproof Strike	3911	612	TR
1	Wireless Lockset	By Security Contractor		BY
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
2	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
2	Overhead Holder	N 1010 A Series	US10	AB
1	Smoke Seal	5020C @ HEAD & JAMBS		NA
1	Astragal Set	9675 DKB @ FACE OF EACH LEAF	NA	

SET #22

DOORS: M103, M209, M110, M205B

3	Hinges	BT CB168 4 1/2 X 4 ½ NRP	US10	ST
1	Wireless Lockset	by Security Contractor		BY
1	Electric Strike	ES5 B LBM/LCM	612	BE
1	Low Energy Operator	CLD-4990 X PS490	313	SD
1	Actuator/Transmitter Package	CL4976		SD
2	Surface Mounting Box	CL4638		SD

1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1	Card Reader	by Security Contractor		BY
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Operational description: wireless lockset is locked/unlocked via card or key. Card reader activates auto operator and HC push switches both inside and outside of classroom. When auto operator is activated HC push switches will release electric strike-slight delay-activate auto operator.

SET #23

DOORS: M016, M020, M022, M028, M203, M205A, M206, M207, M211, M213A, M213B, M217A, M217B, M219A, M219B, M223, M224, M225, M150

3	Hinges	BT CB168 4 1/2 X 4 ½ NRP	US10	ST
1	Wireless Lockset	by Security Contractor		BY
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Wall Stop	1270CX / 1211 as req'd	US10	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

SET #24

DOORS: MV101A, MV101B

3	Hinges	BT CB199 5 X 4 1/2 NRP	US10	ST
1	Power Transfer	EPT-12C		PR
1	Exit Device	3RO C MLR 2103	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
1	Classic Pull Plate	16	612	TR
1	Door Closer	CLD-4550 CS	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Card Reader	By Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length AS REQ,D		ST
1	Wire Harness	WH-6E		ST
1	Saddle Threshold	425 DKB 1/4-20-2" COMBO	AL	NA
1	Weather strip	700 ESDKB @ HEAD & JAMBS		NA
1	Door Sweep	200 NDDKB		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device. Electrically latchbolt at Doors MV101A & MV101B

SET #25

DOORS: M034, M036, M042

	Hinges	by Door Manufacturer	US10	
1	Wireless Lockset	by Security Contractor	612	
1	Door Closer	CLD-4550 CS	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Card Reader	By Security Contractor		BY
1	Threshold	by Door Manufacturer	AL	NA
1	Weather strip	by Door Manufacturer		NA
1	Door Sweep	by Door Manufacturer		NA

NOTE: Access via Card Reader or mechanical key. Lock trim at Door M034 to be fail-safe, becomes unlocked in a building emergency.

SET #26

DOORS: NOT USED

6	Hinges	BT CB168 4 1/2 X 4 1/2	US10	ST
1	Exit Device	3RO FL 2201 X 4901 LBR	612	PR
1	Exit Device	3RO FL 2214 X 4914D LBR	612	PR
2	Door Closer	CLD-4550 EDA	691	SD
2	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
2	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
2	Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA
1	Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA

SET #27

DOORS: M001A, M001B, M009A, M009B, M134A, M134B

6	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
1	Power Transfer	EPT-12C		PR
1	Exit Device	3RO FL 2202 X 4902D LBR	612	PR
1	Exit Device	3RO C FL MLR 2203 X 4903D LBR	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
1	Door Closer	CLD-4550 CS	691	SD
1	Door Closer	CLD-4550 EDA	691	SD
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
1	Wall Bumper	1270CX / 1211 as req’d	612	TR
1	Card Reader	By Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req’d		ST

1	Wire Harness	WH-6E		ST
1	Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #28

DOORS: M024, M026

6	Hinges	BT CB199 4 1/2 X 4 1/2 NRP	US10	ST
1	Dustproof Strike	3911	612	TR
2	Flush Bolt	3917-12	612	TR
1	Wireless Lockset	by Security Contractor	612	
1	Door Closer	CLD-4550 CS	691	SD
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
1	Overhead Holder	N 1010 A Series	US10	AB
1	Gasketing	5020C		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #29

DOORS: M031, M104, M104B, M106.1, M106A, M205.1, M205.2, M205.3, M217.1

3	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
1	Wireless Lockset	By Security Contractor		BY
1	Wall Stop	1270CX / 1211 as req'd	US10	TR
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

Note: Double credential reader at Door M106A

SET #30

DOORS: M038C, M044, M216

3	Hinges	BT CB179 4 1/2 X 4 1/2	US10	ST
1	Wireless Lockset	By Security Contractor		BY
1	Door Closer	CLD-4551 REG	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

Note: Hold Open (HO) at Door M216

SET #31

DOORS: STM004, M009A, M009B, M105A, M105B, M111A, M111B

3	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
1	Power Transfer	EPT-12C		PR
1	Exit Device	3RO C FL MLR 2103 X 4903D	612	PR

1	Rim Cylinder	12E-72 PATD	612	BE
1	Door Closer	CLD-4550 EDA	691	SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	By Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Wire Harness	WH-6E		ST
1	Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #32

DOORS: M107

6	Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2	Power Transfer	EPT-12C		PR
2	Exit Device	3RO C FL MLR 2103 X 4903D	612	PR
2	Rim Cylinder	12E-72 PATD	612	BE
2	Door Closer	CLD-4550 EDA	691	SD
2	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
2	Wall Bumper	1270CX / 1211 as req'd	612	TR
1	Card Reader	by Security Contractor		BY
1	Power Supply	RPSMLR2		PR
2	Wire Harness	WH-192P		ST
2	Wire Harness	WH-XXP Length as req'd		ST
2	Wire Harness	WH-6E		ST
2	Smoke Seal	5020C @ HEAD & JAMBS		NA

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers: Sealant and back-up material.

B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

C. Section 08 1433 - Stile and Rail Wood Doors: Glazed lites in doors.

D. Section 08 5200 - Aluminum Clad Wood Windows: Glazing furnished by window manufacturer.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.

C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2011.

D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

F. ASTM C1036 - Standard Specification for Flat Glass; 2011.

G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

J. GANA (GM) - GANA Glazing Manual; 2009.

K. GANA (SM) - GANA Sealant Manual; 2008.

L. ICC (IBC) - International Building Code; 2015.

M. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2004).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

D. Samples: Submit two samples __ by __ inch in size of glass and plastic units, showing coloration and design.

E. Certificates: Certify that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

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 7800 - Closeout Submittals, for additional warranty requirements.

B. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

C. Laminated Glass: Provide a ten (10) year warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.01 GLAZING UNITS

A. Type 1: NOT USED

B. Type 2 - Single Safety Glazing: Non-fire-rated.
   1. Applications: Provide this type of glazing in the following locations:
      a. Glazed lites in doors, except fire doors.
      b. Glazed sidelights to doors, except in fire-rated walls and partitions.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on the drawings.
   2. Type: Laminated safety glass as specified.
   3. Tint: Clear
   4. Thickness: 1/4 inch (6mm).

C. Type 3 - Single Safety Glazing: Non-fire-rated.
   1. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in doors, except fire doors.
      b. Glazed sidelights to doors, except in fire-rated walls and partitions.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on the drawings.
   2. Type: Fully tempered float glass as specified.
   3. Tint: Clear.
   4. Thickness: 1/4 inch.

D. Type 4 - Wire Glass, Safety-Rated. (NOT USED)

E. Type 5 - Single Vision Glazing:
   1. Applications: All interior glazing unless otherwise indicated.
   2. Type: Annealed float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch.

F. Type 6A - Fire-Rated Safety Glazing - 20 minute:

1. Applications: Provide this type of glazing in the following locations:
   a. Glazed lites in doors having a 20 minute fire rating.
   b. Other locations indicated on the drawings.
2. Manufacturer and Product:
   a. Technical Glass Products Fireglass20: www.fireglass.com
   b. Safti-First SuperLite I-W: safti.com: safti.com
   c. Substitutions: See Section 01 6000.
3. Fire Rating: 20 minutes, without hose stream test.
4. Type: fire-rated and impact safety-rated glazing material.
5. Thickness: 1/4 inch.
6. Impact safety rating: ANSI Z97.1 and CPSC 16CFR1201 (Cat I and II)
7. Glazing Method: As required for fire rating.

G. Type 6B - Fire-Rated Safety Glazing - 20 minute:
1. Applications: Provide this type of glazing in the following locations:
   a. Sidelights, borrow lites, and other glazed openings in partitions indicated as having a 1/2 hour fire rating.
   b. Other locations indicated on the drawings.
2. Manufacturer and Product:
   a. Technical Glass Products Pilkington Pyrostop 45: www.fireglass.com
   b. Safti-First SuperLite II-XL 45: safti.com
   c. Substitutions: See Section 01 6000.
3. Fire Rating: 20 minutes, with hose stream test.
4. Type: high visible light transmission glass laminated with an intumescent interlayer..
5. Thickness: 1/2" inch.
6. Impact safety rating: ANSI Z97.1 and CPSC 16CFR1201 (Cat I and II)
7. Light Transmittance: 85 percent, nominal.
8. Glazing Method: As required for fire rating.

H. Type 7 - Fire-Rated Safety Glazing - up to 45 minutes:
1. Applications: Provide this type of glazing in the following locations:
   a. Glazed lites in fire doors with fire ratings higher than 20 minutes.
   b. Fire windows in partitions with fire ratings higher than 1/2 hour.
   c. Sidelights, borrow lites, and other glazed openings, with fire ratings higher than 1/2 hour.
   d. Other locations indicated on the drawings.
2. Manufacturer and Product:
   a. Technical Glass Products; Pilkington Pyrostop 45: www.fireglass.com
   b. Safti-First SuperLite II-XL 45: safti.com
   c. Substitutions: See Section 01 6000.
3. Fire Rating: up to 45 minutes; with hose stream test .
   a. IBC fire resistance rating: D-H-NT-45 for glazing in doors, sidelites and transoms.
4. Type: high visible light transmission glass laminated with an intumescent interlayer..
5. Thickness: 1/2 inch.
6. Impact safety rating: ANSI Z97.1 and CPSC 16CFR1201 (Cat I and II)
7. Light Transmittance: 86 percent, nominal.
8. Glazing Method: As required for fire rating. Provide 5/8" glazing stops.

I. Type 7A - Fire-Rated Insulated Glass Units - 45 minutes:
1. Applications: Provide this type of glazing in the following locations:

a. Glazed transom lights above fire stair exit doors.
2. Manufacturer and Product: Pillkington Pyrostop 45-260
a. Nominal thickness: 1- 5/16 inch.
b. U-Value: 0.49
c. Substitutions: See Section 016000.

2.02 GLASS MATERIALS

A. Float Glass Manufacturers:
1. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.
2. Guardian Industries Corp: www.sunguardglass.com.
3. Pilkington North America Inc: www.pilkington.com/na.
4. PPG Industries, Inc: www.ppgideascapes.com.
5. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Float Glass: Provide float glass based glazing unless noted otherwise.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
3. Tinted Types: ASTM C1036, Class 2 - Tinted, color and performance characteristics as indicated.
4. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

C. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
2. Plastic Interlayer:
3. Where fully tempered is specified or required, provide glass that has been tempered by the tong-less horizontal method.
4. Manufacturers:
a. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.
b. Cardinal Glass Industries: www.cardinalcorp.com.
c. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
d. Substitutions: Refer to Section 01 6000 - Product Requirements.

D. Fire Resistance-Rated Glazing: Type, thickness, and configuration as required to achieve indicated ratings.
1. IBC Fire Resistance Rating: W-45, minimum.
2. Provide products listed by Underwriters Laboratories or Intertek Warnock Hersey.
3. Safety Certification: 16 CFR 1201 Category II.
4. Products:
a. Technical Glass Products; Pilkington Pyrostop: www.fireglass.com.
b. SAFTI FIRST, a division of O'Keeffe's Inc; SuperLite II-XL: www.safti.com.
c. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.03 GLAZING COMPOUNDS

A. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; grey color.

B. Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C920, Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

C. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.

D. Glazing Splines: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; color to match framing.

E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealants in accordance with manufacturer's instructions.

3.03 GENERAL

A. Manufacturer's Instructions: Follow in executing all glazing work.

B. Sizing: Obtain final sizes for all glass by job measurement.

C. Preparation: Check all openings prior to glazing to ascertain that opening is square, plumb and secure. Clean all surfaces that will receive glazing materials with cleaner as recommended by manufacturer; wipe dry.

D. Windows: Install spacers, shims and setting blocks as recommended by glass manufacturer. Install sealants, glazing tape, vision strips, etc., as recommended by glass manufacturer.

3.04 INSTALLATION

A. Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.

B. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.

C. Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.

1. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
2. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

D. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.

E. Place setting blocks located at quarter points of glass with edge block no more than 6 inches from corners.

F. Glaze vertically into labeled fire-rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.

G. Place glazing tape on free perimeter of glazing in same manner described above.

H. Install removable stop and secure without displacement of tape.

I. Use specified glazing compound, without adulteration; bed glazing material in glazing compound; entirely fill all recess and spaces. Provide visible glazing compound with smooth and straight edges.

J. Install in vision panels in fire-rated doors to requirements of NFPA 80.

K. Install so that appropriate markings remain permanently visible.

L. Follow glazing size limits, stop size per manufacturer recommendations.

3.05 INSTALLATION

A. Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.

B. INSTALLATION
1. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.

D. Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.
1. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
2. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

E. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.

3.06 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.07 LABELING

A. Each piece of fire-rated glazing shall be permanently labeled with the appropriate manufacturer's logo, UL logo and fire rating.

B. Each piece of safety-rated glazing shall be permanently labeled with the appropriate manufacturer's logo and safety rating.

3.08 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 9100
LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Louvers, frames, and accessories.

1.02 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

B. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2012.

C. AMCA 511 - Certified Ratings Program for Air Control Devices; 2010.

D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

1.03 SUBMITTALS

A. See Section 01 3000 - 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 and interior surfaces.

E. Test Reports: Independent agency reports showing compliance with specified performance criteria.

PART 2 PRODUCTS

2.01 LOUVERS

A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
   1. Wind Load Resistance: Design to resist positive and negative wind load of 25 psf without damage or permanent deformation.
   2. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
   3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
   4. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

B. Stationary Louvers: Horizontal blade, extruded aluminum construction, with intermediate mullions matching frame.
   1. Free Area: 50 percent, minimum.
   2. Blades: Straight.
   3. Frame: 4 inches deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.

4. Aluminum Thickness: Frame 12 gage, 0.0808 inch minimum; blades 12 gage, 0.0808 inch minimum.
5. Aluminum Finish: Class II natural anodized; finish welded units after fabrication.

2.02 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), ____ alloy, ____ temper.

2.03 FINISHES

A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
   1. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil; color and gloss as indicated on drawings.

2.04 ACCESSORIES

A. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.

B. Bird Screen: Interwoven wire mesh of steel, 14 gage, 0.0641 inch diameter wire, 1/2 inch open weave, diagonal design.

C. Insect Screen: 18 x 16 size aluminum mesh.

D. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.

E. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

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.

END OF SECTION

SECTION 09 0561
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:
   1. Resilient tile.
   2. Broadloom carpet.
   3. Carpet tile.

B. Removal of some existing floor coverings.

C. Preparation of existing concrete floor slabs for installation of floor coverings.

D. Testing of existing concrete floor slabs for moisture and alkalinity (pH) has already been conducted; test report is attached.

E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (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 RELATED REQUIREMENTS

A. Section 03 5400 - Cast Underlayment: Self-leveling underlayment applied as remediation treatment.

1.03 REFERENCES

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.

E. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (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.

D. Adhesive Bond and Compatibility Test Report.

E. Copy of RFCI (RWP).

F. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
   1. Manufacturer's installation instructions.
   2. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing will be performed by an independent testing agency employed and paid by Owner.

B. Contractor may perform adhesive and bond test with his own personnel or hire a testing agency.

C. 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.

D. 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.

E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.08 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. 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 alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. If testing agency recommends any particular products, use one of those.
   2. Products:
      a. Refer to Section 03 5400 - Cast Underlayment

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering.
   2. Preliminary cleaning.
   3. 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.
   4. Alkalinity (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 Alkalinity (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 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 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.

3.04 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.

3.05 ALKALINITY 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. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

C. Use a wide range alkalinity (pH) test 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 alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (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 alkalinity (pH) 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 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.

B. Metal channel ceiling framing.

1.02 RELATED REQUIREMENTS

A. Section 07 2100 - Thermal Insulation: Acoustic insulation.

B. Section 07 9005 - Joint Sealers: Acoustic sealant.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.

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; 2015.

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

G. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on metal framing and accessories.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum __ years of experience.

PART 2 PRODUCTS

2.01 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
   2. Marino: 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/120 at 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 with knurled faces.
   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. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.

D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   4. Deflection and Firestop Track:
      a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
      b. Products:
         1) FireTrak Corporation; Posi Klip.
         2) Metal-Lite, Inc.; The System.
         3) Substitutions: See Section 01 6000 - Product Requirements.

F. Preformed Top Track Firestop Seal:
   1. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   2. Products:
      a. Hilti, Inc; Top Track Seal CFS TTS: www.us.hilti.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACCESSORIES

A. Acoustic Insulation: As specified in Section 07 2100.

B. Acoustic Sealant: As specified in Section 07 9005.

C. Finishing Accessories: ASTM C1047, rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.

D. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

E. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

F. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   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 at 16 inches on center.
   1. Extend partition framing to structure in typical conditions.
   2. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09 2236.23
METAL LATH

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lath for gypsum plaster.

B. Furring for metal lath.

C. Metal ceiling framing.

1.02 RELATED REQUIREMENTS

A. Section 09 2300 - Gypsum Plastering.

1.03 REFERENCE STANDARDS

A. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring; 2003 (Reapproved 2013).

B. ASTM C847 - Standard Specification for Metal Lath; 2014a.

C. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

D. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

E. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2015a.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on furring and lathing components, structural characteristics, material limitations, and finish.

C. Samples:

1. Submit two samples, 2 by 6 inch in size illustrating linear materials and finish.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section a minimum five years documented experience.

PART 2 PRODUCTS

2.01 FRAMING MATERIALS

A. Furring Channels: Formed steel, minimum 0.020 inch thick, 3/8 inch deep by 7/8 inch high, splicing permitted; galvanized.

B. Main Ceiling Channels: Formed steel, minimum 0.05 inch thick, 3/4 inch deep by 1-1/2 inch high, single piece, no splicing; galvanized.

C. Hangers: Steel wire, of size and type to suit application, to support ceiling components in place to deflection limits as indicated.

D. Ceiling Hangers: Rolled steel sections, of size and type to suit application, to rigidly support ceiling components in place to deflection limits as indicated; galvanized.

E. Lateral Bracing: Formed steel, minimum 0.060 inch thick, size and length as required; galvanized.

2.02 LATH

A. Ribbed Metal Lath: ASTM C847, galvanized; 3/8 inch thick.
   1. Weight: To suit application and as specified in ASTM C841 or ASTM C1063 for framing spacing.

B. Corner Mesh: Formed sheet steel, minimum 0.018 inch thick, perforated flanges shaped to permit complete embedding in plaster, minimum 2 inch size; same finish as lath.

C. Strip Mesh: Expanded metal lath, same weight as lath, 2 inch wide by 24 inch long; same finish as lath.

D. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, and maximum possible lengths.
   1. Material: Formed zinc, expanded metal flanges.
   2. Casing Beads: Square edges.
   3. Corner Beads: Radiused corners.
   4. Base Screeds: Bevelled edges.
   5. Expansion Joints: Two-piece sliding type with reveal, 2 inch wide flanges.

2.03 ACCESSORIES

A. Anchorage: Tie wire, nails, and other metal supports, of type and size to suit application; to rigidly secure materials in place, galvanized.

B. Fasteners: Self-piercing tapping screws; ASTM C1002 or ASTM C954.

C. Tie Wire: Annealed galvanized steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that substrates are ready to receive work and conditions are suitable for application.

C. Do not begin until unacceptable conditions have been corrected.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION - GENERAL

A. Install interior lath and furring for gypsum plaster in accordance with ASTM C841.

3.03 WALL FURRING INSTALLATION

A. Install furring channels horizontally; secure with fasteners on alternate channel flanges at maximum 24 inches on center.

B. Space furring channels maximum 16 inches on center, and not more than 4 inches away from floor and ceiling lines.

3.04 CEILING AND SOFFIT FRAMING **INSTALLATION**

A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.

B. Install furring independent of walls, columns, and above-ceiling work.

C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.

D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.

E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

F. Install furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.

G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.

H. Laterally brace suspension system.

3.05 LATH INSTALLATION

A. Apply metal lath taut, with long dimension perpendicular to supports.

B. Lap ends minimum 1 inch. Secure end laps with tie wire where they occur between supports.

C. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.

D. Place corner bead at external wall corners; fasten at outer edges of lath only.

E. Place base screeds at termination of plaster areas; secure rigidly in place.

F. Place 4 inch wide strips of metal lath centered over junctions of dissimilar backing materials, and secure rigidly in place.

G. Place lath vertically above each top corner and each side of door frames to 6 inches above ceiling line.

H. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.

I. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

3.06 TOLERANCES

A. Maximum Variation from True Lines and Levels: 1/8 inch in 10 feet.

B. Maximum Variation from True Position: 1/8 inch.

END OF SECTION

SECTION 09 2300
GYPSUM PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gypsum plaster over metal lath, masonry, and other solid surfaces.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

B. Section 09 2116 - Gypsum Board Assemblies: Metal stud framing and furring for plaster.

C. Section 09 2236.23 - Metal Lath: Metal lath, furring, and accessories for plaster base.

1.03 REFERENCE STANDARDS

A. ASTM C28/C28M - Standard Specification for Gypsum Plasters; 2010.

B. ASTM C631 - Standard Specification for Bonding Compounds for Interior Gypsum Plastering; 2009 (Reapproved 2014).

C. ASTM C842 - Standard Specification for Application of Interior Gypsum Plaster; 2005 (Reapproved 2010).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide data on plaster materials, characteristics, and limitations of products specified.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.06 MOCK-UP

A. Construct mock-up of interior wall, 10 feet long by 10 feet wide, illustrating surface finish.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

PART 2 PRODUCTS

2.01 PLASTER MATERIALS

A. Ready-Mixed Gypsum Plaster: ASTM C28/C28M; mill-mixed type, requiring only the addition of water. For application to monolithic concrete, provide bonding type.

B. Ready-Mixed Finishing Plaster: Gypsum/Lime putty type, ASTM C28/C28M; mixture of gauging plaster and lime.

C. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.

D. Bonding Agent: ASTM C631. Type recommended for bonding plaster to concrete and concrete block surfaces.

2.02 METAL LATH

A. Metal Lath and Accessories: As specified in Section 09 2236.23.

B. Beads, Screeds, and Joint Accessories: Zinc, as specified in Section 09 2236.23.

2.03 PLASTER MIXES

A. Over Metal Lath: Three-coat application, ready-mixed plaster, mixed and proportioned in accordance with ASTM C842 and manufacturer's instructions.

B. Ready-Mixed Plaster Materials: Mix in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing conditions are satisfactory before starting work.

B. Masonry: Verify joints are cut flush and surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.

C. Grounds and Blocking: Verify items within walls for other sections of work have been installed.

D. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

3.02 PREPARATION

A. Dampen masonry surfaces to reduce excessive suction.

B. Clean concrete surfaces of foreign matter. Thoroughly dampen surfaces before using acid solutions, solvent, or detergents to perform cleaning. Wash surface with clean water.

C. Roughen smooth concrete surfaces and smooth faced masonry.

D. Apply bonding agent in accordance with manufacturer's instructions.

3.03 PLASTERING

A. Apply gypsum plaster in accordance with ASTM C842 and manufacturer's instructions.

B. Thickness of Plaster including Finish Coat:
   1. Over metal lath: 5/8 inch.
   2. Direct to unit masonry: 5/8 inch.

C. Finish Texture: Match approved adjacent surface texture.

3.04 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09 2613
GYPSUM VENEER PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gypsum veneer plaster on gypsum veneer base, existing plaster, and other substrates.

B. Gypsum veneer base and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

B. Section 09 2116 - Gypsum Board Assemblies: Metal stud framing and furring for plaster.

C. Section 09 2300 - Gypsum Plastering.

1.03 REFERENCE STANDARDS

A. ASTM C587 - Standard Specification for Gypsum Veneer Plaster; 2004 (Reapproved 2009).

B. ASTM C843 - Standard Specification for Application of Gypsum Veneer Plaster; 1999 (Reapproved 2012).

C. ASTM C844 - Standard Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster; 2015.

D. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

E. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

F. UL (FRD) - Fire Resistance Directory; current edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide data on veneer plaster products.

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

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

1.06 FIELD CONDITIONS

A. Do not apply veneer plaster when substrate or ambient air temperature is less than 50 degrees F nor more than 80 degrees F; for 24 hours prior to, during operations and after, until building heating system can maintain the above minimum temperature.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gypsum Veneer Plaster:
   1. Georgia-Pacific Gypsum LLC: www.gp.com/gypsum.
   2. National Gypsum Company: www.nationalgypsum.com.
   3. USG: www.usg.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 GYPSUM VENEER PLASTER ASSEMBLIES

A. Interior Partitions: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

B. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
   1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
   2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. Fire Rated Partitions: UL listed assembly No. U419; 1 and 2 hour rating.
   2. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.

2.03 MATERIALS

A. Gypsum Veneer Plaster: ASTM C587, mixed in accordance with manufacturer's instructions.

B. Fire-Rated Gypsum Veneer Base: ASTM C1396/C1396M, fire rated Type X; sizes to minimize joints in place; ends square cut.
   1. Thickness: 5/8 inch.
   2. Edges: Tapered.

C. Gypsum Veneer Base Trim Accessories: Zinc-coated steel or plastic, complying with ASTM C1047.

D. Joint Reinforcing for Gypsum Veneer Base: As specified in ASTM C587.

E. Fasteners: As specified in ASTM C844.

F. Bond Coat: ASTM C631, vinyl polymer type, bonding compound.

G. Acoustic Insulation: As specified in Section 07 2100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready to receive work.

B. Verify masonry mortar joints are cut flush; verify surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.

C. Verify gypsum plaster base is flat, smooth and surface is ready to receive work. Verify joint and surface perimeter accessories are in place.

3.02 PREPARATION

A. Clean surfaces of dust or loose matter.

B. Remove projections greater than 1/8 inch and fill depressions greater than 1/4 inch with latex filler.

C. Apply bond coat to prepare masonry surfaces within 24 hours of veneer plaster application. Apply in accordance with manufacturer's instructions.

3.03 INSTALLATION - GYPSUM PLASTER BASE

A. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

B. Install gypsum base in accordance with ASTM C844.

C. Use drywall screws to fasten gypsum base to framing substrate.

D. Single Layer Base:
   1. Install fire rated gypsum board vertical, with ends and edges occurring over firm bearing.
   2. At furred partition faces, place 4 inch wide strip of gypsum board, same thickness as furring, at perimeter of wall openings and partition.

E. Double Layer Base:
   1. Erect first layer of fire rated gypsum board, perpendicular to framing or furring members.
   2. Place second layer of fire rated gypsum board, perpendicular to first layer. Ensure end joints of second layer do not occur over joints of first layer.
   3. Secure second layer with fasteners.

F. Install accessories.

G. Tape, fill, and sand filled joints, edges, corners, openings, and trim to produce surface ready to receive veneer finish.

H. Feather coats onto adjoining surfaces so that joint camber is maximum 1/32 inch.

I. Install acoustical sealant within partition assembly in accordance with manufacturer's instructions.

J. Install acoustical sealant at gypsum board perimeter at:
   1. Metal Framing: Two beads.
   2. Perimeter interruptions.
   3. Seal penetrations of plaster by conduit, pipe, ducts, and rough-in boxes using acoustic sealant, except where firestopping is provided.

3.04 INSTALLATION - VENEER PLASTER

A. Install gypsum veneer plaster in accordance with ASTM C843 and manufacturer's instructions.

B. Dampen masonry surfaces without leaving visible water on surface, to minimize suction from veneer plaster materials. Install veneer plaster immediately after dampening.

C. At All Locations: Apply single coat to a thickness of 1/16 inch.

D. Finish surface to flat, smooth, hard trowel finish.

3.05 TOLERANCES

A. Maximum Variation From Specified Thickness: Plus or minus 1/64 inch.

3.06 PROTECTION

A. Do not permit traffic near unprotected finished surfaces.

END OF SECTION

SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Stone thresholds.

D. Trim.

1.02 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers.

B. Section 09 05 61 - Common Work Results for Flooring Preparation

C. Section 09 2116 - Gypsum Board Assemblies: Installation of tile backer board.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2013.1.

B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2014.

C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

D. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2010).

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).

K. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 2010 (Revised).

L. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior glue plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

M. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).

N. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2012 (Revised).

O. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2010 (Revised).

P. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2012.

Q. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.

R. ASTM C373 - Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products, Ceramic Tiles, and Glass Tiles; 2014a.

S. ASTM D4068 - Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane; 2015.

T. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.

D. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Tile: 10 square feet of each size, color, and surface finish combination.

1.05 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

B. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

A. Quarry Tile: ANSI A137.1, standard grade.
   1. Moisture Absorption: over 3.0 but not more than 5.0 percent as tested in accordance with ASTM C373.

2. Size: 8 by 8 inch, nominal.
3. Thickness: 1/2 inch, nominal.
4. Edges: Square.
5. Surface Finish: Unglazed.
6. Color(s): As scheduled.
7. Trim Units: Matching bullnose and cove base shapes in sizes coordinated with field tile.
8. Products:
   a. Summitville Tiles, Inc: www.summitville.com.

B. Porcelain Floor Tile, Type PFT -1: Basis of Design: Crossville.
1. Size: 12 by 12 inch, nominal, unpolished.
2. Edges: Square.
3. Surface Finish: Natural.
4. Color(s): Empress White, A215.
5. Pattern: Cross Colors.

C. Porcelain Floor Tile, Type PFT -2: Basis of Design: Crossville.
1. Size: 6 by 6 inch, nominal, unpolished.
2. Edges: Square.
3. Surface Finish: Natural.
4. Color(s): Empress White, A215.
5. Pattern: Cross Colors.
6. Trim Units: Matching cove base shapes in sizes indicated.

D. Porcelain Floor Tile, Type PFT -3: Basis of Design: Crossville.
1. Size: 12 by 12 inch, nominal, unpolished.
2. Edges: Square.
3. Color(s): Platinum C810.
4. Pattern: Cross Colors.

E. Porcelain FLoor Tile, Type PFT -4: Basis of Design: Crossville.
1. Size: 6 by 6 inch, nominal, unpolished.
2. Edges: Square.
3. Color(s): Platinum C810.
4. Pattern: Cross Colors.

F. Porcelain Floor Tile, Type PFT -5: Basis of Design: Crossville.
1. Size: 12 by 12 inch, nominal, unpolished.
2. Edges: Square.
3. Color(s): Oceana B580.
4. Pattern: Cross Colors.

G. Porcelain Floor Tile, Type PFT -6: Basis of Design: Crossville.
1. Size: 6 by 6 inch, nominal, unpolished.
2. Edges: Square.
3. Color(s): Oceana B580.
4. Pattern: Cross Colors.

H. Porcelain Floor Tile, Type PFT -7: Basis of Design: Marco Corona.
1. Size: 10 by 8.5 inch, nominal.
2. Edges: Square.
3. Color(s): Ter. Porzione Ver. F.
4. Pattern: Terra.

I. Porcelain Wall Tile, Type PWT-1, PWT-2, PWT-3, PWT-4: ANSI A137.1, and as follows:
   1. Cross Colors manufactured by Crossville .
   2. Size and Shape: various sizes.
   3. Edges: Square.
   4. Surface Finish: polished.
   5. Color(s): As scheduled.

J. Ceramic Wall Tile, Type CWT-1, CWT-2: ANSI A137.1, and as follows:
   1. Tongue in Chic manufactured by Alyse Edwards .
   2. Size and Shape: as follows.
      a. CWT 4: 2.5 x 10.5 inches
   3. Edges: Square.
   4. Color(s):
      a. CWT-1: Kickin' Ash & Takin' Names, Product AECTONAS210.
      b. CWT-2: Kickin' Ash & Takin' Names, Accent Tile: Product AECTONAS210.

2.02 TRIM AND ACCESSORIES

A. Trim: Quarry tile, style and dimensions to match field tile, for setting using tile mortar or adhesive.
   1. Applications:
      a. Open edges of wall tile: Bullnose
      b. Wall corners, inside: Jointed.
      c. Floor to wall joints: Cove base.
   2. Manufacturer: Same as field tile.

B. Metal Trim: Stainless Steel
   1. Manufacturer:
      a. Schluter-Systems: www.schluter.com.
         1) Cove: DILEX-EHK
         2) Corner: RONDEC
         3) Bullnose: RONDEC-DB
      b. Genesis APS International: www.genesis-aps.com.
         1) Cove: Internal Trim EWA
         2) Corner and Bullnose: Stainless Steel Quadrant Trim ESQ

C. Thresholds: Marble, white, honed finish; 4 inches wide by full width of wall or frame opening; thickness to fit application; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.

2.03 SETTING MATERIALS

A. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4 or ANSI A118.15.
   1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.
   2. Products:
      a. Custom Building Products; MegaLite: www.custombuildingproducts.com.
      b. LATICRETE International, Inc; LATICRETE 254 Platinum: www.laticrete.com.
      c. Merkrete, by Parex USA, Inc; Merkrete 735 Premium Flex: www.merkrete.com/sle.
      d. ProSpec, an Oldcastle brand; Permalastic System: www.prospec.com.
      e. MAPEI, "Ultraflex RS" Bond Coat.
      f. Substitutions: See Section 01 6000 - Product Requirements.

2.04 GROUTS

A. Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
   1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
   2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
   3. Color(s): As selected by Architect from manufacturer's full line.

B. Grout Sealant: Manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.
   1. Products:
      a. Bonsal, W. R., Company; Grout Sealer.
      b. Bostik; CeramaSeal Grout Sealer.
      c. C-Cure; Penetrating Sealer 978.
      d. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.
      e. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
      f. TEC Specialty Products Inc.; TA-256 Penetrating Silicone Grout Sealer.”

2.05 THICK-BED MATERIALS

A. Mortar Bed Materials: Portland cement, sand, latex additive, and water.
   1. Products:
      a. LATICRETE International, Inc; LATICRETE 3701 Fortified Mortar Bed: www.laticrete.com.
      b. Merkrete, by Parex USA, Inc.; Merkrete Underlay C: www.merkrete.com.
      c. MAPEI, "Ultraflex LFT."

B. Waterproofing Membrane Under Mortar Bed :
   1. Material: Chlorinated polyethylene sheet, 40 mils thick, minimum; complying with ASTM D4068.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Install thresholds where indicated.

H. Sound tile after setting. Replace hollow sounding units.

I. Keep control and expansion joints free of mortar, grout, and adhesive.

J. Keep expansion joints free of adhesive or grout. Apply sealant to joints.

K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

L. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

N. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F125-Full, with Latex/Polymer Modified Portland Cement Mortar and Polymer Modified Tile grout, unless otherwise indicated.
   1. Use uncoupling membrane under all tile unless other underlayment is indicated.
   2. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.
      a. Locations: Toilet rooms with floor drains

3.05 INSTALLATION - SHOWERS AND BATHTUB WALLS

A. At tiled walls install in accordance with The Tile Council of North America Handbook Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
   1. Locations: Full height of tile in toilet rooms with floor drains.

B. Grout with latex-Portland cement grout.

C. Seal joints between tile work and other work with sealant Type 6 specified in Section 07 9005.

3.06 INSTALLATION - WALL TILE

A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

B. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.07 GROUTING

A. Follow grout manufacturer's recommendations as to grouting procedures and precautions.

B. Remove all grout haze, observing both tile and grout manufacturer's recommendations as to use of acid and chemical cleaners.

C. Rinse tile work thoroughly with clean water before and after chemical cleaners.

D. Polish surface of tile work with soft cloth.

3.08 PROTECTION, CLEANING AND GROUT SEALING

A. Do not permit traffic over finished floor surface for 4 days after installation.

B. Apply to clean, completed tile walls and floors a protective coat of neutral cleaner solution, 1 part cleaner to 1 part water.

C. Cover tile floors with heavy-duty, non-staining construction paper, masked in place.

D. Prior to final acceptance of tile work, remove paper and rinse protective coat of neutral cleaner from all the surfaces.

E. Clean tile and grout surfaces.

F. Apply grout sealant according to manufacturer's directions.

END OF SECTION

SECTION 09 5100
SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

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; 2014.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

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 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on suspension system components and acoustical units.

C. Samples: Submit two samples 6 by 6 inch in size illustrating material and finish of acoustical units.

D. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner, and perimeter molding.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 6000 - Product Requirements, for additional provisions.
2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.05 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 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 6000 - Product Requirements.

B. Acoustical Units - General: ASTM E1264, Class A.

C. Acoustical Tile Type 1: Painted faced mineral fiber, ASTM E1264 Type IV, Form 2, Pattern E, Fire Class A with the following characteristics:
   1. Size: 24 by 24 inches.
   2. Thickness: 7/8 inches.
   3. Composition: Water felted.
   4. Light Reflectance: 86 percent, determined in accordance with ASTM E1264.
   5. NRC Range:.85 to.85, determined in accordance with ASTM E1264.
   6. Articulation Class (AC): 170, determined in accordance with ASTM E1264.
   7. Ceiling Attenuation Class (CAC): 32, determined in accordance with ASTM E1264.
   8. Edge: Beveled tegular.
   9. Surface Color: White.
   10. Surface Pattern: Smooth.
   11. Suspension System: Exposed grid Type 1.
   12. Products:
      a. Calla,Item No. 2824, manufactured by Armstrong World Industries.

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 6000 - Product Requirements.

B. Suspension Systems - General: Complying with ASTM C635/C635M; 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; 9/16 inch wide face.
   2. Construction: Double web.
   3. Finish: White painted.
   4. Product: Suprafine XL, Item No. 7500 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 7873 shadow molding, nominal 9/16" x 15/16" x 3/8" reveal 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.

G. Install hold-down clips on panels within 20 ft of an exterior door.

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 6229
CORK FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Natural cork tile flooring.

B. Field-applied floor finish.

C. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 2000 - Finish Carpentry: Wood wall base.

B. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

A. ASTM F386 - Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces; 2011.

B. ASTM F2055 - Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method; 2010.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Verification Samples: Submit two samples, 2 inches square, illustrating material, color and pattern.

E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for refinishing.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 100 sq ft of each type, color, and pattern installed.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cork Floor Tiles:
   1. Globus Cork, 741 E. 136th St., Bronx, NY 10454; Tel: 718-742-7264 ; Fax: 718-742-7265 ; www.corkfloor.com .
   2. WE Cork Inc.,16 Kingston Road, Unit #6, Exeter, NH 03833; www.wecork.com.
   3. Jelinek Cork Group - cork@jelinek.com.
   4. Capri Cork, LLC, 800.492.2613 fax 717.627.5007; www.capricork.com

2.02 COMPONENTS

A. Cork Floor Tiles: Cork granules bonded into sheets; cork throughout full thickness, free of hardback cork and foreign material; smooth top and bottom surfaces; bottom surface suitable for adhesive bonding; free of cracks, broken corners and edges, indentations, and anomalous color variations.
   1. Wear Layer: Manufacturer's standard homogeneous composition through entire thickness.
   2. Colors: To be selected by Architect from manufacturer's standard range.
   3. Face Dimensions: Either 12 by 12 inches or 300 by 300 mm.
   4. Thickness: 3/16 inch, minimum.
   5. Dimensional Tolerances:
      a. Squareness: Not more than 0.005 inch out of square when tested in accordance with ASTM F2055.
      b. Thickness: Maximum of plus / minus 0.005 inch deviation from specified thickness except for beveled edges, when tested in accordance with ASTM F386.
      c. Length and Width: Maximum of plus or minus 0.016 inch deviation from specified dimensions, when tested in accordance with ASTM F2055.
   6. Edges: Square.

B. Edge and Transition Strips and Moldings: Solid rubber of color compatible with flooring.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Adhesive and Primer: Waterproof; types recommended by flooring manufacturer.

C. Varnish for Field Finish: Water-based (no VOC) polyurethane, specifically formulated to be flexible over cork flooring; 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 substrate surfaces are dust-free and free of substances that could impair bonding of adhesives.

C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and acidity (pH).
   1. Test in accordance with Section 09 0561.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

C. Prohibit traffic until filler is cured.

D. Clean substrate.

E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 FLOORING INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's instructions.

C. Mix tile from at least two containers to randomize shade variations when tile is placed.

D. Spread only enough adhesive to permit installation of materials before initial set.

E. Set flooring in place, with tight joints; press with heavy roller to attain full adhesion.

F. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

G. Install tile in checkerboard pattern. Do not use less than 1/2 full size tile width at perimeter.

H. In doorways where adjacent floor finish is different, terminate flooring under centerline of door; provide divider strip.

I. At open or exposed edges, where flooring terminates, and where indicated, provide tapered edge strip.
   1. Install resilient edge strips after installing flooring; secure with adhesive.

J. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

K. Apply field finish in accordance with finish and flooring manufacturers' instructions and recommendations.

3.04 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean flooring using methods recommended by manufacturer.

3.05 PROTECTION

A. Prohibit traffic on flooring for 48 hours after installation.

END OF SECTION

SECTION 09 6429
WOOD STRIP FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood strip flooring, nailed.
   1. Athletic wood floor at gymnasium.
   2. Wood strip flooring at portion of auditorium stage.

B. Secondary subflooring.

C. Sleepers on cushion blocks.

D. Sheet vapor retarder.

E. Surface finishing and game markings.

1.02 REFERENCE STANDARDS

A. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; Maple Flooring Manufacturers Association; current edition.

B. NOFMA (IN) - Installing Hardwood Flooring; National Oak Flooring Manufacturers Association; current edition located at www.nofma.org.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate floor joint pattern and termination details.
   1. Indicate provisions for expansion and contraction.
   2. Indicate location, size, design, and color of game markings.

C. Installation Instructions: Indicate standard and special installation procedures.

D. Maintenance Data: Include maintenance procedures.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.04 QUALITY ASSURANCE

A. Perform work of this section in accordance with MFMA (SPEC).

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing work of this section with minimum five years experience.

1.05 FIELD CONDITIONS

A. Do not install wood flooring until wet construction work is complete and ambient air at installation space has moisture content stabilized at maximum moisture content of 40 percent.

B. Provide heat, light, and ventilation prior to installation.

C. Store materials in area of installation for minimum period of 24 hours prior to installation.

D. Maintain minimum room temperature of 65 degrees F for a period of two days prior to delivery of materials to installation space, during installation, and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gymnasium Flooring:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide RezillChannel manufactured by Connor Sports Flooring, or comparable product by one of the following:
      a. UltraChannel DC by Aacer Flooring, LLC.
      b. CRP, Controlled Response Performance System by Horner Flooring Company, Inc.
   2. Strip Flooring
      a. Northern hard maple, 2-1/4” (57mm) width x 25/32” (20mm) thick, 2nd & Better, T&G and end matched, kiln dried.
      b. Preservative treatment: Clear, penetrating, water-repellant wood preservative that protects against mold, mildew, stainingand decay fungi; complying with MFMA's written recommendations and applied by imersion.
   3. Subfloor: 1” X 6” (nominal) Spruce, Pine, Fir, Hemlock, S4S, random length. Supplied by manufacturer.
      a. FSC® Certified: Subfloor must be certified by the Forest Stewardship Council™
   4. Plywood underlayment: 2 layers of 15/32 inch thick plywood; Exposure 1 , sanded , preservative treated.
   5. Channels: Manufacturer's standard for product designation above.
   6. Channel Anchors: Manufacturer's standard, min. 900 lb. pull-out.
   7. Clips: Manufacturer's standard for product designation above.
   8. Resilient pads: 7/16 inch by 2 inch by 2 inch.
   9. Perimeter Base - 3” x 4” (76mm x 99mm) ventilating type.
   10. Finishing Materials
      a. Oil modified polyurethane sealer and finish.
      b. Gameline paint shall be recommended by the finishing materials manufacturer and be compatible with the finish.
   11. Substitutions: Section 01 6000 - Product Requirements.

B. Flooring Nails: Type recommended by flooring manufacturer.

C. Sleepers and Shims: Softwood lumber, pressure treated for moisture protection, 2 x 4 inch size.

D. Secondary Subflooring: 15/32 inch thick plywood, with tongue and groove edges; Exposure 1, sanded, preservative treated.

E. Vapor Retarder: Black polyethylene sheet, 6 mil thick; 2 inch wide tape for joint sealing.

2.02 ACCESSORIES

A. Ventilating Base: Molded rubber, 4 inch high with a 3 inch toe, ventilating type, with adhesives and accessories, black.

B. Cushion Blocks: Resilient pads, rubber material, sealed air channels for resiliency; compressible to 1/16 inch under a 40 psi load with full and immediate recovery.

C. Floor Finish: Polyurethane, to achieve high gloss surface; type recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 PREPARATION

A. Sleepers and Shims:
   1. Place sleepers over subfloor; space sleepers as per manufacturer's instructions.
   2. Shim underside of sleepers to achieve level line of plus or minus 1/4 inch in 10 feet.

B. Cushioned Sleepers:
   1. Secure cushion blocks to underside of sleepers at 16 inches oc and at each end. Shim between blocks and sleepers for equal bearing on floor surface and to achieve level line of plus or minus 1/4 inch in 10 feet.
   2. Place sleepers over subfloor; space sleepers as per manufacturer's instructions perpendicular to room length; do not secure to subfloor.

C. Secondary Subflooring: Place two layers of plywood subflooring over sleepers.
   1. Lay the first layer perpendicular to the sleepers, with end joints over sleepers, and nail at 12 inches on center.

D. Prepare substrate to receive wood flooring in accordance with manufacturer's, MFMA, and NOFMA instructions.

E. Broom clean substrate.

3.02 INSTALLATION

A. Sheathing Paper: Place over wood subfloor; lap edges and ends 2 inches, staple in place.

B. Wood Flooring:
   1. Install in accordance with manufacturer's, MFMA, and NOFMA instructions; predrill and blind nail to sleepers.
   2. Lay flooring parallel to length of room areas. Verify alignment as work progresses.
   3. Arrange flooring with end matched grain set flush and tight.
   4. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar; provide divider strips and transition strips in accordance with flooring manufacturer's recommendations and as indicated..
   5. Install edge strips at unprotected or exposed edges, and where flooring terminates.
   6. Secure edge strips before installation of flooring with stainless steel screws.
   7. Install flooring tight to floor access covers.
   8. Provide 3/4 inch expansion space at fixed walls and other interruptions.

C. Finishing:
   1. Mask off adjacent surfaces before beginning sanding.
   2. Sand flooring to smooth even finish with no evidence of sander marks. Take precautions to contain dust. Remove dust by vacuum.
   3. Apply finish in accordance with floor finish manufacturer's instructions.
   4. Apply filler and three finish coats.
   5. Apply first coat, allow to dry, then buff lightly with steel wool to remove irregularities. Vacuum clean and wipe with damp cloth before applying succeeding coat.
   6. Lightly buff between coats with steel wool and vacuum clean before applying succeeding coat.
   7. Apply colored game lines 2 inches wide and logo to layout indicated on drawings.
   8. Apply last coat of finish.

3.03 CLEANING

A. Clean and polish floor surfaces in accordance with manufacturer's instructions.

3.04 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Place protective coverings over finished floors; do not remove coverings until Substantial Completion.

END OF SECTION

SECTION 09 6500
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Resilient stair accessories.

D. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, cleaning, and preparation.

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 E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.

B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

C. ASTM F1859 - Standard Specification for Rubber Sheet Floor Covering Without Backing; 2014.

D. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).

E. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; 2002.

F. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product specified.

E. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 100 square feet of each type and color.

3. Extra Wall Base: 100 linear feet of each type and color.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect roll materials from damage by storing on end.

1.07 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 SHEET FLOORING

A. Rubber Sheet Flooring: 100 percent rubber composition, color and pattern through total thickness.
   1. Manufacturers:
      a. Nora; Noraplan environcare.
   2. Minimum Requirements: Comply with ASTM F1859, Type 1, without backing.
   3. Total Thickness:.12 inch (3.0 mm) minimum.
   4. Sheet Width: 48 inch (1.22m) minimum.
   5. Design: Flat.
   6. Pattern: Flecked.

2.02 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Manufacturers:
      a. Roppe Corp: www.roppe.com.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648.
   3. Height: 4 inch.
   4. Thickness: 0.125 inch thick.
   5. Finish: Satin.
   6. Color: Color as selected from manufacturer's standards.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
   1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.

C. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Test in accordance with Section 09 0561.
   2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 0561.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints and butt seams tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 SHEET FLOORING

A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns carefully at seams.

B. Double cut sheet at seams.

3.05 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.07 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 6623
EPOXY-RESIN TERRAZZO FLOORING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes.
   1. Thin-set epoxy terrazzo.
   2. Precast, thin-set, epoxy terrazzo wall base units.
   3. Related accessories.

1.02 RELATED REQUIREMENTS:

A. Section 03 30 00, Cast In Place Concrete.

B. Section 05 51 00, Metal Stairs.

C. Section 07 26 16, Under-slab Vapor Retarder/Barrier.

D. Section 07 90 00, Joint Protection.

1.03 REFERENCES

A. American Concrete Institute (ACI):
   1. ACI Committee No. 403 Bulletin Title No. 59-43.

B. American Society for Testing and Materials (ASTM):
   1. ASTM C131 "Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine."
   2. ASTM C1021 Standard Practice for Laboratories Engaged in the Testing of Building Sealants."
   3. ASTM C1093 Standard Practice for Accreditation of Testing Agencies for Masonry."
   4. ASTM D412 "Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension."
   5. ASTM D696 "Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer."
   6. ASTM D1308 "Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes."
   7. ASTM D2240 "Standard Test Method for Rubber Property-Durometer Hardness."
   8. ASTM D2370 "Standard Test Method for Tensile Properties of Organic Coatings."
   9. ASTM E96 "Standard Test Methods for Water Vapor Transmission of Materials."
   10. ASTM F1869 "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride."
   11. ASTM F2170 "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.".

C. The International Accreditation Service (IAS)
   1. IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC Standard 17025.

D. International Concrete Repair Institute (ICRI):
   1. "Technical Guidelines 03732: Guide for Selecting and Specifying Surface Preparation for Sealers, Coatings, and Membranes."

E. The International Laboratory Accreditation Cooperation (ILAC).
   1. IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC Standard 17025.

F. International Masonry Institute (IMI).

G. International Organization for Standardization (ISO):
   1. ISO 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

H. The National Terrazzo & Mosaic Association Inc. (NTMA):
   1. “Terrazzo Specifications and Design Guide”
   2. “Guide Specification for Epoxy Terrazzo”.
   3. Technical Bulletin #111.

1.04 COORDINATION

A. Coordinate the types of traffic allowed on terrazzo between the following events:
   1. Completion of pouring and before coarse grinding.
   2. Completion of grouting and before polishing.

B. Coordinate the preparation for terrazzo work with the installation of plumbing, electrical, communications, and data work in the floor area to receive terrazzo.
   1. Verify that fixtures, equipment, and outlets will be located properly and at the correct elevation.

1.05 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Prior to installation of concrete substrates, conduct conference at Project site to comply with requirements in Section 01 31 00 Project Management and Coordination. Review methods and procedures related to terrazzo including, but not limited to, the following:
   1. Inspect and discuss installation procedures, joint details, jobsite conditions, substrate specification, vapor barrier details and coordination with other trades.
   2. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment and facilities needed to make progress and avoid delays.
   3. Review special terrazzo designs and patterns.
   4. Review dust control procedures.
   5. Review plans for concrete curing and site drying to enable timely achievement of suitable slab moisture conditions.
   6. Review concrete substrate tolerance requirements for acceptable terrazzo installation.

1.06 SUBMITTALS

A. Product Data: Manufacturer’s product data for each type of terrazzo and accessory including the following information:
   1. Physical properties.
   2. Performance properties.
   3. Independent Lab Testing for Moisture Mitigation System and Bond Strength Testing
   4. For tests not listed in published data, supply missing data according to standard referenced.

B. Shop Drawings: Include terrazzo installation requirements. Include plans, elevations, sections, component details and attachments to other work. Show layout of the following:
   1. Divider strips.
   2. Control- and expansion-joint strips.
   3. Base and border strips.
   4. Precast terrazzo-jointing and edge configurations including anchorage details.
   5. Terrazzo patterns.

6. Layout of special graphic patterns.
7. Large scale details of terrazzo patterns and metal or other material inserts.

C. Samples for Initial Selection: Provide Manufacturer's color plates showing the full range of colors and patterns available for each terrazzo type indicated.

D. Samples for Verification: For each type, material, color and pattern of terrazzo and accessory required showing the full range of color, texture and pattern variations expected. Label each terrazzo sample to identify manufacturer's matrix color and aggregate types, sizes and proportions. Prepare samples of same thickness and from same material to be used for the Work in size indicated below:
   1. Epoxy Terrazzo: minimum 6" x 6" (150 mm x 150 mm) sample of each color and type of terrazzo.
   2. Precast Epoxy Terrazzo: minimum 6" x 6" (150 mm x 150 mm) sample of each color and type of terrazzo.
   3. Accessories: 6" (150 mm) length of each kind of divider strip, stop strip and control joint strip required.

E. Qualification Data: For Installer and Manufacturer.

F. Material Test Reports: For moisture and/or relative humidity of substrate, by a qualified testing agency.

G. Preconstruction Examination Reports: For list conditions of in place substrate which will detrimental to performance of terrazzo flooring installation.

H. Sample Warranties: For manufacturer's special warranties.

1.07 CLOSEOUT SUBMITTALS

A. Maintenance Data: NTMA maintenance recommendations and manufacturer's instructions to include in maintenance manuals.

B. Repair Procedures: Provide written procedures for the following:
   1. Epoxy Terrazzo Flooring: Removal and replacing damaged portions of flooring.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: Engage a terrazzo manufacturer with minimum 5 years documented manufacturing experience producing epoxy binder, and flexible crack isolation membranes; including the following:
   1. Proof of NTMA membership.
   2. Furnish documentation for at least 5 epoxy terrazzo projects of the same scope and complexity; installed in the past 5 years using material being submitted for this project.
   3. For each epoxy terrazzo project submitted, provide the following information:
      a. Project name.
      b. Square footage of terrazzo installed.
      c. Lineal footage of precast base and cast in place base.
      d. Address of facility with contact name and phone number.
      e. Contact name, address and phone number of prime contractor or construction manager.
      f. Field experience resumes of key project personnel including lead supervisor and field technicians to be used on this project.

B. Installer Qualifications: Submit proof of Contractor's membership in NTMA or IMI with a letter recognizing that they are a qualified installer in good standing and is acceptable to epoxy terrazzo manufacturer.

1. Furnish documentation for at least 3 epoxy terrazzo projects of the same scope and complexity; installed in the past 5 years using material being submitted for this project.
2. For each epoxy terrazzo project submitted, provide the following information:
   a. Project name.
   b. Square footage of terrazzo installed.
   c. Lineal footage of precast base and cast-in-place base.
   d. Address of facility with contact name and phone number.
   e. Contact name, address and phone number of prime contractor or construction manager.
   f. Field experience resumes of key project personnel including lead supervisor and field technicians to be used on this project.
3. For each epoxy terrazzo project submitted, provide the following information:

C. Testing Agency Qualifications: Qualified according to ASTM C1021 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC Standard 17025.

D. Mockups: Build mockups to verify selections made under sample submittals; to demonstrate aesthetic effects; and to set quality standards for materials and execution.
1. Build mockup of typical terrazzo flooring installation as shown on Drawings.
   a. Size: Minimum 100 sq. ft. (9 sq. m.) of typical poured-in-place flooring and base condition for each color and pattern in locations directed by Architect.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's undamaged, unopened containers with a label on each container clearly marked with the following information:
1. Product name
2. Manufacturer's name
3. Component designation (A or B, etc.)
4. Ratio of component mixture
5. CHEMTREC Emergency Response Information

B. Handle materials by methods which prevent damage.

C. Inspect direct jobsite deliveries to assure quantities are correct; materials comply with requirements; and materials are not damaged.

D. Immediately return materials found to be defective in manufacturing and materials damaged in transit, handling or storage.
1. Replace defective materials at no cost to Owner.

E. Store materials per manufacturer's instructions and as follows:
1. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity.
2. Maintain storage temperatures between 60° F (15.6° C) and 90° F (32.2° C).
3. Maintain seals and labels intact and legible.

4. Do not use materials which have been stored for a longer period of time than the manufacturer's maximum recommended shelf life.

1.10 FIELD CONDITIONS

A. Temperature:
   1. Maintain the ambient room and substrate temperature at 55° F (12.8° C) or above during stripping and pouring.
      a. Maintain this temperature at least 48 hours after completion of pouring.
   2. After terrazzo has been poured, maintain substrate temperature at 40° F (4.4° C) or above until substantial completion.
   3. Each day of installation, before beginning work, verify that the dew point is at least 5° F (-15.0° C) less than the slab and air temperature.

B. Verify that adequate ventilation is provided.

C. Maintain a minimum uniform level of 50-60 foot candles (538.2 Lux - 645.8 Lux) in areas where terrazzo system is being installed.

D. Field Measurements, Precast Terrazzo: Verify actual dimensions of construction contiguous with precast terrazzo by field measurements before fabrication.

E. Acceptable Substrate Conditions:
   1. Flatness Tolerance: Maximum variation from flatness of 1/4 inch in 10 feet (6 mm in 3 m).
   2. Concrete floor Finish: Steel trowel finish.
   3. Allow concrete to receive epoxy terrazzo to cure for at least 30 days before beginning installation process.
      a. Allow no curing agents to be used in areas to receive terrazzo.
   4. Test concrete substrate to determine acceptable moisture levels prior to terrazzo installation.
   5. Saw cutting of control joints must be done between 12 and 24 hours after placement of the structural concrete and at a frequency compatible to ACI recommendations.

F. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

G. Close spaces to traffic during terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.

H. Provide protection from other trades prior to final acceptance by owner.

I. Dust Control: Control and collect dust produced by grinding operations. Comply with requirements of Section 01 50 00 Temporary Facilities and Controls.

1.11 WARRANTY

A. Special Warranty: Manufacturer and installer, jointly, agree to provide labor and material to repair (and if necessary to replace) components of epoxy terrazzo flooring system that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, loss of bond and damage due to normal wear and tear.
   2. Failures do not include the following:
      a. Damage due to bubbling or loss of adhesion due to moisture penetration through the substrate.
      b. Acts of God or other elements beyond scope of protection of this system.
      c. Reflective cracks from substrate.

3. Warranty Period: One year(s) from date of Substantial Completion.
4. Limitations:
   a. In case of warranty claim, Owner will provide written notice to terrazzo manufacturer and installer within 30 days of problem's discovery.
   b. Owner will provide free access to area during normal working hours.
   c. Owner assumes responsibility for protection and maintenance of epoxy terrazzo flooring from date of Substantial Completion on.
   d. Remedies provided by epoxy terrazzo flooring manufacturer and installer are limited to direct repair of Epoxy Terrazzo Flooring System.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Products: Subject to compliance with requirements, provide products by Master Terrazzo Technologies, Levittown, PA (www.masterterrazzo.com) indicated in Part 2 Articles below or comparable products by one of the following:
   1. Crossfield Dex-O-Tex.
   2. General Polymers (a subsidiary of Sherwin Williams).

B. Source Limitations: Obtain primary Epoxy Terrazzo Flooring System materials including membranes, primers, resins, and hardening agents from a single manufacturer.
   1. Obtain aggregates, solvents, divider strips, sealers and cleaners from source recommended by primary materials manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. NTMA Standards: Comply with NTMA's "Terrazzo Specifications and Design Guide" and with written recommendations for terrazzo type indicated unless more stringent requirements are specified.

2.03 EPOXY TERRAZZO FLOORING SYSTEM

A. Materials:
   1. Epoxy Resin: Manufacturer’s standard recommended for use indicated and in color required for mix indicated.
      a. Physical Properties without Aggregates:
         1) Hardness: ASTM D2240 70-85 Shore D
         2) Minimum Tensile Strength: 4,800 psi (33 mPA) per ASTM D638 for a 2-inch (50 mm) specimen made using a “C” die per ASTM D412.
         3) Minimum Compressive Strength: 12,000 psi (83 mPA) per ASTM D695, Specimen B cylinder.
         4) Chemical Resistance: No deleterious effects by contaminants listed below after 7-day immersion at room temperature per ASTM D1308.
            (a) Distilled water
            (b) Mineral water
            (c) Isopropanol
            (d) Ethanol
            (e) 0.025 percent detergent solution
            (f) 1 percent soap solution
            (g) 10 percent sodium hydroxide
            (h) 10 percent hydrochloric acid
            (i) 5 percent acetic acid

b. Physical Properties with Aggregates: For resin blended with Georgia White marble, ground, grouted, and cured per requirements in NTMA's "Guide Specification for Epoxy Terrazzo," comply with the following:
   1) Flammability: Self-extinguishing, maximum extent of burning 0.25 inch (6 mm) per ASTM D635.
   2) Linear Coefficient of Thermal Expansion: 25.0x10-6 in/in per ºF (11.4x10-7 cm/cm per ºC) for temperature range of -12° to 140° F (-24° to 60° C) per ASTM D696.
   3) Bond Strength: When tested in accordance with Field Test Method for surface soundness and adhesion as described in ACI Committee No. 403 Bulletin Title No. 59-43 the Epoxy terrazzo shall comply with the following value: 100 percent concrete failure minimum, with 300 psi (2.1 mPA) minimum tensile strength.

2. Aggregate Chips: Marble, Granite, Glass, Synthetic, and Mother of Pearl:
   a. Sizes: #2's, #1's and #0's, conforming to NTMA gradation standards.
   b. Abrasion and Impact Resistance: ASTM C131-89; maximum 40 percent loss.
   c. Chips shall contain no deleterious or foreign matter.

B. Mix: Comply with NTMA's "Terrazzo Specifications and Design Guide" and manufacturer's written instructions for matrix and aggregate proportions and mixing.
   1. Color and Pattern Schedule: Where the following designations are indicated, provide specified terrazzo matrices matching architect's samples:

2.04 PRECAST TERRAZZO UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Precast Terrazzo Enterprises, Raleigh, NC 800-849-8849
   2. Romoco Precast Terrazzo Products, Manheim, PA 717-665-2739
   3. Wausau Tile, Wausau, WI 800-388-8728
   4. Substitutions: As requirements of Section 01 6000 - Product Requirements allow.

B. Precast Wall Base Units : Precast epoxy terrazzo cove base units, 3/8 inch (9.5 mm) thick, unless otherwise indicated with 3/4 inch (19 mm) radius cove; cast in maximum lengths possible, but not more than 48 inches (1200 mm).
   1. Configuration: As indicated on Drawings.
   2. Height: As indicated on Drawings.
   3. Outside Corner Units: With finished returned edges at outside corner.
   4. Colors and Patterns: Match Architect's samples.

C. Toe Strips for Precast Wall Base: L-type or T-type strips to fit cove base units in depth required for topping thickness indicated.
   1. Material: To match divider strips.
   2. Top Width: To match divider strips.

2.05 DIVIDER AND ACCESSORY STRIPS

A. Thin -Set Divider Strips: L-type and T-type.
   1. Material: White zinc alloy, .
   2. Top Width: 1/16 inch (1.6 mm) and 1/8 inch (3 mm).

B. Heavy-Top Divider Strips: Angle type in depth required for topping thickness indicated.
   1. Bottom-Section Material: Matching top-section material.
   2. Top-Section Material: White zinc alloy, unless otherwise indicated.

3. Top-Section Width: 1/8 inch (3 mm), unless otherwise indicated.

C. Control joint Strips: Separate, double L-type divider strips, positioned back to back with 3/8 inch (9.5 mm) separation filled will sealant.

D. Accessory Strips: Match divider-strip width, material, and color unless otherwise indicated. Provide the following types of accessory strips:
   1. Base bead and base dividers.

2.06 MISELLANEOUS PRODUCTS

A. Concrete Patch and Topping: 100 percent solids fill mortar system including blended aggregate.
   1. Basis of Design Product: MorriFill™ Epoxy Slope and Fill Mortar.
   2. Compressive Strength: ASTM C579, 8,000 psi (55 mPA) minimum.
   3. Hardness: ASTM D2240, 75-80 Shore D

B. Moisture Remediation System: Two-component formulation designed to reduce moisture vapor transmission through concrete and provide bond with epoxy terrazzo flooring system.
   1. Basis of Design: Morricite MVP™ Moisture Suppression System by Master Terrazzo Technologies.
   2. Adhesion: ASTM D4541, 500 psi (3.5 mPA).
   3. Moisture Vapor Transmission: ASTM E96, 0.131 perm.

C. Primer: 100 percent solids, epoxy primer moisture insensitive. No solvent containing primers are allowed
   1. Basis of Design Product: Morricite® Primer.
   2. Moisture Vapor Transmission: ASTM E96, 1 perm maximum.

D. Crack Isolation Membrane
   1. Basis of Design Product: MasterFlex™ Flexible Epoxy Membrane.
   2. Flexible Epoxy Membrane: Flexible epoxy membrane with 100 percent solids with the following properties:
      a. Tensile Strength: ASTM D2370 at 68° F (20° C) 1,500 psi (10 mPA).
      b. Elongation: ASTM D2370 at 68° F (20° C) 130 percent.
      c. Adhesion: ASTM D4541, 350 psi (2.4 mPA)

E. Membrane Reinforcing: Fiberglass mesh reinforcement fabric compatible with crack isolation membrane.
   1. Basis of Design Product: MasterFlex™ Fabric.

F. Divider-Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use and acceptable to terrazzo manufacturer.
   1. Use adhesive that has a VOC content of 50g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

G. Anchoring Devices:
   1. Strips: Provide mechanical anchoring devices for strip materials as required for secure attachment to substrate.
   2. Precast Terrazzo: Provide mechanical anchoring devices as recommended by Terrazzo Contractor for proper anchorage and support of units for conditions of installation and support.

H. Finishing Grout: Epoxy grout with 100 percent Solids.
   1. Basis of Design Product: Morricite® Terrazzo Grout.

I. Control Joint Filler: Flexible, grindable, epoxy joint filler, 100 percent solids, with the following properties:
   1. Basis of Design Product: MTT ColorFlex™.
   2. Tensile Strength: ASTM D2370 at 68° F (20° C) 1,600 psi (11 mPA)
   3. Elongation: ASTM D2370 at 68° F (20° C) 100 percent
   4. Tensile Modulus: ASTM D2370 at 68° F (20° C) 27,800 psi (192 mPA)
   5. Color: As selected by the Architect.

J. Joint Sealant: MTT ColorFlex™ flexible sealant.

K. Expansion Joints: Comply with requirements of Section 07 9000 "Joint Sealants".

L. Abrasive Strips: Metal channels matching strips to receive epoxy and abrasive aggregate.
   1. Barrier free profile, extruded aluminum base and anchor for casting into concrete fill, aluminum oxide blend abrasive filled, ribbed style with anti-slip surface, color as selected; 3 inches wide by 1/8 inch less the tread width long.
   2. Two piece aluminum; with anchor assembly for casting into concrete and screw attached abrasive insert forming finish nosing surface.

M. Terrazzo Cleaner: As recommended by cleaner manufacturer for use on terrazzo type specified and as follows:
   1. Biodegradable
   2. Chemically neutral
   3. pH factor between 7 and 10
   4. Free from phosphate, crystallizing salts, and water soluble alkaline salts.

N. Terrazzo Sealers: Slip- and stain-resistant sealer that is chemically neutral with a pH factor between 7 and 10, a standard coefficient of friction of 0.6 or higher, does not affect physical properties of terrazzo and complies with NTMA's "Terrazzo Specifications and Design Guide."
   1. General: Provide sealers approved by terrazzo flooring system manufacturer.
   2. Water Based Sealer: Provide a medium gloss water based sealer and finish system.
      a. Basis of Design Product: MTT SealOn Waterborne Sealer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas, with Terrazzo Contractor present, for compliance with requirements for installation tolerances and other conditions affecting performance.
   1. Evaluate slab condition, including slab moisture content and extent of repairs required to comply with substrate requirements of NTMA's "Terrazzo Specifications and Design Guide" and the requirements of this Section.
   2. Verify that concrete substrate was poured no fewer than 30 days prior to date of examinations.
   3. Verify existing work has no defects affect proper execution of terrazzo work.
   4. Verify that concrete substrate meets flatness tolerances.
   5. Verify that concrete substrates are visibly dry and free of moisture.

B. Prepare written preconstruction examination report, endorsed by Installer, listing conditions detrimental to performance.

C. Proceed with installation only after unsatisfactory conditions, including flatness tolerances, have been corrected.

D. Verify measurements and dimensions; coordinate the installation of insert and work of other trades.

3.02 PREINSTALLATION TESTING

A. Concrete Moisture Testing, General
   1. Conduct relative humidity test at each test site.
   2. Conduct one pH test at each test site.

B. Calcium Chloride Testing:
   1. Perform tests in accordance with ASTM F1869.

C. Relative Humidity Testing:
   1. Perform tests in accordance with ASTM F2170.
   2. Conduct relative humidity testing at the following depths:
      a. Basement Slabs and Slabs-On-Grade: Measure temperature and relative humidity at 40 percent of slab thickness measured from top surface.
      b. Elevated Slabs: Measure temperature and relative humidity at 20 percent of slab thickness measured from top surface.
   3. Drill test hole at each test site to accommodate test sleeve.
   4. Hole Diameter: In accordance with test equipment manufacturer's instructions.
   5. Drilling Fluids: Not permitted.
   6. Vacuum dust and debris from test hole.
   7. Insert sleeve, to the full depth of test hole. Cap or plug sleeve to prevent test hole contamination.
   8. Permit the test site to acclimate for minimum 72 hours before measuring relative humidity.
   9. Remove sleeve plug and insert probe to bottom of test hole. Allow test probe to reach temperature equilibration with concrete slab.
   10. Measure and record temperature and relative humidity at the test site.

D. Proceed with terrazzo installation only after substrates have a maximum relative humidity measurement reading less than 80 percent.
   1. If concrete substrate moisture exceeds 80% according to ASTM F2170, consult terrazzo manufacturer for additional drying or negative side moisture remediation methods.

3.03 PREPARATION

A. Clean substrates of substances, including oil, grease and curing compounds, that might impair terrazzo bond. Provide clean, dry and neutral substrate for terrazzo application.

B. Provide clean, dry, and neutral substrate for terrazzo application.
   1. Determine dryness characteristics by performing moisture tests recommended by terrazzo manufacturer.

C. Concrete Slabs:
   1. Provide sound concrete surface free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil and other contaminants incompatible with epoxy terrazzo.
      a. Prepare concrete mechanically by shot blasting or by grinding.
         1) Surface preparation results should achieve a CSP3-CSP4 profile according to International Concrete Repair Institute Guideline No. 03732.
      b. Remove contaminating and bond breaking substances including but not limited to the following:
         1) Dust.

2) Laitance.
3) Curing compounds.
4) Coatings.
5) Sealers.
6) Oil.
7) Grease.
8) Mastics.
9) Adhesives.

c. Chemically remove oil and grease not removed by vacuum blasting.
d. Mechanically remove spalled and deteriorated concrete with scabbling or chipping hammers.
e. Do not acid etch concrete.
f. Repair or level damaged concrete with concrete patch and topping.
g. Do not use latex fills and self-leveling underlayments.
h. Cracks and non-expansion joints greater than 1/16 inch (1.6 mm) wide after surface preparation shall be prepared until sound.
   1) Repair cracks and non-expansion joints according to NTMA Technical Bulletin #111.

D. Protect other work from dust generated by shot blasting and grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.
   1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

E. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.
   1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

F. Apply one coat of moisture remediation system over concrete surface prepared to receive epoxy-resin terrazzo flooring according to manufacturer's written instructions where indicated on drawings.

3.04 INSTALLATION, EPOXY TERRAZZO

A. General:
   1. NTMA Standards: Comply with NTMA's "Terrazzo Specifications and Design Guide" and with written recommendations for terrazzo type and accessory indicated unless more stringent requirements are specified within this section.
   2. Comply with written directions of product manufacturer.
   3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control joint strips.
   4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

B. Full Membrane Application
   1. Flexible Reinforcing Membrane:
      a. Prepare and prefill substrate cracks with concrete patch and topping material or with primer and allow to cure.
      b. Apply 25 mils of crack isolation membrane over prepared substrate to produce full substrate coverage in areas to receive terrazzo.

c. Apply second coat of crack isolation membrane, 15 mils thick and install reinforcing fabric.
d. Prepare membrane according to manufacturer's written instructions before applying primer.

2. Primer: Install primer if required by manufacturer over crack isolation membrane.

C. Crack Detailing Application
1. Crack Treatment : After surface preparation, fill less than 1/16 inch (1.6 mm) wide with crack isolation membrane. Apply detail coat of crack isolation membrane over cracks and embed 12 inches (300 mm) wide strips of membrane reinforcing fabric.
2. Crack Treatment : Fill cracks and joints which are greater than 1/16 inch (1.6 mm) width with crack isolation membrane or primer.
a. Apply minimum 30 mil detail coat of crack isolation membrane. Extend coverage at least 12 inches (300 mm) on each side of crack.
b. After crack isolation membrane has leveled, lay minimum 9 inches (230 mm) wide precut strips of membrane reinforcing fabric into uncured crack isolation membrane. Saturate reinforcing fabric with additional crack isolation membrane.
3. Primer: Apply epoxy primer evenly over entire prepared substrate, including cracks and non-expansion joints, at a rate of 200-250 square feet per gallon (5 - 6 sq. m per liter).
a. Thoroughly wet surface with primer.
b. Do not allow primer to pond.

D. Divider and Accessory Strips: Install in locations indicated in adhesive setting bed without voids below strips.
1. Anchoring Strips: Adhere the strips to the floor with primer or hot glue.

E. Control Joint Strips: Provide one of the following where indicated:
1. Back to Back Strips: Install L-type divider strips back to back over full membrane parallel to control and non-doweled construction joints leaving a space appropriate for anticipated movement - typically 1/4 to 3/8 inch (6 to 9.5 mm) according to NTMA Technical Bulletin #111, Detail #1.
a. Fill gap between control joints with joint sealant.
2. Single Strip: Fill saw cut joint with control joint filler. Place L-type divider strip on concrete adjacent to joint according to NTMA Technical Bulletin #111, Detail 2.

F. Placing Terrazzo:
1. Mix terrazzo binder with chips and fillers in ratios as approved by manufacturer.
2. Trowel-apply terrazzo mixture over epoxy primer to provide smooth seamless surface at a minimum of 3/8 inch (9.5 mm) thick.
a. Allow terrazzo mixture to cure per manufacturer's recommendations prior to grinding operations.

G. Rough Grinding: Grind with 24 grit or finer stones or with comparable diamond plates.

H. Intermediate Grinding: Follow initial grind with 80 grit or finer stones .

I. Grouting: Prior to final grinding, apply epoxy grout as follows:
1. Cleanse floor with clean water and rinse thoroughly.
2. Remove excess rinse water by wet vacuum and machine until completely dry.
3. Apply epoxy grout to fill voids.

J. Fine Grinding: Grind with 120 grit or finer stones until all grout is removed from surface.
1. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding.

2. Produce surface with a minimum of 70 percent aggregate exposure.

K. Remove terrazzo in areas where terrazzo fails to bond properly to substrate and install new terrazzo.
1. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo.

L. Construction Tolerances: Limit variation in terrazzo surface from level 1/4 inch in 10 feet (6 mm in 3 m).

3.05 INSTALLATION, PRECAST TERRAZZO

A. Set units using method recommended by NTMA and by epoxy terrazzo flooring manufacturer unless otherwise indicated.

B. Set units with alignment level and true to dimensions, varying 1/8 inch (3.2 mm) maximum in length, height, or width.

C. Seal joints between units with joint sealants.

3.06 ADJUSTING

A. Cut out and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.

3.07 CLEANING

A. Cleaning:
1. Wash surfaces with cleaner according to NTMA's Maintenance Guide and manufacturer's written instructions.
2. Remove grinding dust from installation and wash surfaces according to manufacturers recommended cleaning procedures.
3. Allow surfaces to thoroughly dry before sealing.

3.08 PROTECTION

A. Protect surrounding substrates and surfaces, as well as in-place equipment from damage during surface preparation and system application.

B. Maintain area where terrazzo work is being done be free of other trades during surface preparation, crack detailing, divider strip installation, terrazzo pouring, and for a period of 36 hours upon completion.

C. Sealing:
1. Seal surfaces according to NTMA's written recommendations.
2. Apply terrazzo sealer according to sealer manufacturer's written instructions.

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

END OF SECTION

SECTION 09 6800
CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet, direct-glued.

B. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, 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; 2014c.

B. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.

C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

D. Samples: Submit two samples 12 by 12 inch in size illustrating color and pattern for each carpet material specified.

E. Submit two, 12 inch long samples of edge strip for each color specified.

F. Manufacturer's Installation Instructions: Indicate special procedures.

G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 6000 - Product Requirements, for additional requirements.
2. Extra Carpet: 100 sq ft of each type, color, and pattern installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet with minimum three years documented experience.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

C. Ventilate installation area during installation and for 72 hours after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 CARPET

A. Carpet Type CPT-1:
   1. Product: Brain Power manufactured by Mohawk.
   2. Roll Width: 12 ft.
   3. Color: To be selected.
   4. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
   5. VOC Content: Comply with Section 01 6116.

2.03 ACCESSORIES

A. Sub-Floor Filler: Type recommended by carpet manufacturer.

B. Moldings and Edge Strips: Rubber, color as selected.

C. Adhesives - General: Compatible with materials being adhered; maximum VOC content as specified in Section 01 6116.

D. Seam Adhesive: Recommended by manufacturer.

E. Contact Adhesive: Compatible with carpet material; releasable type.

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 carpet.

B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with Section 09 0561.
   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 as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Clean substrate.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).

C. Verify carpet match before cutting to ensure minimal variation between dye lots.

D. Lay out carpet and locate seams in accordance with shop drawings.
   1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
   2. Do not locate seams perpendicular through door openings.

3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
4. Locate change of color or pattern between rooms under door centerline.
5. Provide monolithic color, pattern, and texture match within any one area.

E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET

A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.

B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.

F. Complete installation of edge strips, concealing exposed edges. Bind cut edges where not concealed by edge strips.

3.05 CLEANING

A. Remove excess adhesive from floor and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, and other coatings.

C. Surfaces to be finished are indicated in this section and on the Drawings.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 05 5000 - Metal Fabrications: Shop-primed items.

C. Section 05 5100 - 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.

1.04 SUBMITTALS

A. See Section 01 3000 - 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. Submit products and systems by substrate as listed in Part 2.

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 MAINTENANCE MATERIALS SUBMITTALS

A. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual.

B. Manual shall include:
   1. Area Summary with finish schedule,
   2. Area Detail designating where each product/color/finish was used,
   3. product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures,
   4. color samples of each color and finish used.

1.06 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.

1.07 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

B. Provide scheduled finishes in mock-up room.

C. Locate where directed.

D. Mock-up may remain as part of the Work.

1.08 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.

1.09 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.

1.10 EXTRA MATERIALS

A. See Section 01 6000 - 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 6000 - 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.
3. Provide tints and colorants that will not add VOCs to specified products.

B. Paints and Coatings:
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 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 pipes and downspout boots.
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 Pro Industrial DTM Acrylic, semi-gloss
      3) 3rd Coat: S-W Pro Industrial DTM Acrylic, semi-gloss
   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: Galvanized Metal, Not Chromate Passivated:
2. Applications include but are not limited to doors, frames, and 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 Pro Industrial DTM Acrylic, semi-gloss
      3) 3rd Coat: S-W Pro Industrial DTM Acrylic, semi-gloss
   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: 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

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 Pro Industrial PreCatalyzed WB Epoxy, semi-gloss
         3) 3rd Coat: S-W Pro Industrial PreCatalyzed WB Epoxy, semi-gloss
      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, Brick and Glazed Brick – PREVIOUSLY PAINTED
   2. Manufacturers and Products:
      a. Sherwin Williams:
         1) 1st Coat: S-W Extreme Bond Primer
         2) 2nd Coat: S-W Pro Industrial PreCatalyzed WB Epoxy, semi-gloss
         3) 3rd Coat: S-W Pro Industrial PreCatalyzed WB Epoxy, semi-gloss
      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 - EXCEPT Handrails:
   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 Pro Industrial DTM Acrylic, semi-gloss
      3) 3rd Coat: S-W Pro Industrial DTM Acrylic, semi-gloss
   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

D. SYSTEM I-4
1. Substrate: Hollow metal door frames:
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 ProIndustrial WB Alkyd Urethane Enamel,semi-gloss B53-1150
      3) 3rd Coat: S-W ProIndustrial WB Alkyd Urethane Enamel,semi-gloss B53-1150
   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: Metal door frames, Handrails, Railings, and Stair parts- PREVIOUSLY PAINTED
   a. Sherwin Williams:
      1) 1st Coat: S-W Extrem Bond Primer
      2) 2nd Coat: S-W ProIndustrial WB Alkyd Urethane Enamel,semi-gloss B53-1150
      3) 3rd Coat: S-W ProIndustrial WB Alkyd Urethane Enamel,semi-gloss B53-1150
   b. Benjamin Moore:
      1) 1st Coat: Moorcraft Super Spec DTM Alkyd Satin, Z163
      2) 2nd Coat:Moorcraft Super Spec Urethane Semi-Gloss Enamel
      3) 3rd Coat: Moorcraft Super Spec Urethane Semi-Gloss Enamel
   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
   d.

F. SYSTEM I-6
1. Substrate: Galvanized Metal, Not Chromate Passivated:

2. Applications include but are not limited to doors, frames, 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: match adjacent surface
      3) 3rd Coat: match adjacent surface
   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

G. SYSTEM I-7
1. Substrate: Woodwork (Opaque Semi-Gloss Finish)
2. Manufacturers and Products:
   a. Sherwin Williams:
      1) 1st Coat: S-W Premium Wall & Wood Primer, B28W8111
      2) 2nd Coat: S-W Pro Industrial 0 VOC Semi-Gloss Acrylic B66W651 Series
      3) 3rd Coat:S-W Pro Industrial 0 VOC Semi-Gloss Acrylic B66W651 Series
   b. Benjamin Moore:
      1) 1st Coat: Moore 023 Fresh Start 100 percent Acrylic Primer Sealer
      2) 2nd Coat:N333 Regal Acrylic Latex Semi-Gloss Enamel
      3) 3rd Coat: N333 Regal Acrylic Latex Semi-Gloss Enamel
   c. Glidden Professional:
      1) 1st Coat: Glidden Professional High Hide 1000 primer
      2) 2nd Coat:Glidden Professional Diamond 450 7400 topcoat
      3) 3rd Coat:Glidden Professional Diamond 450 7400 topcoat

H. SYSTEM I-8
1. Substrate: Woodwork (Transparent, Not Floors or Stairs):
2. Applications include but are not limited to paneling and trim:
3. Manufacturers and Products:
   a. Sherwin Williams:
      1) Stain: S-W Minwax 250 VOC Oil Stain
      2) Sealer: Sher-Wood Natural Wood Filler
      3) 2nd Coat: S-W Wood Classics® Waterborne Polyurethane Varnish, Satin
      4) 3rd Coat: S-W Wood Classics® Waterborne Polyurethane Varnish, Satin
   b. Benjamin Moore:
      1) Stain: Moore 234 Benwood Alkyd Wood Stain
      2) Sealer: Moore 413 Benwood Quick-Dry Alkyd Sanding Sealer
      3) 2nd Coat: 423 Benwood Stays Clear Acrylic Low Lustre Polyurethane
      4) 3rd Coat: 423 Benwood Stays Clear Acrylic Low Lustre Polyurethane
   c. Glidden Professional:
      1) Stain: 1700V Wood Pride Water-Based Wood Stain
      2) Sealer: 1808 Wood Pride Water-based Gloss Varnish
      3) 2nd Coat: 1802 Wood Pride Water-based Satin Varnish

4) 3rd Coat: 1802 Wood Pride Water-based Satin Varnish

I. SYSTEM I-9
1. Substrate: Wood Floors and Stairs (Transparent Finish):
2. Manufacturers and Products:
a. Sherwinn Williams:
1) 1st Coat: S-W Wood Classics 250 Stain
2) 2nd Coat: S-W DuraSeal Polyurethane 350 , satin finish
3) 3rd Coat: S-W DuraSeal Polyurethane 350 , satin finish
b. Benjamin Moore:
1) 1st Coat: Penetrating Oil Stain
2) 2nd Coat:Permathane Satin Urethane
3) 3rd Coat:Permathane Satin Urethane
c. Glidden Professional:
1) 1st Coat:1700 Wood Pride Oil-Based Wood Stain
2) 2nd Coat:1902 Wood Pride Polyurethane Satin Varnish
3) 3rd Coat:1902 Wood Pride Polyurethane Satin Varnish

J. SYSTEM I-11
1. Substrate: Plaster (Flat Finish):
2. Applications include but are not limited to walls, ceilings, soffits, and bulkheads.
3. Manufacturers and Products:
a. Sherwin Williams:
1) 1st Coat:S-W ProMar Latex 200 Primer
2) 2nd Coat:S-W ProMar® 200 Latex Flat
3) 3rd Coat:S-W ProMar® 200 Latex Flat
b. Benjamin Moore:
1) 1st Coat: Moore P04 Super Spec HP Acrylic Metal Primer
2) 2nd Coat:N319 Regal Acrylic Latex Flat Finish Enamel
3) 3rd Coat:N319 Regal Acrylic Latex Flat 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

K. SYSTEM I-12
1. Substrate: Plaster (Semi-gloss Epoxy Finish):
2. Applications include but are not limited to toilet rooms.
3. Manufacturers and Products:
a. Sherwin Williams:
1) 1st Coat: S-W ProMar 200 Latex Primer
2) 2nd Coat: S-W ProIndustrial PreCatalyzed WB Epoxy, Semi-gloss, K46
3) 3rd Coat: S-W ProIndustrial PreCatalyzed WB Epoxy, Semi-gloss, 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

L. SYSTEM I-14
1. Substrate: Concrete Floor (Sealed): including but not limited to janitor and utility spaces.
2. Manufacturers and Products:
a. W. R. Meadows:
1) 1st Coat: CS-309/30 Concrete Curing and Sealing Compound
b. Sherwin Williams:
1) 1st Coat: S-W Loxon 7% sealer.

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. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   4. 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. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

I. 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.

J. 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.

K. 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.

L. 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 4000 - 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 1101
VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Markerboards and Tackboards.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking and supports.

B. Section 09 2116 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2009.

B. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.

1.04 SUBMITTALS

A. See Section 01 3000 - 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 7800 - 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. _____.

2.02 VISUAL DISPLAY BOARDS

A. Markerboards: Porcelain enamel on steel, laminated to core.
   1. Color: White.
   2. Steel Face Sheet Thickness: 24 gage, 0.0239 inch .
   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: As indicated on drawings, with concealed fasteners.

7. Accessories: Provide chalk tray and map rail.

B. Tackboards: Linoleum with high cork content and jute backing.
1. Material: Bulleten Board as manufactured by Forbo.
2. Thickness: 1/4 inch.
3. Color: As selected from manufacturer's full range.
4. Backing: Fiberboard, 3/8 inch thick, laminated to tack surface.
5. Size: As indicated on drawings.
6. Frame: Same type and finish as for markerboard.

2.03 MATERIALS

A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, 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. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall, full width of frame.

B. Cleaning Instruction Plate: Provide instructions for chalkboard cleaning on a metal plate fastened to perimeter frame near chalkrail.

C. Chalk Tray: Aluminum, manufacturer's standard profile, one piece full length of chalkboard, molded ends, concealed fasteners, same finish as frame.

D. Mounting Brackets: Concealed.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install boards in accordance with manufacturer's instructions.

B. Secure units level and plumb.

3.02 CLEANING

A. Clean board surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 10 2113.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid Color Reinforced Composite (SCRC) Substrate: (Bobrick SierraSeries)
   1. Toilet partitions.
   2. Urinal privacy screens.

B. Wood veneer with phenolic core toilet compartments.

1.02 RELATED REQUIREMENTS

A. Section 10 2800 - Toilet Accessories.

1.03 REFERENCE STANDARDS

A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - 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, 6 by 6 inch in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Solid Color Reinforced Composite Toilet Compartments:
   1. SierraSeries as manufactured by Bobrick.

B. Phenolic Toilet Compartments:
   1. Partition Systems International of South Carolina; Phenolic Toilet Partitions: www.psisc.com.
   2. CompactWood LLC, 2825 Commerce Parkway, North Port, FL 34289. Tel: 855.295.2206 www.compactwood.com:.

2.02 SOLID COLOR REINFORCED COMPOSITE COMPARTMENTS

A. Toilet Compartments: Solid Color Reinforced Composite (SCRC) Toilet Partitions: Bobrick SierraSeries.
   1. Design Type:
      a. Standard Height.
         1) Door/Panel Height: 58 inches (147 cm).
         2) Floor Clearance: 12 inches (30 cm).
   2. Mounting:
      a. Floor-mounted, overhead-braced with satin finish, extruded anodized aluminum headrails, 0.065 inch (1.65 mm) thick with anti-grip profile.

1) Stile Standard Height: 70 inches (178 cm).
2) Stile Maximum Height: 83 inches (211 cm).

B. Solid Color Reinforced Composite (SCRC) Urinal Screens: Bobrick SierraSeries.
1. Mounting Configuration:
a. Wall-hung.
1) Screen Height: 42 inches (107 cm) with 18 inches (46 cm) floor clearance.

2.03 PHENOLIC TOILET COMPARTMENTS

A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral wood veneer finish, floor-mounted headrail-braced.

B. Doors:
1. Thickness: 3/4 inch.
2. Width: 24 inch.
3. Width for Handicapped Use: 36 inch, out-swinging.
4. Height: 58 inch.

C. Panels:
1. Thickness: 1/2 inch.
2. Height: 58 inch.

D. Pilasters:
1. Thickness: 3/4 inch.
2. Width: As required to fit space; minimum 3 inch.

2.04 MATERIALS

A. Solid color reinforced composite (SCRC) material for stiles, panels, doors, and screens with Bobrick GraffitiOff coating, thermoset and integrally fused into homogenous piece.
1. Composition: Dyes, organic fibrous material, and polycarbonate/phenolic resins.
2. Surface Treatment: Non-ghosting, graffiti resistant surface integrally bonded to core through a manufacturing steps requiring thermal and mechanical pressure.
3. Edges: Same color as the surface.
4. Color:
a. As indicated on Drawings.

B. Phenolic Panel Manufacturer: CompactWood LLC, 2825 Commerce Parkway, North Port, FL 34289. Tel: 855.295.2206 www.compactwood.com:
1. Laminate Material: Complies with NEMA LD3 for Type CGS high pressure laminates.
2. Fire-Rated Grade: Compact laminate with Class A fire rating, with brown core and finish options selected.
3. 8. Surface Texture: As selected by Architect from manufacturer's Standard range with Natural Grain texture.

2.05 ACCESSORIES

A. Head Rails: Hollow anodized aluminum, 1 by 1-1/2 inch size, with anti-grip profile and cast socket wall brackets.

B. Pilaster Brackets: Polished stainless steel.

C. Wall Brackets: Continuous type, polished stainless steel.

D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

E. 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 correct spacing of and between plumbing fixtures.

B. 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.

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 2226
VERTICAL FOLDING PARTITIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Automatic Vertically Retractable Acoustical Wall.

B. All hardware, seals, lifting machinery, electrical controls.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel: Support steel beam and miscellaneous support steel for the lifting machinery

B. Section 09 2613 - Gypsum Veneer Plastering : Ceiling storage pockets along axis of Automatic Vertically Retractable Acoustical Wall.

C. Section 09 2613 - Gypsum Veneer Plastering: Bulkheads and sound insulation above, below, and in the fixed walls at both ends of the Automatic Vertically Retractable Acoustical Wall, as per ASTM E557

D. Division 26 - Electrical: Wiring and connections for main power and control, disconnect switches and key switches

1.03 SYSTEM DESCRIPTION

A. Definition

1. Automatic Vertically Retractable Acoustical Wall (Operable Wall) shall refer specifically to acoustical operable walls that, when in the down position (closed) are hard, rigid, flat, plumb walls, made of a grid of rectangular acoustical panels, and when are lifted (opened), fold upward (vertically) without the use of any manual labor, in a manner similar to an accordion, into a pocket in the ceiling, between roof joists, or up between built in bulkheads. In the down (closed) position, the wall shall be comprised of two vertical planes of acoustical panels, separated by an acoustical air space.
2. The operable wall shall open and close in a manner similar to an accordion, in that all wall panels fold and unfold at the exact same time, at the exact same rate.

B. Standard Drive System:

1. The motor drive assembly is mounted directly above the centre line of the operable wall. Support steel is only required at one location.
2. Used for walls up to the following finished ceiling heights:
   a. Skyfold® Classic 60™: 28’-2” (8585mm)
3. The operable wall shall be opened and closed using two push button switches wired in series with power controlled by a single, three position key switch. Turning the key from the “off” position shall cause the wall to move in the designated direction “up” or “down” once both push buttons are depressed. When hand pressure is removed, the wall shall immediately stop. The operable wall shall stop in a quick and positive fashion without coasting. As a normal part of the operation, it shall be possible to partially open (or close) the wall, stop it and then reverse the operation. There shall be two (2) switches per operable wall, located on opposite sides of the wall at opposite ends of the wall, wired in series. One switch shall be equipped with an LED that flashes fault codes in case of a failure with the electrical system.
4. From a fully open position, the operable wall shall be able to go through its entire cycle of closing and/or opening without any manual intervention.

5. When the operable wall is being lowered (closed) it shall come automatically to rest once it has reached the fully down (closed) position.
6. When the operable wall is being lifted (opened) it shall come automatically to rest once it has reached the fully up (open) position.
7. The operable wall shall automatically and acoustically seal against the floor without the need for any manual intervention. The floor seals shall leave a joint between the floor and the bottom acoustical panels of not more than approximately 2” (51 mm).
8. The operable wall shall automatically and acoustically seal against the two end walls without the need for any manual intervention. The end seals shall act in such a way as not to come into contact with the end walls while the operable wall is in motion. The end seals shall leave a joint between the acoustical panels and the end walls of no more than approximately 1” (25 mm). Seals that rub or brush against the end walls are not acceptable. Once the wall reaches the full down position, the end seals shall activate automatically. The key switch does not need to be held during the deployment of the ends seals.
9. The operable wall shall automatically and acoustically seal against the ceiling without any manual intervention. The top seals shall leave a joint between the top acoustical panels and the ceiling of the pocket of not more than approximately 2” (51 mm).
10. The operable wall shall open and close at a constant nominal speed of approximately 5 to 10 vertical feet per minute (1.5 to 3 meters per minute).
11. When the operable wall is being lowered (closed), it shall stop if the leading (bottom) edge comes into firm contact with any object between it and the floor. The wall will then automatically reverse its direction and ascend for approximately 3 seconds to clear the object. The regular operation of the wall can resume once the obstruction has been removed.
12. The operable wall shall be visibly flat and rigid in the down (closed) position.
13. There shall be no exposed hinges, brackets, screws, and no part of the mechanical system shall be visible when the operable wall is in the down (closed) position.
14. All of the panel edges shall be right angled, with a minimum radius not more than 1/16” (1.6 mm).
15. All of the panels shall be rectangular, nominally of the same size, unless requested otherwise by the architect.
16. Joints between panel, vertical and horizontal, shall be no more than approximately ½” (12.7 mm) wide.
17. Each acoustical panel shall be individually removable using only a screw driver. No special tools or equipment shall be required. The removal of a single acoustical panel shall not affect, dislocate or cause the removal of any adjacent panels or other acoustical panels.
18. The operable wall shall not weigh more than the following:
    a. ~9.4 lbs per ft² (46.0 kg per m²)
19. The preceding weights do not include the motor drive or the architectural finish on the acoustical panels and are based on 24’-0” long x 14’-1” high (7315mm x 4290mm) operable wall.
20. A completely functioning operable wall, tested in full accordance and compliance with ASTM E90 (ISO 140-3), shall achieve, from an independent laboratory, a Sound Transmission Class (STC) rating (Rw value) of not less than the following:
    a. System STC 60 (Rw 59), Panel Construction STC 66 (Rw 64)
21. The operable wall shall be designed to have a design life of at least 10,000 complete closed to opened to closed cycles.

1.04 QUALITY ASSURANCE

A. Proposals for substitution of products or techniques not conforming to these specifications must be submitted at least ten (10) days prior to bidding. Independent test reports which meet the requirements and design specified herein must be submitted to obtain approval.

B. All work and materials specified herein, shall be installed only by qualified representatives and/or installers and/or distributors of the manufacturer, according to the manufacturers written instructions.

C. The operable wall must be manufactured by a certified ISO-9001-2008 company or an equivalent quality control system.

1.05 REFERENCES

A. ASTM E90, Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
   1. Annex A1.15 Operable (Folding or Sliding Walls)
   2. Annex A1.15.3 Operation - "The specimen shall not be designated an operable wall unless it opens and closes in a normal manner. It shall be fully opened and closed at least five times after installation is completed and tested without further adjustments."

B. ASTM E413, Classification for Rating Sound Insulation.

C. ASTM E557, Standard Practice for Architectural Application and Insulation of Operable Partitions.

D. ISO 354, Measurement of Sound Absorption

E. ISO 140-3, Measurement of Airborne Sound Insulation

F. ASTM C423, Measurement of Sound Absorption

1.06 SUBMITTALS

A. Submit manufacturers' technical data for each type of operable wall specified herein.

B. Submit shop drawings showing complete layout of operable wall system based on field verified dimensions. The drawings shall include dimensional relationship to adjoining work. Include details indicating materials, finishes, tolerances, and methods of attachment to building steel and electrical requirements.

C. Submit certified test reports evidencing compliance to acoustical STC (Rw) requirements as specified.

1.07 SITE CONDITIONS

A. The floor underneath the operable wall along its axis, shall be flat to within +/- ¼" (6 mm) over the entire length of an operable wall. The peak to valley undulation of +/- ¼" (6 mm) shall not be closer together than 24" (610 mm) and a peak to valley undulation of +/- 1/8" (3 mm) shall not be closer than 12" (305 mm).

B. Support steel above the operable wall along its axis shall be parallel to the floor within +/-½" (12.7 mm) for the entire length of the operable wall. This includes loaded deflection. The beam must also be parallel to the centre line of the wall within + 1/8" (3 mm), left to right.

C. The fixed walls at either end of the operable wall shall be within +1/4" (6 mm)-0", from plumb vertical.

D. The fixed walls at either end of the operable wall shall be flat to within +0", -1/4" (6 mm).

1.08 WARRANTY

A. Basic Warranty: The operable wall shall be warranted free from defects in material and workmanship for a period of two (2) years or five thousand (5,000) cycles, whichever occurs first, from the date of shipment. Extended Parts Warranty (optional): An extended warranty on parts is available in addition to the basic warranty. It includes coverage on all parts for a period of ten (10) years or five thousand (5,000) cycles, whichever occurs first from date of shipment. Refer to Owner's manual for full warranty details.

B. Acoustical Performance: The operable wall shall retain its acoustical properties for 10 years from the date of shipment providing proper maintenance has been performed on the operable wall.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Basis of Design: Skyfold® Classic™ Automatic Vertically Retractable Acoustic Walls as manufactured by Skyfold Inc. of Baie d'Urfe (Montréal), Québec, Canada and Railtech Composites Inc., Plattsburgh, New York, USA (514) 457-4767. E-mail: skyfold@skyfold.com; Web-site: www.skyfold.com
   1. Product: Skyfold® Classic 60™: System STC 60 (Rw 59), Panel Construction STC 66 (Rw 64)

B. Alternate systems can be used if they meet or exceed the performance criteria outlined in Part 1 - General

2.02 MATERIALS

A. Acoustical Panels
   1. Acoustical panels shall be faced with steel that is compatible with a wide variety of architectural finishes such as paint, vinyl, specialty metals, wood veneer, etc.
   2. Acoustical panels, together with all of the sound insulation, shall be, as much as possible, made of non-combustible or fire-treated materials.
   3. Acoustical panels shall be fabricated to be as stiff as possible in order to satisfy the rigid criteria when the operable wall is down (closed) and to ensure that there is no interference between panels when the wall is in motion.
   4. Acoustical panels shall be architecturally flat with no bowing, oil canning, warping, waviness or any other surface deformation and discontinuity.
   5. Acoustical panels shall have the finish of the architect's choice, provided that the finish has been approved by the operable wall manufacturer to ensure compatibility with the wall panels. The following criteria must be met:
      a. Maximum weight of material: 0.111 lbs/ft² (0.542 kg/m²)
      b. Maximum thickness of material: 1/8" (3mm)
      c. No brittle materials.
   6. Finishes are railroaded onto the panels, applied horizontally along the panel length.
   7. Acoustical panels shall meet the following STC ratings in accordance with ASTM E90 (ISO 140-3) specification as reported by an independent laboratory:

Panel Construction	Fully AutomaticOperable wall
66 STC (64 Rw)	60 STC (59 Rw)

B. Folding Mechanism
   1. The hanging, folding and extension mechanism shall be, as much as possible, made from structural grade aluminum extrusions and structural shapes, in order to minimize the weight of the system.

2. All wear surfaces, such as bushings, spacers, pins, discs, bearings, and sleeves shall be designed to function quietly and with minimum wear, over the 10,000 cycle design life of the operable wall.
3. The hangers, which fasten the lifting mechanism to the support steel, shall be fabricated from steel and shall be welded or bolted to the support steel supplied by others.

C. Motor Drive
1. The motor drive shall be sized properly so that it can open and close the wall effectively over the 10,000 cycle design life of the wall, at the minimum design speed specified in point 1.3.2.8.
2. The folding mechanism shall be designed to function as smoothly, quietly and safely as possible. Wherever possible, ball bearings shall be used instead of bushings and wear surfaces. In no circumstance shall chain or belt drive systems be acceptable.
3. There shall be a wire rope cable for every set of folding mechanism. This cable shall be of 6 x 31 construction aircraft cable and shall be made of galvanized steel. The diameter of the cables shall be sized so that they shall be able to hold the entire weight of the wall, with the appropriate safety factor.
4. The cable wraps on yoyo drums with 2 safety wraps and multiple layers of cable.
5. The line shaft, sized to deliver the required torque with minimum deflection, shall support and rotate the cable drums.
6. Flange bearings shall be used for the drive system, located immediately on both sides of the drum assembly.
7. The motor drive shall be sized to deliver sufficient amount of torque to safely and effectively raise and lower the operable wall over its design life.
8. The motor drive shall use the latest in industry standards in thermal protection, overload protection, quick acting fuses, etc., in order to ensure the safety and reliability of the system.

D. Safety Equipment
1. The operable wall shall employ an electromagnetic type of brake which shall activate firmly, without hesitation, when power is lost to the system. This brake shall have a minimum retarding torque rating equal to 200% of the motor drive's full load torque. The drive system shall be equipped with a manual override and a brake release lever.
2. The operable wall shall employ a dynamic brake, distinct and separate from the electromagnetic brake, in order to lower the wall at a controlled speed of no more than approximately 150% of the normal down speed, in the case of a catastrophic failure in the motor drive's power train. Alternately, the operable wall shall employ a brake, distinct and separate from the electromagnetic brake in order to completely halt the downward motion of the wall in the case of a catastrophic failure in the power train.
3. The operable wall shall employ electrical or other limit switches in order to stop the wall at its up and down travel limits.
4. The operable wall shall employ an over-torque detector in order to sense a jam in the system and to act as an over travel limit in the up direction should the primary limit switch fail to act. This over-torque sensor shall be mechanical, using the motor's torque arm in its over-torque detection.
5. The entire length of the bottom edge of the operable wall shall be equipped with a continuous pressure sensing strip which shall cut power to the motor drive and shall activate the electromagnetic brake, if the sensing edge comes in firm contact with an object, before the operable wall is in the full down (closed) position. The operable wall will automatically reverse direction and ascend for approximately 3 seconds to clear the

obstruction. The power shall remain cut to the motor drive until the switches have been released. The operation of the operable wall can resume once the obstruction is removed.

E. Electrical
   1. The operable wall shall be equipped for a three phase power supply to the electrical control box.
   2. Standard electrical control box will be NEMA 1.
   3. Low voltage wiring (by others). 18 gauge wiring from the switches to the control box.
   4. Switches: Two (2) push button switches wired in series with power controlled by a single, three position key switch. One push button switch shall be equipped with an LED that flashes fault codes in case of an electrical system failure. (Installation and wiring by others).

F. Fabrication
   1. Factory assemble all components, assemblies and systems into the largest possible assemblies in order to minimize the amount of assembly on site.

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect the relevant aspects of the site such as the evenness of the floor, walls, structural steel, etc., and ensure that these are within the tolerances stated in Part - 1 of this specification.

B. Confirm in writing to the General Contractor or contract manager any deviations from these tolerances. Do not proceed until these conditions are made good.

C. Carry out all appropriate field measurements before manufacturing any components or assemblies.

3.02 INSTALLATION

A. Install operable walls in accordance with the manufacturer's printed instructions.

B. The operable wall supplier shall not deliver or install this product until the General Contractor can ensure in writing safe storage and protection for the operable wall for the duration of the project.

3.03 ADJUSTING AND CLEANING

A. Adjust and fine-tune the operable walls to ensure that all seals are operating and sealing properly and that the operable walls are in correct and smooth operation.

B. Clean up any dirt, oil, grime, etc., that may have found its way onto the acoustical panels. Leave the wall in a state of architectural cleanliness.

3.04 SPARE PARTS

A. Ensure the manufacturer has ample stock available for repairs.

END OF SECTION

SECTION 10 2800
TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Accessories for toilet rooms and utility rooms.

B. Electric hand dryers.

C. Grab bars.

1.02 RELATED REQUIREMENTS

A. Section 10 2113.19 - Plastic Toilet Compartments.

1.03 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015.

C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

D. ASTM C1036 - Standard Specification for Flat Glass; 2011.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

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 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and 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. AJW Architectural Products: www.ajw.com.
   2. ASI - American Specialties, Inc: www.americanspecialties.com.
   3. Substitutions: Section 01 6000 - Product Requirements.

C. Electric Hand/Hair Dryers:
   1. Dyson.
   2. Substitutions: Section 01 6000 - Product Requirements.

D. All items of each type to be made by the same manufacturer.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

B. Stainless Steel Sheet: ASTM A666, Type 304.

C. Stainless Steel Tubing: ASTM A269/A269M, Type 304 or 316.

D. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.

E. Adhesive: Two component epoxy type, waterproof.

F. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

G. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: No. 4 Brushed finish, unless otherwise noted.

B. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

C. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 TOILET ROOM ACCESSORIES

A. Toilet Paper Dispenser: Twin Jumbo Roll Dispenser
   1. Product: : Bobrick Model No. B-2892

B. Toilet Paper Dispenser: Multi-Roll Dispenser
   1. Product: Bobrick Model No. B-4288

C. Paper Towel Dispenser: Jumbo Roll Dispenser
   1. Product: Bobrick Model No. B-2860

D. Electric Hand Dryer:
   1. Manufacturers:
      a. Dyson Airblade V.
   2. Substitutions: Section 01 6000 - 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. Product: Bobrick Model No. B-2012

G. Mirrors: Stainless steel framed, 1/4 inch 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. 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 in locations indicated on the drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
1. Grab Bars: As indicated on the drawings.

D. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

3.05 SCHEDULE

A. Toilet Paper Dispenser: Double Jumbo Rool; Provide as shown.

B. Toilet Paper Dispenser: Single Jumbo Rool; Provide as shown.

C. Paper Towel Dispenser: Provide as shown in toilet rooms and one for each sink in the following locations:

1. Annex Labs with multi-station sinks. (Provide 1 per sink.)

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 and one for each sink in the following locations:
   1. Annex Labs with multi-station sinks. (Provide 2 per sink.)

G. Mirrors: As shown in toilet rooms.

H. Grab Bars: 1-1/2 inch diameter. Provide as shown in toilet rooms.

I. Sanitary Napkin Disposal Unit: Provide as shown in toilet rooms.

J. Combination Utility Shelf/Mop and Broom Holder: Provide as shown in custodial closets.

END OF SECTION

SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Refubrish existing fire extinguisher cabinets.

C. Accessories.

D. Fire extinguisher signage.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 21 1200 - Fire-Suppression Standpipes: Cabinet enclosure for standpipes.

1.03 REFERENCE STANDARDS

A. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.

B. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

C. Product Data: Provide extinguisher operational features, color and finish, anchorage details, and other relevant information.

D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

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

F. Maintenance Data: Include test, refill or recharge schedules and re-certification 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. Ansul, a Tyco Business: www.ansul.com.
2. Kidde, a unit of United Technologies Corp: www.kidde.com.
3. Amerex Corporation : www.amerex-fire.com
4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with brass or aluminum valves and with pressure gage.

1. Stored Pressure Operated: Deep Drawn.
2. Class: A:B:C type.
3. Size: 10 pound.

4. Finish: Baked polyester powder coat, color as selected.

2.03 FIRE EXTINGUISHER CABINETS

A. Metal: Existing painted steel cabinet.

B. Cabinet Configuration: Recessed.
   1. Trim: Flat.

C. Verify that cabinets are sized to accommodate extinguishers.

D. Door Glazing: Acrylic plastic, clear, 1/8 inch thick, flat shape and set in resilient channel glazing gasket.

E. Lettering: Vertical, die cut, red.

F. Finish of Cabinet Exterior Trim and Door: Field finished, color as selected..

G. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Extinguisher Brackets: J-Type, formed steel, galvanized and enamel finished.

2.05 ADDITIONAL EQUIPMENT

A. Provide ten (10) Dry Chemical Type fire extinguishers and brackets in addition to those shown on contract documents, to be located by the Authority Having Jurisdiction.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

3.02 PREPARATION

A. Strip paint from existing cabinet doors.

B. Verify hardware is intact and functioning. Replace if defective.

C. Verify door operation is smooth and not binding. Repair if defective.

D. Replace door glazing.

E. Repaint cabinet interior and door.

3.03 INSTALLATION

A. Verify existing cabinet is securely rigidly in place.

B. Place extinguishers in cabinets.

3.04 SCHEDULES

A. Provide wall-mounted fire extinguishers in the following locations:
   1. Mechanical rooms.
   2. Main electrical rooms.
   3. Provide additional extinguishers to limit travel distance within room to 75 feet to nearest extinguisher.

B. Provide fire extinguishers in recessed cabinets in the following locations:
   1. Corridors
   2. Provide additional extinguishers and cabinets to limit travel distance from any point to nearest extinguisher to 75 feet.

END OF SECTION

SECTION 10 5100
LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lockers.
   1. Refurbish, remove and relocate existing metal lockers.

1.02 RELATED REQUIREMENTS

A. Section 04 2000 - Unit Masonry: Masonry base construction.

B. Section 06 1000 - Rough Carpentry: Wood blocking and nailers.

C. Section 09 2116 - Gypsum Board Assemblies: Metal furring over lockers.

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; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate locker plan layout, numbering plan.

C. Mock-up of one refurbished locker.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Lockers:
   1. Penco Products, Inc: www.pencoproducts.com.

2.02 METAL LOCKERS

A. Replace broken, bent and missing locker components.

B. Match existing size, gauge and style.

C. Lockers: made of formed sheet steel, ASTM A653/A653M SS Grade 33/230, with G60/Z180 coating, stretcher leveled; metal edges finished smooth without burrs; baked enamel finished inside and out.
   1. Where ends or sides are exposed, provide flush panel closures.
   2. Provide filler strips where indicated, securely attached to lockers.
   3. Color: To be selected by ArchitectCustom Penco color.

PART 3 EXECUTION

3.01 PREPARATION

A. Salvage existing lockers scheduled to be removed or demolished.

B. Salvage usable components for refurbishing existing lockers to remain.

3.02 INSTALLATION

A. Install lockers plumb and square.

B. Place and secure on prepared base.

C. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.

D. Bolt adjoining locker units together to provide rigid installation.

E. Install end panels and filler panels.

F. Install accessories.

G. Replace components that do not operate smoothly.

3.03 CLEANING

A. Clean locker interiors and exterior surfaces.

END OF SECTION

SECTION 11 5210
AUDITORIUM AUDIO & VIDEO SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 RELATED WORK AND REQUIREMENTS

A. Basic Electrical Requirements

B. Raceways and Conduits

C. Wires and Cables

D. Outlet Boxes

E. Grounding

1.03 SCOPE OF WORK

A. This section requires the fabrication, furnishing, delivery, installation, testing of the sound system and equalization of the sound system as indicated on the drawings and specified herein.

B. The contractor shall provide all materials, equipment, procedures, labor, tools, scaffolds, and incidentals necessary to the scope of work.

C. It is the intention of these specifications that the contractor provides a professional quality, complete and properly operating system in every respect and detail.

D. The contractor shall examine the plans in detail to familiarize him with the scope of the work.

E. The contractor shall assume full responsibility for a complete operating installation, in the required location, in accordance with the contract documents.

F. The contractor shall provide all necessary specialty equipment for the complete sound system installation as specified herein.

G. The contractor shall provide all necessary specialty equipment for the complete sound system as shown on the drawings.

H. Any errors, omissions, or ambiguities found in these documents do not relieve the Contractor of the responsibility of providing all items necessary for complete, safe, fully functional systems. Any errors, omissions, or ambiguities shall be brought to the attention of the Architect/Engineer of Record, Owner, and/or Theater Consultant for clarification.

I. The drawings and specification when taken together communicate the design intent of the system. The contractor is responsible for all engineering, procedures, drawings, equipment, material, means and methods, and contract administration necessary to fully and completely provide and install the system contemplated by these documents.

J. No changes will be allowed for any issue that could have or should have been known at the time of bid. This includes but is not limited to discontinued products.

K. The contractor is solely responsible for meeting all codes and regulations and for the complete code compliance of the finished system.

L. The contractor shall employ the most current best standard practices for all aspects of work.

M. The contractor acknowledges that the consultants' opinion is final.

N. DSP programming, system tuning and complete configuration of all components.

O. Mounting and attachments / attachment points for all speakers, projectors, screens, TVs, cameras and all other equipment unless specifically indicated otherwise.

P. Coordinate fully with all other contractors.

1.04 WORK INCLUDED

A. Auditorium Sound System
   1. Sound reinforcement system. A sound reinforcement system with stereo speaker cluster, digital mixing console, connection plates, system electronics, hardware and accessories.
   2. Production intercom system.
   3. Assisted listening system.
   4. Control booth wire duct. The contractor is to install "Panduit" type plastic wire ducts in the sound booth. These ducts are to carry all necessary cabling between the under counter junction boxes, the processing rack mounted on the wall, and the mixing console. A separate duct is required for each signal level
   5. All speaker rigging.
   6. All rack and console power wiring.

1.05 WORK NOT INCLUDED

A. The following items of work, if required, are included in other sections and must be reviewed by the contractor for impact on this work:
   1. Necessary conduit and raceway runs.
   2. Stage flooring.
   3. Front of house catwalks.

1.06 CONTRACTOR'S QUALIFICATIONS

A. Only qualified contractors shall be used.

B. The work of this section will be contracted to a single firm, referred to as the contractor.

C. The contractor shall be a systems contractor who regularly engages in the furnishing, installation and servicing of professional systems of similar nature, size, scope and complexity to that contemplated by this specification. The contractor shall have done so for a period of not less than five years preceding the bid date.

D. The contractor shall have maintained for the five years preceding the bid date, a suitably staffed and equipped service organization which has continuously offered maintenance and repair services for systems of the nature, size, scope and complexity to that contemplated by this specification.

E. All liens must be satisfied for at least five years.

F. The contractor shall be licensed and insured.

G. The contractor shall be a factory authorized dealer for all major system components (mixing console, speakers, amplifiers, signal processors, wireless systems).

H. The contractor shall demonstrate to the satisfaction of the owner, through exhibits presented with his bid, that the contractor has a history to indicate the following:
   1. Statement of current company capabilities and ownership.
   2. Statement of company history. Include a breakdown by percentage of gross sales of all business activities the contractor is involved in for each of the last 5 years (e.g. system installation = 30%, box sales = 40%, equipment rentals = 20%, design and other professional services = 10%, etc).

3. Previous experience: Provide a list of four installations of the type and size contemplated by these specifications, currently in use as originally installed, in which a theatre / system consultant was involved, completed in the last 5 years and the following information regarding each installations:
   a. Name and address of each installation facility.
   b. Facility owner and telephone number.
   c. Name, address, and phone number of a person regularly employed by the owner, who is familiar with the operation of the systems and who has no connection or business connections with the contractor except as the contractor shall fully disclose
   d. Name, address, and phone number of the theatre / system consultant, along with the names of all the consultant's personal directly involved.
   e. System shop drawing - These will be returned if the contractor provides a call tag or return postage.
   f. Owner's manual drawing - These will be returned if the contractor provides a call tag or return postage.
   g. System as-built drawings drawing - These will be returned if the contractor provides a call tag or return postage.
   h. List of contractors personal involved with each persons responsibility on the project.
   i. Name, address and phone number of the general contractor, along with the names of all key GC personal directly involved.
   j. Name address and phone number of the electrical contractor, along with the names of all key EC personal directly involved.
4. Key Personnel: For each of the key personnel listed below; Include individual's name, title, and number of continuous years of service to contractor. Include a biography detailing industry experience, and role within organization (include only full-time/regular staff employees; not independent contractor, freelance, or temporary positions). List all industry certifications held, training courses attended, and continuing education credits, including dates of attendance. List recently completed projects, scope of project, and completion dates.
   a. Project Manager
   b. Senior Technician
   c. Service Manager
   d. Other Department Staff - Include size of staff, and experience of each staff member.
5. Replacement and Spare Parts Inventory - Provide detailed list of primary replacement parts, components, and spares typically held in inventory.
6. Test Equipment and Physical Plant - Include an inventory of all test facility equipment owned and used regularly by the Service Department. Provide description of physical plant and space utilization.
7. Statement of adequate plant, equipment, test facilities and inventory to pursue the work properly and perform in a timely fashion.
8. Copies of all business and professional licenses and insurance certificate

PART 2 - PRODUCTS

2.01 ALTERNATES

A. In no case will equipment or materials of lesser design or workmanship be acceptable. Only those materials and equipment listed in this specification will be considered unless prior approval is sought and received.

B. Substitutions: When a specific piece of equipment specified has been discontinued and/or replaced by a new model, substitution will be acceptable when:
   1. Submission of complete data on the new model or substitute has been approved by the owner prior to equipment acquisition. Data shall include list pricing for specified and replacement equipment.
   2. Substitute equipment or the replacement of rejected equipment shall be at the sole expense of the contractor.
   3. After submittals have been approved there will be no cost to the owner for any required replacement equipment under any circumstances.

C. Should the contractor proposed and receive approval for the use of alternative wire and cable which requires additional conduit, the contractor will be solely responsible for the installation of such conduit.

2.02 GENERAL REQUIREMENTS

A. The major items of equipment shall be furnished in the quantity as on the drawings and the quantity as specified herein.

B. When documents list several acceptable manufacturers for a particular item of equipment, more than one of which is to be provided, the contractor shall supply all of those similar items of equipment from one manufacturer.

C. The contractor will provide necessary millwork, enclosures, baffles, grille cloth, wall plates, and any other item furnished under this contract not specifically noted otherwise herein or on the drawings in a manner and color as approved by the owner.
   1. Any item of equipment or hardware that may not be specifically shown on the drawings or specified herein but required for proper sound system operation or installation shall be furnished and installed and be of the highest quality available.

D. The performance of all equipment must meet the most recently published manufacture's data sheet.

E. Provide all power supplies (including POE) required.

F. Provide all software, drivers and related items.
   1. Shure wireless work bench
   2. SymNet control
   3. Yamaha StageMIX app
   4. Yamaha "editor"
   5. Dante controller
   6. All others required

G. Provide all equipment in the types and quantities shown on the contract drawings.

H. Provide the equipment in the quantities shown on the contract drawings:
   1. MIX-1: Mixing Console: 64 input capable front of house mixing console, 32 mic in and 2 mini YGDAI card slots. Include 18" gooseneck lamps.
      a. Yamaha QL5
      b. 1 - console cover
      c. 2 - LA1L lamps
   2. CDR-1: Compact disk recorder / player: All inputs and outputs shall be balanced. Include a wired remote.
      a. Tascam SS-CDR200 + RC-20
   3. MED-1: Media player. All outputs shall be balanced

   a. Denon DN-500CB
4. WIR-1: UHF Digital 4 channel Wireless microphone system with Dante audio over Ethernet. Include Shure Workbench control software.
   a. 2 @ Shure ULXD4Q receivers
   b. 8 @ Shure ULXD2/SM58 handheld transmitters
   c. 8 @ Shure ULXD1 bodypack transmitters
   d. 8 @ Countryman B2D lavalier mics w/TA4F connectors
   e. (4 -Tan, 4 -Black)
5. WIR-2: Antenna Distribution System.
   a. Shure UA845
6. WIR-3: Active Wideband Antennas. Include (1) pair active antennas. Provide rigid mounts for the antennas, permanently installed in the correct orientation.
   a. Shure UA870WB
7. PRO-1: Programmable digital signal processor. 8 channel mic/line inputs and 8 line outputs on Euroblock connections.
   a. Symetrix SymNet Edge 8X8 DSP with cards as shown
   b. NOTE: THE FIRE ALARM INTERFACE SHALL BE CONFIGURED IN SUCH A WAY THAT WHEN IN ALARM MODE THE SYSTEM VOLUME SHALL MUTE.
8. PRO-2: External control expansion module
   a. Symetrix xControl
9. ALS-1: Assistive listening system. Channel E.
   a. Listen Technologies Corporation (or equal by Williams Sound)
   b. 1 -model LT-800 transmitter.
   c. 22 -model LR-300 receiver
   d. 22 -model LA-161 earbuds.
   e. 1 -model LA-326 rack mounting kit.
   f. 1 -model LA-116 remote coax antenna.
   g. 1 -model LA-313 carrying/storage case
   h. 1 -model LA-304 wall plaque kit
   i. Include Ray-O-Vac battery accessories below;
   j. 25 -model IC-3 15 minute rechargeable NiMH battery
   k. 5 -model PS6 4-position battery charger
   l. 6 -receptacle power strip with 6’ power cord
10. AMP-1: 900 watt per channel stereo into 4 ohms.
    a. Electro-Voice TG5
11. NET-1: 24 port 10/100/1000 Gigabit Ethernet switch for Dante' audio network.
    a. Summit X440-G2-24p-10GE4 switch
    b. Summit RPS-500p redundant power supply
12. NET-2: Wireless access point.
    a. Summit Wireless AP 3935
13. NET-3: Meyer RMS to Ethernet bridge.
    a. Meyer Sound
14. SPK-1: Main Left/Right speaker.
    a. Meyer Sound CAL-64
15. SPK-2: Left/Right subwoofer speakers. Include all necessary hardware rigging components; rigging tubes, hinge bars, quick release pins, etc., required for speaker suspension..

    a. Meyer Sound USW-1P
16. SPK-3: Front fill speaker. Include mounting brackets and custom mounting hardware as required.
    a. Meyer Sound UP-4XP
17. PSU-1: DS power supply for front fill speakers.
    a. Meyer Sound
18. Cluster rigging: Provide required left and right cluster rigging all necessary flying hardware.
19. ICM-1: Intercom power supply
    a. Clear Com PS 702
20. SWT-1: Not used
21. SWT-2:
    a. Local Control SPST MOM pushbutton switch
    b. Augat MPG-106F
22. LGT-1: Rack Light with power outlets
    a. Furman PL-PRO C
23. LGT-2: Local Control LED indicator light
    a. Dialight 557-1505-203
24. LGT-3: Rack mount light module
    a. Littlite RL-10-D-LED
25. POT-1: Small Event System volume control
    a. 10 k? linear pot with Altas Sound knob
    b. Clarostat RV4NAYSD103A + Atlas Sound HX21-B
26. XFM-1: Stereo consumer to balanced line adapter / driver
    a. Radio Design Labs FP-UBC2
    b. Include remote power supply & wiring
27. RACK RS-1: Floor Mounted 19" roll out/rotating rack. Provide locking door, top and side panels.
    a. Middle Atlantic Products model WR-44-32.
28. RACK RS-2: 12U Counter top rack
    a. Middle Atlantic Products model ???
29. All specialty back boxes listed on the electrical drawings.
    a. CMB-1
        1) Whirlwind BB8X8X4B

I. Panels: All panels are made of 1/8" thick Aluminum plate, brushed anodized black and sealed. All controls and connectors will have engraved labels. The minimum allowable label size is 1/8"s. All labels will be back filled with white paint. All connectors are mounted with machine hardware. All panel layouts and labels must be submitted and approved prior to construction, the panels shown in the drawings are typical only.

J. Microphone Receptacles: The above general requirements for panels apply to the construction of Microphone Receptacles as well. See the contract drawings for quantity and type required.

K. Monitor Speaker Receptacles: The above general requirements for panels apply to the construction of Monitor Speaker Receptacles as well. See the contract drawings for quantity and type required.

L. Intercom Connection Receptacles: The above general requirements for panels apply to the construction of Intercom Connection Receptacles as well. See contract drawings for quantities and types required.

M. Custom panels: See drawings for required components.

N. Connectors:
   1. All XLR cable connectors are Neutrik “XX” series, black bodies, and silver contacts unless otherwise indicated.
   2. All XLR chassis connectors are Neutrik “DLX” series, black bodies and silver contacts unless otherwise indicated.
   3. 6 pin XLR connectors for intercom must be “Switchcraft compatible”
   4. All RJ45 plugs and jacks are Neutrik EtherCON CAT6A
      a. All plugs and jacks shall be color coded sealing covers / rings by function.
   5. All speaker cable connectors are Neutrik SpeakON series “FC”.
   6. All speaker chassis connectors are Neutrik SpeakON NL4MP-ST.
   7. All RCA chassis connectors are Neutrik D-shaped housing, black chrome bodies, solder tabs with white / red isolation washers for stereo left right.
   8. All BNC chassis conenctors are Neutrik NBB75DFIB-P (isolated, feed through, D-shape, black housing, protruding version). Provide color coded (by function) rubber sealing cover.

O. System Wire: All wiring installed in a conduit which is located in the slab must be rated for wet locations.
   1. 10 A.W.G. for speaker lines enclosed in conduit, racks, or speaker enclosures. Use for all speaker runs except 70 volt systems. 10 A.W.G. THWN.
   2. 16 A.W.G. twisted pair for RMS control system and for 70 volt audio wire for use in conduit, racks, or speaker enclosures. West Penn Wire AQC 225 or equal non-wet rated wire where allowed.
   3. 22 A.W.G. shield twisted pair for all mic, line or D.C. control lines enclosed in conduit or racks. Belden 5500F1 or West Penn Wire AQC 291 or equal non-wet rated wire where allowed.
   4. 18 A.W.G. Shielded twisted pair with 18 A.W.G. drain wire for all intercom lines enclosed in conduit or racks. Belden 5300F1 or West Penn Wire AQC 293 or equal non-wet rated wire where allowed. An additional 12 A.W.G. THWN will be required if speaker stations are used. This additional wire shall be used in parallel with the drain wire of the shielded twisted pair cable.
   5. 24 A.W.G. shield twisted pair for all AES/EBU digital audio lines enclosed in conduit or racks. West Penn DA2401 or equal non-wet rated wire where allowed..
   6. Coax Antenna Lines. As called for by equipment manufacture.
   7. UTP Category 6 network cable. Four twisted pair of 24 A.W.G. wire with an outer diameter suitable for termination by standard type RJ-45 connectors. Use for all cable run within a conduit or raceway. Belden 7934A or equal non-wet rated wire where allowed.
   8. Category 5 service cable. Use for all Category 5 cable NOT run within a conduit or raceway. TMB Associates ProPlex Ethernet cable.
   9. RG6 coax for all video cable (including HD-SDI) West Penn Wire AQC806 or equal non-wet rated wire where allowed.
   10. RG 11 coax for wireless receiver antennas Liberty RG11-DB-CCTV or equal non-wet rated wire where allowed.
   11. RG59 coax as required West Penn Wire AQC 815 or equal non-wet rated wire where allowed.

P. SOUND PANEL BOARD : Furnish the following sequenced sound power panel board to the electrical contractor

1. LynTec MSP 338 Series
2. 100 amp main breaker
3. 24 channel sequencer capacity
4. 20 @ motorized 20A bolt on breakers
5. 10 @ non-motorized 20A bolt on breakers
6. SGX20-10 surge protection side car

Q. INTERNAL RACK POWER WIRING:
1. Provide all power wiring, devices, hardware, receptacles, etc. as required to power all equipment within each rack.
2. Provide a junction box located at the top of the rack for connection to circuiting by the electrical contractor.
3. Provide portable power cables for console, any portable racks, and all portable equipment.

R. PORTABLE EQUIPMENT: Provide the following portable equipment that is not shown on the contract drawings:
1. Microphones. Provide a mic clip for each mic.
   a. 6 @ Shure SM-58
   b. 4 @ Shure SM-57
   c. 1 @ Shure VP88
   d. 1 @ Shure SD565
   e. 2 @ AKG C414 XLS
   f. 1 @ Countryman ISOMAX 4RF (M4HP5RF18EB) + AT8416 shockmount
   g. 2 @ Audio Technica 4040.
   h. 2 @ Audio Technica 4041.
   i. 1 @ CT Audio; C-Ducer CP Series CSP/8P.
   j. 5 @ Crown PCC160.
   k. 3 @ Countryman Type 85 Direct Box.
   l. 1 @ Emtech Electronics, Inc. Model EJ-10 multi-input adapter box.
   m. 1 @ Whirlwind PCDI
   n. Microphone Stands & Accessories.
      1) 12 @ Atlas Sound MS12CE
      2) 8 @ K&M KM210/91 black, mic stand w/boom
      3) 1 @ Atlas Sound D7
   o. Intercom belt pack.
      1) 10 @ Clear Com RS-601.
      2) 2 @ Clear Com RS-602
   p. Intercom speaker station (portable)
      1) 2 @ Clear Com KB-701 w/ V-box
   q. Intercom single muff headset.
      1) 12 @ Clear Com CC-300
   r. Intercom dual muff headset
      1) 3 @ Clear Com CC-400
   s. Intercom cable, 6 pin XLR to 3 pin XLR
      1) 3 @ 2-3 pin XLR to 6-pin XLR adapters - Clear Com YC-36
   t. Mic Cables: Whirlwind MKQ series in black.
      1) 12 @ 3 feet
      2) 10 @ 10 feet
      3) 25 @ 20 feet.

4) 25 @ 30 feet.
5) 6 @ 50 feet.
6) 4 @ 100 feet.

u. Speaker Cables.
1) 4 @ Whirlwind NL-4-50
2) 6 @ Whirlwind NL-4-25

v. Patch Cables and Adapters - Audio
1) 8 @ Neutrik NL4MM.
2) 2 @ Switchcraft 389.
3) 2 @ Switchcraft 390
4) 2 @ Switchcraft 387A
5) 2 @ Switchcraft 386A
6) 2 @ Switchcraft 384A
7) 2 @ Switchcraft 383A

w. Monitor and Portable Speakers.
1) 4 @ Electro-Voice ZX3 w/ stand sockets
2) 4 @ Galaxy Hot Spots with volume control and 2 NL4 connectors
3) 4 @ Ultimate Support TS-90B speaker stands

x. Headphones.
1) 1 @ Sony MDR-7506

PART 3 - EXECUTION

3.01 SUBMITTALS:

A. Submittals: The contractor, within thirty days of the bid award and prior to beginning work, shall submit all of the following at the same time to the owner for approval:

B. Drawings: Complete shop drawings details and complete on all phases of installation including a minimum of:
1. Device location plan drawing(s)
2. System wiring diagram
3. Make and model of all equipment
4. All connection points on each piece of equipment
5. All wire types
6. All connector types
7. All cable labels
8. Rack elevations
9. Details of all connection plates and custom panels
10. Rack and equipment labels
11. Mounting and rigging details for all equipment
12. Drawing showing the projector, the screen, the throw distance and all lens calculations in plan, elevation and section.

C. Mountings and Attachments: Prior to equipment installation, the contractor will submit to the owner detailed scale drawings of all proposed enclosures and speaker mounting or rigging weighing more than ten pounds. All mountings and attachments must be approved and stamped by an engineer licensed in New York prior to submittal and the beginning of the installation.

D. Materials and Equipment: The contractor will submit to the owner a complete list of all materials and equipment to be furnished including catalog cuts for all equipment items. These must contain full information on dimensions, construction, applications, etc. to permit proper

evaluation. In addition, they must be properly identified as to their intended use and any options or variations must be clearly marked. The contractor is to confirm equipment availability at time of submittal. It is assumed that all equipment submitted on is and will be available.

E. Test Equipment: The contractor will submit to the owner a list of test equipment to be used to test, equalize and demonstrate the final installation.

F. Schedule: Prior to the commencement of the installation work, the contractor shall submit for approval, to the owner, an outline of a proposed commencement and completion schedule and project requirements.

G. Variations: Any deviation from what is specified here and or shown on the system drawings must be "starred" and noted in ¼" high letters on the shop drawings and highlighted in the submittal data.

H. Approval of shop drawings and materials does not relieve the Contractor of any responsibilities.

3.02 COORDINATION WITH OTHER WORK:

A. The contractor shall specifically coordinate the placement and sizes of conduit relating to this work and shall specifically review and approve the conduit rough-in in time to advise all parties of needed changes, omissions, etc. The contractor shall report this successful coordination in writing to the owner's representative. Failing this, the following will be enforced:
   1. The contractor shall provide and install any additional conduits required for the hookup, proper location and proper isolation of the various cable / signal types and equipment in the systems. The contractor must coordinate his conduit installation with those installed by the electrical contractor. All conduits shall be sized to their intended fill plus fifty percent.
   2. The contractor shall at all times coordinate his work with the other trades to ensure smooth progress of work and satisfactory final results.

3.03 INSTALLATION:

A. Personnel: A single, competent, technically qualified foreman will oversee the entire job from start to finish. This foreman must:
   1. Be present on the job site during all phases of installation and testing.
   2. Be authorized to receive instructions from the Architects or their representatives.

B. Only experienced sound installers shall be employed on this job.

C. The contractor shall keep the job adequately staffed at all times.

D. All job documents pertaining to the installation of this system will be accessible to all workers throughout the installation process.

E. Installation practices shall be in accordance with OSHA Safety and Health Standards and all local codes.

F. The contractor shall not commence the installation of equipment and devices, other than the pulling of cable, until all areas are clean, painted and finished to a point that they are completely dust, dirt, lint, fiber and airborne particle free. The air conditioning system must be operating to its design level and be able to keep all areas with sound equipment stable.

G. General Workmanship:
   1. The installation of all work shall be neat.
   2. All boxes, equipment, etc shall be plumb and square.

3. The installation shall conform to the plans and spec.
4. Equipment racks shall be assembled, wired and tested in the contractors shop prior to delivery to the job site.

H. Wiring:
1. If enclosed in conduit run only similar signal levels in a single conduit.
2. All pulls to be made by hand, care will be taken not to nick cable jackets, and any nicked or damaged cable will be replaced.
3. A pull string will be left in all conduits after wire is installed.
4. NO SPLICES WHATSOEVER IN CONDUIT!
5. If not enclosed in conduit neatly group cables into bundles and secure out of harm's way.
6. Separate cable grouping by signal level. Mic and A.C. power shall be not less than 18" all other levels by not less than 6".
7. Include spare cables with all field runs. Quantity to be 10% or 1 whichever is greater unless otherwise specified.

I. Terminations:
1. All cables shall be permanently labeled at every termination.
2. Service loops of not less than 6" will be present at all terminations to equipment.
3. Where terminal blocks or barrier strips are used only uninsulated fork terminals with a brazed seam, sized according to wire and stud sizes, crimped with notch across from the seam will be approved.
4. Use barrier strips on equipment where provided.
5. Where shielded cable is in use leave shield drain wire the same length as the circuit conductor(s), sleeve shield drain wire in green pvc tubing. Cap where the cable jacket was removed with heat shrink. Where the shield drain wire is to be lifted follow the above and fold back over cable jacket. Then cap end with heatshrink. Do not use a single piece of heatshrink for this use two smaller ones.
6. All soldering will be clean and neat and not exhibit evidence of a " cold" joint, were necessary heat sinks will be used. Use only rosin core "electronic type" solder.
7. Wire nuts will be allowed only for field connections of 70 volt speaker lines and priority attenuation control lines, and then only when the proper size is used.

J. Polarity:
1. The " high " side will be connected to pin 2 on XLR connectors, to tip on 1/4" connectors and to the pin on phono connectors.
2. The " low " side will be connected to pin 3 on XLR connectors, to ring on 1/4" balanced connectors and to case on phono connectors.
3. Microphones will be wired so that an acoustic compression at the diaphragm produces a positive going signal on pin 2 with respect to pin 3.
4. Speakers will be wired so that when a positive going signal is applied to the + or red terminal an acoustic compression is produced.
5. The system will be wired to maintain absolute polarity though all system components to insure that a positive signal on pin 2 or tip produces a positive signal at the + or red speaker terminal.

K. Shield Grounding:
1. Do not tie pin 1 to case of XLR connectors anywhere.
2. Microphone shield drain wires will be grounded only at mixer inputs. Where microphone lines and mixer inputs run though a patchbay, connect shield drain wire to sleeve of patchbay connector and only to this point.

3. Line level lines will have shield drain wire lifted from ground at outputs and connected to ground at inputs.
4. The intent here is to not make ground loops, should any situation arise which would form a ground loop, please inform the owner for direction.

L. Mountings and Attachments:
1. Any and all structural, mounting, or rigging details are shown on the drawings for concept only.
2. The detail drawings and calculations of all proposed mounting or rigging of any equipment weighing more than ten pounds will be approved and stamped by a P.E. who is licensed in Delaware.
3. Each cluster element is to be individually adjustable.
4. Provide for an adjustment range of +/- 10 degrees from the information shown in the contract documents.
5. In the absence of specific direction otherwise, standard rigging practices shall be followed.

M. Labels:
1. Cable Labels: All cables shall be labeled at all termination points. The label shall not be hand written. Clear heat shrink shall cover the label.
2. Equipment Labels. All equipment shall be labeled front and rear. Labels shall functionally describe the use of each piece of equipment. On equipment having multiple channels, each channel shall be labeled. Additionally the equipment label will call out equipment designation which will correspond with the designations shown on the approved contractor's one-line diagram. Labels shall be engraved lanacoid, white letters on black background, with a minimum letter size of 3/16". Approved patchbay labeling may vary from this.

N. Power Sequencing. The system shall turn on and off, in proper order, on circuit at a time, when the power switch is pressed. The power light shall be solid on when all circuits are on, and shall flash during sequencing.

O. The system may not be used prior to checkout.

3.04 INSPECTION AND TESTING:

A. During the installation of the equipment the contractor shall arrange for access as necessary for inspection of equipment by the owner's and/or architect's representatives.

B. Provide a safe means of accessing all system components for all visits.

C. Equipment Pretesting: All racks are to be built and wired in contractors shop and tested prior to delivery to site. All other equipment is to be tested prior to delivery and installation. A written test report will be submitted to the owner.

D. Final Inspection:
1. The final inspection will confirm that the systems, as installed, meets the requirements of this spec, the contract documents, and the approved contractor's shop drawing and submittals.
2. The contractor will inform the owner in writing of the system's completion. The contractor will then request final inspection by the consultant, and carry out the necessary coordination. This coordination includes:
3. Giving at least fourteen days notice to the consultant prior to the final inspection.
4. Arranging for the contractor's and consultant's exclusive use of the space.

5. Arranging for a HVAC technician to be available to turn the AC system on and off as required.
6. Arranging for a lighting technician to be available to control the stage lighting as required.
7. The contractor's job foreman and one additional worker familiar with the job will be present during all check out, testing and tuning.
8. Contractor will complete the following tasks prior to consultant's arrival:
9. Unpack and assemble all portable equipment.
10. Place all portable equipment in one location.
11. If anything has been turned over to the owner have the signed Letters of Transmittal on site.
12. Complete all required paperwork (pre-testing reports, letters indicating successful coordination of the installation, etc.).
13. Remove all security covers.
14. Contractor will provide all necessary software, cables, and interfaces to facilitate the setting of computer, remote controlled, or DSP based equipment.
15. Contractor will either: 1) relocate all system equalizers to a tech area in the house for the duration of system tuning or 2) for remotely controllable devices, locate the control position in a tech area in the house for the duration of system testing. In either case a tech area in the house will be required with a minimum of a 4' x 6' folding table, intercom communications to the rack and console locations, and AC power.
16. Contractor will provide the following test equipment for use during tuning and acceptance testing:
    a. Sennheiser ZP-3 impedance bridge.
    b. Low distortion sine wave oscillator with variable sweep (start frequency, stop frequency, and sweep rate).
    c. Distortion meter.
    d. Oscilloscope dual channel, 100Mhz, .001v/div vertical amp.
    e. Noise generator that will provide pink, white, or bandwidth limited pink noise.
    f. Portable 1/3 octave real time audio spectrum analyzer.
    g. Precision sound level meter with filter set.
    h. Polarity checker.
    i. Precision true R.M.S. reading A.C. millivolt meter with dB scale.
    j. Meyer Sound SIM 3 complete with all necessary accessories and at least 3 matching measurement microphones.
    k. Playback and recording media for testing all supplied source equipment.
17. Contractor will provide safe means to access all system components during the entire commissioning process.
18. Contractor shall provide personal and equipment to make adjustments to the speaker cluster(s), as well as to correct problems, for the entire inspection and testing period.

E. The Theatre Consultant or his representative will conduct all final system tests and equalization adjustments in order to determine final acceptance.

F. In no event shall the theatrical sound systems installation be submitted for final approval or acceptance until any and all elements of the facility that may have a bearing on the system performance, including but not limited to doors, windows, HVAC, carpeting, furniture, wall coverings, interior design elements, lighting and lighting control systems have been completed and are operable. All elements that may effect sound systems operation or performance shall

be "on" and operating during adjustments. The contractor will be responsible for coordinating the requirements of this paragraph with other work on the project.

G. Should more than two trips be required to complete the systems testing, systems tuning, and clearing punch list items, the contractor will be charged for any additional visits. These charges will include:
   1. A minimum of two people at a rate of $1250 per day per person.
   2. Travel expense to and from the job site.
   3. These charges will be paid to the consultant, in advance of the consultant's arrival on the job site.

3.05 MANUALS:

A. Prepare four identical copies of owner's manuals. The owner is to receive two, the consultant receives one and the contractor retains one. Before distribution of manuals submit one copy to consultant for approval. Each manual is to contain the following:

B. System one line drawing including all labeling and changes ("as builts ").

C. Owners manual for each piece of equipment.

D. Contractors service phone number in a conspicuous place.

E. All test reports.

3.06 INSTRUCTION: THE FOLLOWING IS TO BE CARRIED OUT WITHIN TWO MONTHS OF SYSTEM ACCEPTANCE:

A. Provide a total of 12 hours of instruction, on a maximum of two occasions. This is to be time on site, travel time is not to be included within the allotted time.

B. Provide operational assistance for the first usage of the system. This is to be on the owners time schedule but, not to exceed 8 hours.

3.07 WARRANTY

A. Contractor will warrant the system to be free from defects in materials and workmanship for a period of one year from the date of acceptance, or first beneficial use, which ever comes first.

B. Acts of god and owner abuse, or neglect are not covered.

C. During the warranty period the contractor will respond to and correct any call for service within one day of the call. Loaner equipment will be provided if necessary

END OF SECTION

SECTION 11 5213
PROJECTION SCREENS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Front projection screen assemblies.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking in walls and ceilings.

B. Section 26 2717 - Equipment Wiring: Electrical supply, conduit, and wiring for electric motor operated projection screens.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog cuts and descriptive information on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Wiring diagrams for motor operators and actuators, and controls and switches.

C. Shop Drawings: For custom installations, indicate dimensions, verified field measurements, mounting details, and interface with adjacent construction.
   1. Location of screen centerline.
   2. Location of wiring connections.
   3. Seams in viewing surfaces.
   4. Detailed drawings for concealed mounting.
   5. Connections to suspension systems.
   6. Anchorage details.
   7. Accessories.

D. Samples: For screen fabrics, submit two samples 6 x 6 inch in size.

E. Samples: For case and frame finishes, submit two samples 6 x 6 inch in size, illustrating color and texture of finish.

F. Operation and Maintenance Data: Provide manufacturer's operation and maintenance instructions.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Experienced in manufacturing products specified in this section.

B. Installer Qualifications: Experienced in installation of the work of this section.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver projection screens to project site in manufacturer's original unopened packaging. Inspect for damage and size before accepting delivery.

B. Store in a protected, clean, dry area with temperature maintained above 50 degrees F. Stack according to manufacturer's recommendations.

C. Acclimate screens to building temperatures for 24 hours prior to installation, or in accordance with manufacturer's recommendations.

1.06 FIELD CONDITIONS

A. Maintain interior of building between 60 degrees F and __ degrees F during and after installation of projection screens.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide one year manufacturer warranty for projection screen assembly.

PART 2 PRODUCTS

2.01 FRONT PROJECTION SCREENS

A. Manufacturers:
   1. Da-Lite Screen Company: www.da-lite.com.
   2. Draper, Inc.: www.draperinc.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Front Projection Screens: Factory assembled unless otherwise indicated.
   1. Basis of Design: Access XL/Series E as manufactured by Draper, Inc.
   2. Dimensions: As indicated on drawings.
   3. In Auditorium: Motorized, matte light diffusing fabric screen, ceiling mounted.
      a. HDTV Format (16:9). Black masking borders standard.
         1) Diagonal: 270"
         2) Image Area: 133" x 236"
         3) Screen Material: Matt White XT1000E, Draper Part No. 146011.
      b.

C. Matte Light Diffusing Fabric: Light diffusing screen fabric; washable, flame retardant and mildew resistant.

D. Masking Borders: Black, on four sides.

E. Extra Drops: Black; 60 inch.

F. Exposed Screen Cases: Steel; integral roller brackets.
   1. Finish: Baked enamel.
   2. Color: Black.
   3. End Caps: Steel; finished to match case.
   4. Mounting: Wall.

G. Electrically-Operated Screens:
   1. Roller: 2 inch aluminum, with locking device.
   2. Vertical Tensioning: Screen fabric weighted at bottom with steel bar with manufacturer's standard end caps.

H. Provide mounting hardware, brackets, supports, fasteners, and other mounting accessories required for a complete installation, in accordance with manufacturer's recommendations for specified substrates and mountings.

2.02 ELECTRICAL COMPONENTS

A. Electrical Components: Listed and classified by UL as suitable for the purpose specified and indicated.

B. Motors: Direct drive, 110 V, 60 Hz.

1. Screen Motor: Mounted inside roller; three wire with ground; quick reverse type and lifetime lubricated; equipped with thermal overload cut-off, internal junction box, electric brake, and pre-set accessible limit switches.
   a. Electrical Characteristics: 1.2 amps.
   b. Motor mounted on sound absorber.

C. Controls: Three (3) position control switch with plate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate is finished and ready to accept screen installation.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify type and location of electrical connections.

D. Do not install projection screens until climate control systems are in place and interior painting and other finishes are completed.

3.02 PREPARATION

A. Coordinate screen installation with installation of projection systems.

B. Coordinate installation with adjacent construction and fixtures, including ceilings, walls, lighting, fire suppression, and registers and grilles.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.

B. Do not field cut screens.

C. Install screens in mountings as specified and as indicated on drawings.

D. Install plumb and level.

E. Install electrically operated screens ready for connection to power and control systems by others.

F. Adjust projection screens and related hardware in accordance with manufacturer's instructions for proper placement and operation.

G. Test electrical screens for proper working condition. Adjust as needed.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 11 6133
STAGE RIGGING AND DRAPERY SYSTEMS

GENERAL

1.01 SCOPE

A. Intent: This specification covers the fabrication, furnishing, delivery, provision, and installation of Stage Rigging and Drapery systems over the stage and auditorium area. The form of the contract, general conditions, and the project drawings are considered to be part of these specifications.

B. General: Provide all items and work necessary for complete, safe, fully functional systems as specified, including:
   1. Tools, scaffolding, equipment, labor and supervision, even though they may not be specifically enumerated.
   2. Verification of dimensions and conditions at the job site.
   3. Coordination of the work of this section with structural steel, electrical systems, sprinkler systems, HVAC systems, roof drains, conduit, and other such systems whether under this contract or performed under a separate, prime contract.
   4. Notification to the Architect/Engineer of any conditions, measurements, quantities, or other data, as required for proper execution, fit and completion of all work, and for safe and proper operating clearances.
   5. Shipment of equipment to job site and the secured storage of all non-fixed equipment.
   6. Installation and completion, in accordance with these specifications, related drawings, the equipment manufacturer's recommendations, established trade criteria, and all applicable code requirements.
   7. Inspection, demonstration, and necessary adjustment of the completed installation by the Stage Rigging and Drapery Contractor's installation personnel.
   8. Preparation and submission of complete record drawings and operational and maintenance data and certificates.
   9. A one year inspection by the Stage Rigging and Drapery Contractor.

C. Definitions: For this project, the following entities are referenced:
   1. Owner: New Castle County Vocational Technical School District, Wilmington, DE
   2. Architect: ABHA Architects, Wilmington, DE
   3. Theatre Consultant: Scheu Consulting Services, Inc., Fayetteville, NY

D. Errors and Omissions: Any errors, omissions, or ambiguities found in these documents do not relieve the Stage Rigging and Drapery Contractor of the responsibility of providing all items necessary for complete, safe, fully functional systems. Any errors, omissions, or ambiguities shall be brought to the attention of the Architect/Engineer of Record, Construction Manager, Owner, and/or Theater Consultant for clarification.

E. BASE BID Work Included: The work of this section shall include, but not be limited to the following:
   1. Provide Stage Rigging and Drapery systems as described herein and as shown in the drawings
   2. Coordinate mounting and installation of Roll Drop hoists, stage lighting raceways, stage draperies and support pipes, and other systems provided by the Tension Wire Grid and stage lighting contractors.
   3. Systems include, but are not limited to:
      a. One (1) each stage lighting hoist system over the auditorium seating

b. Four (4) roll drop hoists for use as stage side masking legs, mounted under the Tension Wire Grid system
c. Dead hung stage rigging for Main Valance, Main Curtain, and horizontal masking borders (borders mounted under Tension Wire Grid system)
d. Side masking legs on swing arm tracks (downstage)
e. Rear masking/divider walk-along curtain and track system

F. ALTERNATE System:
1. Hoisting systems and schedules shown on contract drawing TE-6.0 are an alternate to the base bid tension wire grid systems specified in Section 11 6133. All other items (dead hung battens, tracks, curtains, roll drop hoists, etc.) are to be provided as specified for the Base Bid system, unless modified per the schedules and designs shown on TE-6.0.
2. Contractor is solely responsible for means and methods of the implementation of this alternate system, upon approval of submitted shop drawings and system details. Manufacturers' standard equipment is acceptable provided it meets system design and performance intent.
3. Stage Rigging and Drapery contractor is solely responsible for the coordination of these systems with the work of others.
4. Stage Rigging and Drapery contractor is solely responsible for any additional support steel or other structures required to support their equipment, if not specifically shown in this drawing.
5. Hoists shall have the following minimum performance characteristics:
a. Minimum 800 lb live load capacity, exclusive of assembly self-weight including safety cage, lighting connector strip, power and control feed cables for stage lighting and other permanently installed equipment.
b. Lifting speed +/- 20 fpm, fixed
c. Mechanical overspeed protection
d. U/D/UU/UD hard struck, mechanical limits (4 pole)
e. Power and lighting control data cable handing shall use pantograph system or by cable reel(s). See stage lighting drawings for the number of circuits required for each hoist.
6. Control system shall have the following minimum characteristics:
a. Integration with Roll Drop and auditorium (FOH) stage lighting hoists
b. Graphical user interface (i.e. LCD or LED screen. May be touch screen type)
c. User and administrative operational levels with password, pin, or key lock protection
d. Four (4) user defined soft limits (for positioning - excludes U/D/UU/UD hard struck limits on the hoist assembly itself)
e. Re-setable (twist) illuminated red E-stop mushroom button
f. Positioning feedback
g. Overload protection
h. Slack line detection
i. Hoist selection with "Hold to run" operation
j. Remote control pendant with 30'-0" cable (hoist selection, run, and e-stop functions minimum)
k. Keyed system on/off
l. Surface mount enclosure

1.02 GENERAL REQUIREMENTS

A. Field Conditions: This project is the provision and installation of new Stage Rigging and Drapery systems within an existing and renovated historic venue. All bidders shall fully inform

themselves of the conditions under which the work is to be performed. No additional compensation or time extension will be given for conditions of which bidder could have been fully aware prior to bid.

B. Safety: The systems shall conform to all applicable code requirements and shall be provided and installed in conformance to industry standards of operation and practices. All materials, arrangements, and procedures shall comply with applicable code requirements, allowing the end user to arrange and operate a safe assembly and working environment for audience and user's personnel.

C. Insurance: In the absence of more stringent requirements, the Stage Rigging and Drapery Contractor shall maintain sufficient injury and property liability insurance coverage throughout the project's scheduled timetable, including workmen's compensation coverage for the Stage Rigging and Drapery Contractor's employees.

1.03 STAGE RIGGING AND DRAPERY CONTRACTOR QUALIFICATIONS

A. All equipment and installation shall be the responsibility of a single contractor who shall own and operate a full-time, staffed shop for the fabrication and/or assembly of stage equipment. This Contractor shall assume complete responsibility for the design, fabrication, transportation, and installation of the work in this Section, and shall hold the Owner, Architect, Theater Consultant, and all their Employees and Consultants harmless for any costs for errors or omissions associated with the work of this Section and any action arising there from.

B. If the Stage Rigging and Drapery Contractor does not manufacture or fabricate the major components of the Stage Rigging and Drapery systems themselves, then they shall be a manufacturer's authorized dealer and installer of that manufacturer's equipment.

C. The Stage Rigging and Drapery Contractor shall have at least ten (10) years' experience in the installation of similar equipment and systems for professional and educational theaters. If requested, the Stage Rigging and Drapery Contractor shall submit a representative list of professional theater installations.

D. The Stage Rigging and Drapery Contractor shall be a member in good standing of the Entertainment Services and Technology Association (ESTA) and maintain qualifying membership for the duration of the project.

1.04 SUBMISSIONS

A. Drawings:
   1. Submit plans, elevations, sections, and equipment schedules to the Architect of all systems, components, installation methods, and schedules showing all information necessary to fully explain the design features, appearance, function, fabrication, load ratings, installation and use of system components in all phases of operation.
   2. The drawings shall be no less detailed than those provided in the contract documents.
   3. All drawing shall be reviewed and sealed by a State of Delaware Professional Engineer familiar with the manufacture and installation of stage rigging systems.
   4. System plans, elevations, and sections shall be submitted on minimum D-size (24x36) sheets, and shall be drawn in no less than 1/4"=1'-0" scale.
   5. Submit in a form (electronic or hard copy) and in quantities as required by the Architect,

B. Catalog Cuts: In lieu of detailed equipment drawings, the Stage Rigging and Drapery Contractor may submit catalog cuts for standard, unmodified equipment.
   1. All catalog cuts shall contain full information on dimensions, construction, applications, load ratings, etc., to permit proper evaluation.

2. Catalog cuts shall be properly identified as to their intended use. Any options or variations shall be clearly noted.
3. Detailed drawings of any modified standard equipment shall be submitted for approval as described in Section 1.04.A.
4. Catalog cut sheets shall be prepared and bound in a professional manner, with each sheet properly indexed to a "Table of Contents". Loose or stapled sheet sets are not permitted.
5. All copies of catalog cut sheets must be clear and legible.
6. Submit in a form (electronic or hard copy) and in quantities as required by the Architect,

C. Samples: Provide samples of all fabrics and color choices for selection and approval. Hardware or component samples shall be provided upon written request. Submit in quantities as required by the Architect

D. Approvals: All submissions must be approved per the requirements of the project's general conditions prior to the beginning any fabrication, installation, or erection. Such approval does not relieve the Stage Rigging and Drapery Contractor of the responsibility of providing equipment in accordance with the specifications or of providing fully operational and safe systems.

1.05 WARRANTY & INSPECTIONS

A. Warranty: The Stage Rigging and Drapery Contractor shall provide a one (1) year written guarantee against defects in materials and workmanship. Within this period, the Stage Rigging and Drapery Contractor shall provide any required maintenance or replacement within 30 days of written notification by the Owner, except for safety related items that shall be corrected within 48 hours of notification. Subsequent to the expiration of the guarantee period, the Stage Rigging and Drapery Contractor agrees to furnish repair and maintenance service, at the Owner's expense, within 30 days of request for such service.

B. The warranty period shall being upon final written acceptance of the systems by the Owner.

C. One Year Inspection: At one year after the date of final acceptance, and as part of this contract, the Stage Rigging and Drapery Contractor shall provide a comprehensive inspection of all installed systems and components. Make all adjustments as may be required by normal wear and tear. This inspection shall be scheduled directly with the Owner and shall be done at the Owner's convenience.

D. Continuing Inspections: The Stage Rigging and Drapery Contractor shall offer the Owner estimated costs of a safety inspection and training program to be performed yearly. This program may include systems other than the stage rigging, such as production lighting and audio systems, as well as general backstage safety, at the discretion of the Owner and Contractor.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Quality Statement: While the equipment specifications contained herein may be based upon the standard equipment of particular approved manufacturers, the individual component specifications are provided solely to set a minimum level of quality. Under no circumstances will equipment of lesser quality be accepted for this project.

B. Proprietary Equipment and Substitutions:
1. Whenever any product is specified by reference to the name, trade name, drawing, make or catalog number of any particular manufacturer or supplier, or by the very nature and/or detail of its specification is based on a proprietary product, the intent is not to limit

competition, but to establish performance criteria and a standard of quality which has been determined as necessary for the Project.

2. A Contractor may, at its sole option, use standard products of pre-approved manufacturers, provided the equipment, systems, and installation is approved by the Architect, Consultant and the Owner, in accordance with the submittals approval procedures outlined in the project's General Conditions.
3. In all cases the Architect shall be the sole judge as to whether a proposed product is to be approved. The Contractor shall have the burden of proving, at its own cost and expense, to the satisfaction of the Architect, Consultant, and Owner, that the proposed product is similar and equal in performance and safety to the specified product. In making such determination, the Architect, Consultant and/or Owner may establish such objective and appearance criteria as they deem necessary that the proposed product must meet in order for it to be approved.
4. If the proposed product requires revisions or additions to any supporting building infrastructure (i.e. structural, electrical and/or mechanical), as detailed in the project's complete contract documents at the time of bid, the Contractor assumes all responsibility for the coordination of the proposed product with the building infrastructure, the work of other trades, and any costs of additional infrastructure as may be required to provide the substitute product.

C. Approved Equipment Manufacturers: Due to the highly specialized nature of these system and related equipment, and the safety requirements of the equipment, all fabricated and other provided components shall be manufactured, supplied, and installed by one or more of the following approved manufacturing contractors or their authorized representative/dealer:
1. Electronic Theatre Controls, Middleton, WI
2. InterAmerica Stage, Inc., Sanford, FL
3. Rigging Innovators, Inc., San Antonio, TX
4. JR Clancy, Inc., Syracuse, NY
5. Texas Scenic Company, Rockville, MD
6. Hoffend & Sons, Victor, NY
7. Thern Stage Equipment, Winona, WI
8. H&H Specialties, El Monte, CA
9. Automatic Devices Company, Allentown, PA

D. Other manufacturing contractors seeking acceptance must submit the following information at least 2 weeks prior to the bid opening date. Approval of contractors will be by addenda.
1. Information showing compliance with part 2.02 "Performance Requirements".
2. A listing of ten equivalent installations (name and address of project and owner, architect, consultant, size of project).

2.02 STANDARDS

A. Materials shall conform to the following ASTM and ANSI standard specifications:
1. A-36 Specification for structural steel
2. A-47 Specification for malleable iron castings
3. A-48 Specification for gray iron castings
4. A-120 Specification for black and hot-dipped zinc-coated galvanized steel pipe for ordinary use
5. B18.2.1&2 Specification for square and hex bolts and nuts

B. In order to establish minimum standards of safety, the following factors shall be used:
1. Cables and Fittings 8:1 Safety factor

2.	Steel	1/5 of yield
3.	Bolts	SAE J429 Grd 5 (ISO R898 Class 8.8) Zinc plated
4.	Motors	1.0 Service Factor
5.	Gearboxes	1.0 Mechanical Strength Service Factor

C. Materials: All materials used in this project shall be new, unused, and of the latest design. Refurbished and obsolete materials are not permitted.

D. Fabrication:
   1. The mechanical fabrication and workmanship shall incorporate best practices for good fit and finish. There shall be no burrs or sharp edges to cause either a hazard or present any sharp corners accessible to personnel.
   2. All moving parts shall have specified tolerances.
   3. All equipment shall be fabricated and installed to facilitate future maintenance and replacement.

E. Finishes:
   1. Provide standard manufacturer's finishes except where noted.
   2. Turnbuckles, clips, tracks, chains, and incidental hardware shall be plated or painted.

2.03 RIGGING EQUIPMENT SPECIFICATIONS

A. Front of House/Auditorium Stage Lighting Hoist - General
   1. Hoists shall be purpose-designed and fabricated for overhead lifting of theatre lights, equipment, curtains and scenic elements, whether used on stage, in the auditorium or other places of public assembly where people shall move beneath the suspended or moving load. The systems shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. The mechanical, electrical and safety features of this hoisting and control system shall establish the standard of quality, performance and safety by which hoisting systems of other manufacture shall be evaluated.
   2. Alternate hoisting systems configured as multiple drum type driven by a common shaft (lineshaft assembly) or "yo-yo" type pile-up drums shall be permitted provided they meet all other functional and safety criteria described in this section.
   3. Systems utilizing cable cradle or pantograph style stage lighting cable handling systems shall not be permitted. Systems utilizing spring loaded or motorized cable reel cable handling systems shall be permitted.
   4. Paint as required under this section shall be the manufacturer's standard finish and color except as noted.
   5. All equipment items shall be new and conform to applicable provisions of Underwriters' Laboratories (UL), American Standards Association (ASA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) Life Safety Code 01, National Electric Code (NEC) And PLASA.

B. Front of House/Auditorium Stage Lighting Hoist
   1. Each wire rope lift line shall adhere to a design factor of 10:1 with an ultimate strength of 4200 pounds. All load path components between the building structure and the batten shall exceed the breaking strength of the wire rope. The motor brake shall be rated at least at 125% of the motor torque.
   2. Hoist shall be capable of supporting the following loads:
      a. 30 fpm 1,000 pound "live load" capacity in standard configuration.
   3. The hoist shall include the following features:

a. A powerhead containing the following elements: the gear motor, motor brake, load brake, limit switches operating electronics, load cell, slack line detector, absolute position sensors, cable drum assembly, and wire rope.
b. A compression tube that prevents hoist system lateral forces from transferring to the building. Hoists or hoisting systems that impose a lateral load on the building shall not be acceptable.
c. The hoist shall incorporate a built-in load cell.
d. The hoist shall incorporate a built-in slack line sensor.
e. The hoist shall include the emergency contactor built into the hoist.
f. Hoists that do not include built-in load cell, built-in slack line detection, and an emergency contactor shall not be acceptable.
g. Hoists that do not use absolute position encoders shall not be acceptable.
h. The hoist shall be manufactured from UL listed components and where possible shall be UL listed and tested as a complete system.

C. Powerhead
1. The powerhead shall be a fully enclosed, powder coated sheet metal housing that shall prevent contact with moving and electrical parts and shall provide protection against dirt, dust and debris.
2. Hoist assemblies that do not have metal or plastic housings or covers prohibiting access to moving motor parts shall not be acceptable.
3. For setup and maintenance, the following functions shall be available from the powerhead: power and operating switches, address setting knobs, limit switch setting knobs, limit switch override button, indicators for power, status and communication. Each of these functions shall be clearly labeled.

D. Gearmotor and Motor Brake
1. The gear motor and motor brake shall be an integral unit from a single manufacturer. It shall operate on 208 volt or 480 volt 60 hz, 3 phase current (TBD) for fixed speed units.
2. The motor brake shall be integral to the gear motor and shall be capable of holding 125% of the motor full load torque.
3. The motor brake shall be spring actuated to apply and hold braking force.
4. The motor brake shall be magnetically released and held open upon actuation.

E. Load Brake
1. Fixed speed hoists
a. The rotary disk load brake shall bring the moving load to a complete stop and shall hold the load in position in the event of a mechanical failure of the motor, motor brake or gearbox.
b. Noise from the load brake shall be minimally audible at any time in the operational cycle.
c. Normal hoist operation shall not be limited by heat or noise caused by the load brake.
d. The load brake shall be mechanically released when the load is moving in the up direction. The load brake shall close when the hoist has stopped. The load brake shall always be engaged when the load has stopped moving either up or down. When lowering the load the load brake shall partially disengage to allow and control descent of the batten. The load brake shall remain closed in the absence of rotational torque on the gearbox.

F. Wire Rope Drum: The drum shall be capable of wrapping up to eight 3/16” diameter 7 x 19 galvanized aircraft (utility) wire rope lift lines up to 50’ long in a compact manner. They shall

be managed by a wire rope (cable) keeper integral to the powerhead. The drum design shall prevent wire rope from tangling or crossing over itself.

G. Limit Switch: A limit switch assembly shall be mounted within the powerhead for hard "normal" and "ultimate" end of travel limits. Hard end of travel limits shall be set/adjusted at the time of installation aided by an indicator light visible on the bottom panel of the powerhead cover. Any system that indicates that the limit has been set by audible or tactile means only shall not be acceptable.

H. Load Sensor/Load Profiling.: A load sensor shall be built into the powerhead to create a profile of the actual load on the hoist as it travels through its normal cycle. The profile may be changed by "re-training" the profiling system whenever the suspended load is changed on the batten by activating a key-switch operated training cycle on the motor controller. The load sensor shall continuously monitor the load when load sensing is turned on.

I. Position Sensor: A position sensing system shall be built into the powerhead to provide accurate position information. The system shall consist of two absolute sensor types that provide accurate position information for each batten at power-up of the system. Hoisting systems that require re-homing shall not be acceptable. Incremental encoders shall not be acceptable for position readout purposes.

J. Slack Line Detector: The slack line detector shall be built into the powerhead. When a slack line condition in excess of 15" develops in a lift line, the slack line detector shall remove power from the hoist. The batten shall be allowed to move only in the upward direction to allow removal of the cause of the slack line fault.

K. Local User Interface to Powerhead: User interface at the powerhead control panel at the rear of the hoist shall include:
   1. Hoist up/down control
   2. Limit switch override buttons (tool accessible)
   3. Address switches
   4. Status LED's

L. Compression Tube and Beam Clamps
   1. The compression tube shall be a continuous channel of extruded aluminum engineered in conjunction with the beam clamps to neutralize rigging-generated lateral forces on the building.
   2. The compression tube shall support the system loft blocks.
   3. Compression tube sections shall be joined into a continuous assembly by a pair of dedicated splicing plates at each tube joint.
   4. The compression tube shall be installed only by means of dedicated beam clamps that allow the compression tube to snap into place and to fractionally move horizontally under load.
   5. Beam clamps shall be capable of attaching to horizontal beams, joists, truss flanges or flat steel plates measuring from 1/4" thick up to 1" thick and from 4" wide up to 14" wide placed no more than 14'-0" apart. Beam clamps shall accommodate up to ½" vertical misalignment.
   6. Hoist systems that do not neutralize hoist generated lateral forces on the building shall not be accepted for this project.

M. Loft Blocks
   1. Each loft block shall be an assembly of steel side plates, a wire rope idler, sheave, bearings, shaft locked against rotation and support hardware. Each loft block shall be

inserted into the slot on the bottom of the compression tube. The blocks shall be positioned no closer than 4'-0" from each other, unless muled.

2. Loft block sheaves shall measure 5" in diameter and contain a pair of press fit sealed ball bearings. Lift lines shall travel in a groove shaped and sized for 3/16" diameter wire rope per the latest edition of the wire rope users' manual as published by the wire rope technical board. The loft block sheave shall be concentric about the hub and shall be evenly balanced for ease of rotation.
3. An idler shall be incorporated into the top assembly of the loft block to guide and support lift lines as they pass the block.
4. Hoisting systems requiring the loft blocks to be mounted directly to the facility structure shall not be accepted for this project.

N. Hoists Lift Line Terminations
1. Each lift line shall be terminated in the powerhead via a standard copper oval compression sleeve installed/crimped at the factory.
2. Lift lines shall be terminated at the load hanger with a low profile right angle cable adjuster (RACA), thimble, and copper oval compression sleeve. The RACA and cable terminations at the batten shall be installed at the time of hoist installation.
3. Batten trim shall be adjustable up to 6" via the RACA.
4. Systems utilizing turnbuckles or chain to trim the batten shall not be accepted for this installation.

O. Raceway Hangers
1. Raceway hangers shall be specially shaped flat bar that shall support the wire rope termination hardware and secure the raceway and the pipe batten.

P. Cable Management for Electrics
1. Cable management for electrics
   a. The load circuits and control wiring shall be fed to the distribution trough by a built-in cable management system provided by the stage rigging contractor that allows flat feeder cable to fold and store along the top of the connector strip
   b. At high trim, the entire system shall be stored in 30" of vertical space from the bottom of the mounting steel to the horizontal centerline of the batten.
   c. The flat cable shall meet the physical as well as thermal requirements of UL for 20 amp loads. Up to four flat cables may be fed from each end of the distribution system to provide power for up to 24 circuits from each end of the system for a maximum of 48 total circuits.
   d. Each flat cable shall include one ground wire and one data cable plus an individually insulated hot and an individually insulated neutral conductor for each of six 120 volt 20 amp circuits.
   e. The connector strip shall be built to the length specified with outlets or pigtails located as specified or as shown on the construction drawings. Plug-in outlets shall be flush mounted 15 amp grounded pin connectors.
   f. The distro trough may also contain connectors for Ethernet and/or DMXFlat cable shall pass through a strain relief before entering a termination box at the designated end of the raceway. Within the raceway all wiring shall be attached at the factory to a terminal block. The flat cable, internal wiring and all components shall meet UL requirements and appropriate national electrical codes (ems utilizing cable management systems from third-party vendors shall be fully integrated into the hoisting system without additional structural changes or changes to the controller. Electrics line set hoisting systems that do not fully integrate cable management in the

hoisting system and controller shall not be acceptable for this installation. Cable management systems that are not UL listed shall not be accepted for this installation.

2. Connector strip-Distro
   a. The Powered/Distributed Dimming Raceway shall be furnished by the stage lighting contractor and installed on the hoists batten by the stage rigging contractor.
   b. Field wiring of stage lighting power and control circuitry shall be by the Electrical Contractor
   c. See stage lighting drawings and specifications for circuitry and additional information.
   d. Coordinate all requirements with stage lighting and electrical contractors

Q. Power and Control Distribution (PCD)
1. Each hoist shall receive power and control via a pair of 8'-0" long cables extending from the powerhead to the source outlets. Receptacles shall be installed in a sheet metal junction box or trough with outlets. Each outlet shall be located no more than 6'-0" away from the rear face of each hoist.
2. Each powerhead shall include a power cord hardwired to the hoist with an appropriately sized grounded twist-lock connector at the PCD end and a removable control cable with a circular 9 pin connector at each end. An appropriately rated 3 phase breaker in the PCD is included. The wiring and connectors shall be barriered between high and low voltage.
3. The power/distribution channel shall be UL listed for this application.

R. Control
1. The entire motor system shall be operated by a fixed speed controller. It shall be purpose-designed and fabricated to manage and operate motors specifically designed for overhead lifting. Each system shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment and shall provide an engineered, efficient device to control the equipment. The mechanical, electrical and safety features of this control system shall establish the standard of quality, performance and safety by which motoring systems of other manufacture shall be evaluated.
2. The Control System shall consist of a flush mounted primary control panel with locking cover.
3. The control system shall also include one remote control device with 30' of flexible cable that may be attached to the system at the control panel.
4. The controller shall include the following features:
   a. Key operated power switch
   b. LCD display for feedback/operating information
   c. Key operated motor load profile training/enable switch
   d. Latching motor selection buttons with rear illuminated naming tabs
   e. Rear illuminated hold-to-operate (dead-man) up and down operation buttons
   f. Dedicated E-stop button
   g. Outlet for wired remote

S. Control Enclosure
1. The Control Enclosure shall be a surface mounted assembly to be installed stage right as shown on the drawings. Coordinate location with other devices being provided in that area by the stage lighting, AV, and electrical contractors.
2. The back box and face panel shall be fabricated from 16 ga powder coated sheet steel specially formed to provide support for installation as well as support for all components installed within the housing.

3. The face panel shall be printed with complete labeling information to identify the function of each of the buttons in the control station.
4. The face panel shall identify the system as a controller for stage rigging.
5. The ring surrounding the E-stop button shall be safety yellow and shall be rear illuminated

T. Control LCD Screen
1. The liquid crystal display shall be purpose designed to communicate all information in easily readable text.
2. The screen shall be rear illuminated.
3. During system start up the screen shall show the progress of the motors diagnostics self-tests. Upon completion of the startup sequence the screen shall indicate that the system is "OK" or shall provide specific information should a fault be detected. Fault conditions shall be reported in human readable text. Systems that report fault conditions in a series of blinking lights shall not be acceptable for this installation.
4. When a motor is selected the LCD screen shall readout the motor name or number, its current position above the floor, the amount of weight suspended from the batten, the preset position that is recorded, as well as a bar graph scale that shows the current position of the motor, top and bottom limits and the current weight suspended from the motor.

U. Motor Selection/Operation Buttons
1. There shall be rear illuminated motor selection buttons. Buttons shall remain illuminated until de-selected.
2. Up to three motors may be selected to move at one time. When the up or down button is pushed and held, each motor shall move to its next stop location. If the stop location is the adjustable preset, the motor can be made to continue to travel in the selected direction by releasing and re-pressing the up or down hold-to-operate button until the next stop for the motor(s) is reached.
3. A maximum of three motors may move at one time and only in one direction at a time.
4. As a backup, there shall be dedicated hardware to detect and disable the system when the user attempts to move more than the configured maximum quantity of motors.
5. All buttons shall fit neatly within each of the cover panel cutouts on the controller.

V. Key Switches
1. A key switch shall control power to the control system. The key must be in the lock and the key turned to the on position for the motoring system to operate.
2. A separate key is required to turn on the load profiling system. That key must be in the lock and turned to the "ON" position for load profiling to function.
3. When load profiling is turned on the motor shall know the amount of weight that is supposed to be supported by the batten at any location in the path of travel. Should the weight exceed or be reduced below the profiled weight by a preset value, the motor shall stop operation until the fault is cleared.

W. Slack Line Detector: The slack line detector is located in the hoist assembly. When a slack line condition occurs, it shall cease motor movement and result in a fault message on the LCD screen on the controller. Movement in the upward direction shall be possible to clear the fault.

X. E-Stop: The E-stop button on the controller shall be a mushroom button with a rear illuminated ring surrounding the button. During normal operation the E-stop button shall be in the out position. An E-stop can be activated via this button by firmly pressing the button in. The button shall latch and immediately cause a class zero stop of all motors in the system. The LCD

screen shall report this as an E-stop fault. To continue system operation the E-stop button must be cleared by twisting the button to release the latch. Power to the control station must be cycled off/on to re-initiate the system. This action shall also initiate a self-test of the entire control system and contactors.

Y. System Diagnostics
1. Upon energization, the control system shall perform an automatic series of diagnostic tests that assure that all system safety functions are working. Should an error in the safety functions be determined, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
2. Monthly, the system automatically shall perform an additional series of diagnostic tests to determine if there are any problems with any portion of the motor control system safety features. In the event of a problem, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
3. Eleven months after a system inspection has been performed, the system shall remind the user to schedule full system maintenance/inspection. The reminder shall remain in the system with a count-down calendar until it is turned off by the factory authorized and trained inspector.
4. The installing contractor shall be able to leave contact information within the system. This information shall be displayed at power up and in the event of severe fault conditions.

Z. Remote Control Pendant
1. A remote control pendant with 30’ long attached cable and plug shall be provided for the system. The remote control shall plug to the control panel. When the remote control is plugged in, the E-stop on the remote shall be active. Systems requiring “shunt plugs” to bypass an unplugged remote control connector shall not be acceptable.
2. The remote control shall provide up/down control for those motors that have been preselected at the main controller.

AA. Roll Drop Hoists
1. The Roll Drop Hoists shall have the following characteristics:
   a. Motor is 208V, 3 phase, 60Hz, ¾ HP
   b. Spring set, electrically released motor mounted disk brake
   c. 500 lb working load limit
   d. Approximate travel speed 30-40 FPM
   e. Drum Diameter - 5.56 inch
   f. Control: Push button, “Hold to Run” operation with key switch on/off and hoist selection. 4 pole settable U/D/UU/UD limit switches (see drawings)
2. Roll drop hoists shall be Thern Stage Equipment RD5 Series or approved equal.

AB. Trim Chains and Dead Hang Chain and Cables:
1. Hanging chains (if used) shall be ¼” diameter minimum Grade 30 proof coil chain.
2. Wire rope may be utilized as a hanging media, provided the assembly terminates at the pipe batten with a trim chain assembly as specified below. All dead hung cables (if used) shall be 1/4” diameter, 7 x 19 construction, galvanized, small diameter utility cable, with a breaking strength of 7,000 lb.
3. Trim chains used with hanging cables shall be 36" long, ¼” diameter minimum Grade 30 proof coil chain.
4. Connection between the end link any wire rope cable shall be made with a thimble and copper oval compression (Nicopress) sleeve.

AC. Chains shall be wrapped one and one half turns around the batten and attached back to the thimble at the end of the hanging media with a standard ¼" forged shackle. Adjustment is made by connecting the shackle into a link along the return side of the chain.
1. Hoist Lift Cables:
a. All hoist lift cables shall be 3/16" diameter, 7 x 19 construction, galvanized, small diameter utility cable, with a breaking strength of 4,200 lb.
b. All manual counterweight lift cables shall be 1/4" diameter, 7 x 19 construction, galvanized, small diameter utility cable, with a breaking strength of 7,000 lb.
c. Damaged or deformed cable shall not be used. All wire rope rigging shall be installed so as to prevent abrasion of the wire rope against any part of the building construction or other equipment.

AD. Beam Clamps:
1. Beam clamps shall have two 7 gauge, painted steel plates punched to grasp a beam flange. Each plate shall have multiple holes to allow adjustment for a range of flange sizes.
2. Clamps shall be complete with two 3/8" x 1" hex bolts with lock nuts, and a 1/4" round pin anchor shackle.
3. Beam clamps shall have a recommended working load of at least 300 lbs.

AE. Cable Fittings:
1. Swaged sleeve fittings shall be copper Nicopress™. Swaged fittings shall be installed per the fitting manufacturer's instructions, using the appropriate tools, and checked with the appropriate Nicopress™ "Go - No go" gauge. Clamp type "cable clips" shall not be permitted.
2. Eyes shall be formed over galvanized wire rope thimbles of correct size.
3. Exposed cable ends shall be wrapped in high quality, "self-fusing" black silicon tape.

AF. Turnbuckles: Turnbuckles shall be drop forged and galvanized, and conform to ASTM F-1145 Type 1, Grade 1. Turnbuckles shall be moused after adjustment to prevent loosening.

AG. Pipe Battens:
1. All battens shall be 1-1/2" nominal inner diameter, Schedule 40 black iron pipe in lengths as shown on the drawings.
2. All joints shall be spliced with 18" long sleeves with 9" extending into each pipe and held by two 3/8" dia. x 2 1/4" long hex bolts and low profile jam lock nuts on each side of the joint. Welded connections are not permitted. Gaps between pipe sections shall not exceed 1/8".
3. Each end shall be covered with a bright yellow, closed end, soft vinyl safety cap at least 4 inches in length.

2.04 STAGE DRAPERY TRACKS

A. Stage Draperies Box Tracks
1. ALL TRACK AND COMPONENTS SHALL BE PROVIDED WITH BLACK FINISH.
2. Drapery tracks shall be of 14 gauge black painted galvanized steel, entirely enclosed except for slot in bottom, each half to be in one continuous piece except where splicing clamps are required. Aluminum box track is not acceptable for this project.
3. Each drapery carrier shall be spaced on 12" centers and shall be of steel construction with two nylon-tired ball-bearing wheels held to steel body by rustproof nickel plated rivet, such wheels rolling on two separate parallel treads. Each drapery carrier shall consist of a free-moving plated swivel and sufficient trim chain to accommodate drapery snap hook.
4. Live-end pulley and Dead-end pulley blocks shall be adjustable and shall be equipped with minimum 5" diameter sleeve-bearing wheels adequately guarded.

5. A rubber bumper shall be attached to each drapery carrier to function as noise reducer.
6. The manufacturer shall furnish two end stops for placement at each track end and a minimum 6” diameter tension floor pulley for increasing cord tension.
7. Provide the floor pulley with a demountable floor plate. Install floor plate flush into the stage floor as required.
8. Stretch-resistant operating cord shall be black and have a synthetic or wire center and shall be minimum 1/2" diameter.
9. Provide “Back-pack” devices for all cord operated track assemblies.
10. Track shall be rigidly supported from full pipe clamps, brackets, or other support on five-foot maximum centers.

B. Heavy Duty Aluminum Walk-Along track
1. Aluminum Walk-Along curtain tracks shall be of 7 gauge extruded aluminum I-beam construction consisting of a center rib and top, intermediate and bottom flanges.
2. ALL TRACK AND COMPONENTS SHALL BE PROVIDED WITH BLACK FINISH.
3. Each curtain carrier shall be spaced on 12” centers and shall be of steel construction to include two nylon-tired ball-bearing wheels rolling on two separate parallel treads. Each curtain carrier shall consist of a free-moving plated swivel to accommodate curtain snap hook.
4. This track system is for walk-along operation only and does not include pulleys or other operating hardware.
5. The manufacturer shall furnish four end stops for placement at track ends.
6. Provide wall brackets or other means are required for installation as shown in the drawings.

C. Pipe Batten Clamps
1. All drapery tracks shall be suspended below their respective pipe batten by rigid pipe clamps. Under no circumstances shall hanging chains or other methods be used.
2. Pipe clamp supports shall be installed at a maximum spacing of 7’-0” on center, or as required by the track manufacturer.
3. Pipe clamps shall be made of two strips of 12 Ga. by 2" hot rolled steel formed to encompass and clamp the pipe batten to prevent its rotation. Corners shall be rounded.
4. There shall be a 3/8" x 1" hex bolt with lock nut above and below the batten. A 5/8" hole in the bottom of each clamp half shall allow for the attachment of the track hangers.

2.05 STAGE DRAPERIES

A. Description and Sizes: New draperies shall be as made in accordance with the following schedule and as shown in the drawings:

Description	Qty	Width	Height	Fullness	Fabric Type	Lining
Main Valance*	1	58’-0”	8’-0”	50%	1	No
Main Curtain	2	30’-0”	16’-0”	75%	1	No
#1 Leg Panels	2	10’-0”	17’-4”	50%	2	No
#2 &3 Leg Panels	4	8’-0”	19’-0”**	Flat	2	No
#1 Border Panel	1	58’-0”	6’-8”	50%	2	No
#2 Border Panel	1	49’-0”	6’-8”	50%	2	No
#3 Border Panel	3	47’-0”	6’-8”	50%	2	No
Rear Curtain Panels	4	22’-0”	19’-0”	Flat	2	No
Cyclorama	1	40’-0”	19’-0”	Flat	1	No

* - With custom logo and trim. See drawings.

** - Provide additional fabric as required for minimum of four (4) wraps of attachment to Roll Drop hoist drum

B. Fabric types:
   1. 25 oz KM Fabrics Charisma 100% Polyester IFR Velour. Color: TBD by Architect
   2. 20 oz KM Fabrics Crescent 100% Polyester IFR Velour. Color: Black

C. Flame Retardancy: All fabrics shall be inherently flame retardant meeting the requirements of National Fire Protection Association #701.

D. Fullness: See schedule in Section 3.06.A for fullness of each drapery.
   1. Flat = no extra material.
   2. 50 - 100% = additional fabric included, exclusive of turnbacks and hems.

E. Seams: Seams between strips shall be single stitched without puckers using thread of matching color. All fabrics with a grain or pile shall have all strips running in the “up” direction.
   1. Pleats: Pleats shall be box type on 12" centers. Valances and borders (if provided with fullness) are to have their pleats arranged to conceal the seams.

F. Top Finishes:
   1. 3-1/2" jute webbing shall be double stitched to the top of the drapery with 1" of face fabric turned under the webbing. Brass rustproof #4 grommets shall be inserted in pleat centers (12" centers on flat draperies).
   2. The Main Curtain, travelers, legs, cyclorama, and any other draperies installed on tracks shall be supplied with plated CCF-2 drapery to carrier snap hooks.
   3. Draperies tied directly to pipe battens shall be supplied with 36" braided #4 cotton tie lines. Tie lines shall be black or white to best match the draperies with the centerline in alternate color to aid in hanging draperies.
   4. Orchestra Pit draperies shall be provided with hidden snap hooks

G. Bottom Hems:
   1. All velour draperies and borders shall have 6" bottom hems complete with separate interior chain pockets filled with #8 plated jack chains. Chain pockets shall be stitched so that the chain will ride 2" above the finished bottom edge of the drapery. LEAD WEIGHT TAPE SHALL NOT BE PERMITTED.
   2. Cyclorama bottom finish: In addition to the chain pocket, provide a separate, permanent 6” pocket, open at each end, and with access slits every 10’-0” to allow the insertion of 3/4” ID pipe, threaded and coupled.

H. Side Hems:
   1. The Main and Rear Curtains shall have a minimum 1/2 width of face fabric turned back at BOTH edges.
   2. All other side hems shall be a minimum of 4".
   3. Labels: Labels shall be affixed to the bottom of each piece on an offstage end identifying compliance with NFPA 701 flame retardancy requirements, piece size, manufacturer’s name, address and phone number, and date of manufacture.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Storage: The Stage Rigging and Drapery Contractor shall be responsible for storage of stage equipment, tools, and its equipment during the period of the installation.

B. Damage Protection: The Stage Rigging and Drapery Contactor shall take all precautions necessary to prevent damage to the stage floor, walls, and all other existing finishes during installation.

C. Installation Personnel:
   1. All specified equipment shall be installed by fully trained superintendents and workers.

D. Installation practices:
   1. Installation practices shall be in accordance with Federal OSHA Safety and Health Standards and all local codes. Certified welders shall perform all field welding in full compliance with the latest edition of the Structural Welding Code (ANSI/AWS D1.1) and any other applicable local and state codes and regulations.
   2. Equipment shall be installed in a workmanlike manner, per plans and specifications. Equipment shall be aligned, adjusted, and trimmed for the most efficient operation, the greatest safety and for the best visual appearance.
   3. All connection hardware utilizing rotational connections shall be “moused” (secured) with plastic electrical ties, stiff wire, or other mechanical means to prevent rotation after final adjusts are made.

E. Field Welding: All proposed field welding shall be described and submitted in detail in the form of sketches and/or drawings for review by the Architect/Engineer of Record/Engineer of Record.

F. Touch-Ups: Any welds or cuts shall be touched up to match disturbed finishes. All finishes which are disturbed during shipping and installation shall be touched up to match the original.

3.02 CLEANUP AND PROTECTION

A. Site Clean Up and Other Protection: The Stage Rigging and Drapery Contractor shall be responsible for all clean up related to its work, including the removal of packing materials etc. and the protection of existing surfaces or equipment. Repairs to damage caused by the Stage Rigging and Drapery Contractor to any item or surface are the sole responsibility of the Stage Rigging and Drapery Contractor.

B. Protection of Installed Equipment: The equipment described in this section is considered to be finished equipment and is to be protected during and after installation from excessive dirt and damage caused by other work.

C. Equipment Cleaning: All equipment and the areas around the equipment shall be cleaned prior to final inspection and acceptance.

3.03 INSPECTION, TESTING, AND OWNER TRAINING

A. Progress Inspections: During the installation of equipment the Stage Rigging and Drapery Contractor shall arrange for access as necessary for inspection of equipment by the Architect and/or the Consultant upon reasonable timely notice.

B. Special Testing: If specifications, the Architect, laws, ordinances, or any public authority require any work to be specially tested or approved, the Stage Rigging and Drapery Contractor shall give the Architect timely notice of its readiness for inspection, and of dates of inspections to be made by other authorities.

C. Final Compliance Inspection, Systems Commissioning, and Testing:
   1. Upon completing the installation of all equipment specified under this section, the Stage Rigging and Drapery Contractor shall notify the Architect, who will schedule an inspection. Contractor shall notify the Owner, Architect, and Theater Consultant of its readiness for this inspection, no less than two weeks in advance.

2. At the time of inspection, the Stage Rigging and Drapery Contractor shall furnish sufficient workers to operate all equipment and to perform such adjustments and tests as may be required by the Architect and/or their Consultants.
3. Any equipment, which fails to meet with approval, shall be repaired or replaced with suitable equipment. If determined by the Architect, the inspection may be re-scheduled and held under the same conditions as specified herein.
4. Any additional costs incurred by the Architect or their Consultants due to inspection re-scheduling because the work is incomplete or defective, or field conditions are not conducive for an full and final inspection, shall be borne by the Stage Rigging and Drapery Contractor.
5. At the time of these inspections, no other work shall be performed in the auditorium and stage areas.
6. All temporary bracing, scaffolding, etc. shall be removed to permit full operation of, and access to, all equipment.
7. Final approval will be withheld until all systems have been thoroughly tested and found to be in first class operating condition in every particular.
8. Upon completion and approval of the work, the Stage Rigging and Drapery Contactor shall remove all tools, excess supplies, and trash from the work areas. Any equipment supplied under this section, but not installed, shall be inventoried, cleaned, organized, and turned over to the Owner. The Stage Rigging and Drapery Contractor shall leave the stage and all work areas in a “broom clean” condition.

D. Owner Training And Manuals
1. Upon completion of the work, the Stage Rigging and Drapery Contractor shall submit detailed Operations and Maintenance Manuals including as-built shop drawings, equipment descriptions, any required certificates or warranties, and parts lists. Submit in quantities as required by the Architect.
2. Provide “hard” copies of Operations and Maintenance Manuals for the Owner, Architect/Engineer of Record and Consultants. The Stage Rigging and Drapery Contractor shall also provide CD-ROM’s of any and all CAD drawings or other electronically produced submittal items. Submit in quantities and file formats as required by the Architect.
3. The Stage Rigging and Drapery Contractor shall fully review all system and equipment manuals with operating and maintenance personnel designated by the Owner and/or Architect. The Contactor shall also demonstrate and fully explain the maintenance and safe use and operation of all systems and equipment included in this section. The Stage Rigging and Drapery Contractor shall notify the Owner, Architect, and Theater Consultant of the time and place of this training, no less than two weeks in advance.

END OF SECTION

SECTION 11 6153
TENSION WIRE GRID

GENERAL

1.01 SCOPE

A. Intent: This specification covers the fabrication, furnishing, delivery, provision, and installation of Tension Wire Grid system over the stage area. The form of the contract, general conditions, and the project drawings are considered to be part of these specifications.

B. General: Provide all items and work necessary for complete, safe, fully functional systems as specified, including:
   1. Tools, scaffolding, equipment, labor and supervision, even though they may not be specifically enumerated.
   2. Verification of dimensions and conditions at the job site.
   3. Coordination of the work of this section with structural steel, electrical systems, sprinkler systems, HVAC systems, roof drains, conduit, and other such systems whether under this contract or performed under a separate, prime contract.
   4. Notification to the Architect/Engineer of any conditions, measurements, quantities, or other data, as required for proper execution, fit and completion of all work, and for safe and proper operating clearances.
   5. Shipment of equipment to job site and the secured storage of all non-fixed equipment.
   6. Installation and completion, in accordance with these specifications, related drawings, the equipment manufacturer's recommendations, established trade criteria, and all applicable code requirements.
   7. Inspection, demonstration, and necessary adjustment of the completed installation by the Tension Wire Grid Contractor's installation personnel.
   8. Preparation and submission of complete record drawings and operational and maintenance data and certificates.
   9. A one year inspection by the Tension Wire Grid Contractor.

C. Definitions: For this project, the following entities are referenced:
   1. Owner: New Castle County Vocational Technical School District, Wilmington, DE
   2. Architect: ABHA Architects, Wilmington, DE
   3. Theatre Consultant: Scheu Consulting Services, Inc., Fayetteville, NY

D. Errors and Omissions: Any errors, omissions, or ambiguities found in these documents do not relieve the Tension Wire Grid Contractor of the responsibility of providing all items necessary for complete, safe, fully functional systems. Any errors, omissions, or ambiguities shall be brought to the attention of the Architect/Engineer of Record, Construction Manager, Owner, and/or Theater Consultant for clarification.

E. Work Included: The work of this section shall include, but not be limited to the following:
   1. Provide a Tension Wire Grid system as described herein and as shown in the drawings
   2. Provide all perimeter railings, access ladder landings, safety gates, and stage lighting pipes as shown on the drawings
   3. Coordinate mounting and installation of Roll Drop hoists, stage lighting raceways, stage draperies and support pipes, and other systems provided by the stage rigging and lighting contractors.

1.02 GENERAL REQUIREMENTS

A. Field Conditions: This project is the provision and installation of new Tension Wire Grid systems within an existing but renovated historic venue. All bidders shall fully inform

themselves of the conditions under which the work is to be performed. No additional compensation or time extension will be given for conditions of which bidder could have been fully aware prior to bid.

B. Safety: The systems shall conform to all applicable code requirements and shall be provided and installed in conformance to industry standards of operation and practices. All materials, arrangements, and procedures shall comply with applicable code requirements, allowing the end user to arrange and operate a safe assembly and working environment for audience and user's personnel.

C. Insurance: In the absence of more stringent requirements, the Tension Wire Grid Contractor shall maintain sufficient injury and property liability insurance coverage throughout the project's scheduled timetable, including workmen's compensation coverage for the Tension Wire Grid Contractor's employees.

1.03 TENSION WIRE GRID CONTRACTOR QUALIFICATIONS

A. All equipment and installation shall be the responsibility of a single contractor who shall own and operate a full-time, staffed shop for the fabrication and/or assembly of stage equipment. This Contractor shall assume complete responsibility for the design, fabrication, transportation, and installation of the work in this Section, and shall hold the Owner, Architect, Theater Consultant, and all their Employees and Consultants harmless for any costs for errors or omissions associated with the work of this Section and any action arising there from.

B. If the Tension Wire Grid Contractor does not manufacture or fabricate the major components of the Tension Wire Grid system themselves, then they shall be a manufacturer's authorized dealer and installer of that manufacturer's equipment.

C. The Tension Wire Grid Contractor shall have at least ten (10) years' experience in the installation of similar equipment and systems for professional and educational theaters. If requested, the Tension Wire Grid Contractor shall submit a representative list of professional theater installations.

D. The Tension Wire Grid Contractor shall be a member in good standing of the Entertainment Services and Technology Association (ESTA) and maintain qualifying membership for the duration of the project.

1.04 SUBMISSIONS

A. Drawings:
   1. Submit plans, elevations, sections, and equipment schedules to the Architect of all systems, components, installation methods, and schedules showing all information necessary to fully explain the design features, appearance, function, fabrication, load ratings, installation and use of system components in all phases of operation.
   2. The drawings shall be no less detailed than those provided in the contract documents.
   3. All drawing shall be reviewed and sealed by a State of Delaware Professional Engineer familiar with the manufacture and installation of Tension Wire Grid systems.
   4. System plans, elevations, and sections shall be submitted on minimum D-size (24x36) sheets, and shall be drawn in no less than 1/4"=1'-0" scale.
   5. Submit in a form (electronic or hard copy) and in quantities as required by the Architect,

B. Calculations: Supply calculations demonstrating compliance with performance requirements and design criteria, including analysis data. Calculations shall be signed and sealed by the qualified professional engineer licensed in the state of Delaware responsible for their preparation. At a minimum, the analysis data shall demonstrate:

1. Distribution of cable forces to the perimeter frame members based on relative stiffness of perimeter frames and wire ropes using non-linear analysis methods.
2. Analysis of wire rope conforming to ASCE 19-10 Structural Applications of Steel cables for Buildings.
3. Analysis of modular frame corner and internal connections as per AISC 360 Chapter K - Design of HSS Box Member Connections.

C. Catalog Cuts: In lieu of detailed equipment drawings, the Tension Wire Grid Contractor may submit catalog cuts for standard, unmodified equipment.
1. All catalog cuts shall contain full information on dimensions, construction, applications, load ratings, etc., to permit proper evaluation.
2. Catalog cuts shall be properly identified as to their intended use. Any options or variations shall be clearly noted.
3. Detailed drawings of any modified standard equipment shall be submitted for approval as described in Section 1.04.A.
4. Catalog cut sheets shall be prepared and bound in a professional manner, with each sheet properly indexed to a "Table of Contents". Loose or stapled sheet sets are not permitted.
5. All copies of catalog cut sheets must be clear and legible.
6. Submit in a form (electronic or hard copy) and in quantities as required by the Architect,

D. Samples
1. Samples of any or all items listed below may be requested, and shall be sent within thirty (30) days to the Owner or his representative as directed.
2. The Owner or Owner's representative reserves the right to make an examination of the samples as he may consider necessary to determine their quality and compliance with the specification, even to the destruction of the sample.
3. Samples required for submission are:
   a. Tension Wire Grid Section, 1-0" x 1-0". (300mm x 300mm)
   b. Other items as deemed necessary by owners representative.
4. In lieu of sample submission, Contractor may arrange for the Owner to visit completed work of similar scope at existing installations.
5. Samples shall be shipped to a location selected by the Owner for evaluation.

E. Approvals: All submissions must be approved per the requirements of the project's general conditions prior to the beginning any fabrication, installation, or erection. Such approval does not relieve the Tension Wire Grid Contractor of the responsibility of providing equipment in accordance with the specifications or of providing fully operational and safe systems.

1.05 WARRANTY & INSPECTIONS

A. Warranty: The Tension Wire Grid Contractor shall provide a five (5) year written guarantee against defects in materials and workmanship. Within this period, the Tension Wire Grid Contractor shall provide any required maintenance or replacement within 30 days of written notification by the Owner, except for safety related items that shall be corrected within 48 hours of notification. Subsequent to the expiration of the guarantee period, the Tension Wire Grid Contractor agrees to furnish repair and maintenance service, at the Owner's expense, within 30 days of request for such service.

B. The warranty period shall being upon final written acceptance of the systems by the Owner.

C. One Year Inspection: At one year after the date of final acceptance, and as part of this contract, the Tension Wire Grid Contractor shall provide a comprehensive inspection of all installed systems and components. Make all adjustments as may be required by normal wear and tear.

This inspection shall be scheduled directly with the Owner and shall be done at the Owner's convenience.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Quality Statement: While the equipment specifications contained herein may be based upon the standard equipment of particular approved manufacturers, the individual component specifications are provided solely to set a minimum level of quality. Under no circumstances will equipment of lesser quality be accepted for this project.

B. Proprietary Equipment and Substitutions:
   1. Whenever any product is specified by reference to the name, trade name, drawing, make or catalog number of any particular manufacturer or supplier, or by the very nature and/or detail of its specification is based on a proprietary product, the intent is not to limit competition, but to establish performance criteria and a standard of quality which has been determined as necessary for the Project.
   2. A Contractor may, at its sole option, use standard products of pre-approved manufacturers, provided the equipment, systems, and installation is approved by the Architect, Consultant and the Owner, in accordance with the submittals approval procedures outlined in the project's General Conditions.
   3. In all cases the Architect shall be the sole judge as to whether a proposed product is to be approved. The Contractor shall have the burden of proving, at its own cost and expense, to the satisfaction of the Architect, Consultant, and Owner, that the proposed product is similar and equal in performance and safety to the specified product. In making such determination, the Architect, Consultant and/or Owner may establish such objective and appearance criteria as they deem necessary that the proposed product must meet in order for it to be approved.
   4. If the proposed product requires revisions or additions to any supporting building infrastructure (i.e. structural, electrical and/or mechanical), as detailed in the Project's complete contract documents at the time of bid, the Contractor assumes all responsibility for the coordination of the proposed product with the building infrastructure, the work of other trades, and any costs of additional infrastructure as may be required to provide the substitute product.

C. Approved Equipment Manufacturers: Due to the highly specialized nature of this system and related equipment, and the safety requirements of the equipment, all fabricated and other provided components shall be manufactured, supplied, and installed by one or more of the following approved manufacturing contractors:
   1. Hall Stage, Luton, United Kingdom
   2. InterAmerica Stage, Inc.,Sanford, FL USA
   3. JR Clancy, Inc., Syracuse, NY, USA
   4. SECOA, Inc., Watonna, MN, USA

D. Other manufacturing contractors seeking acceptance must submit the following information at least 2 weeks prior to the bid opening date. Approval of contractors will be by addenda.
   1. Information showing compliance with part 2.02 "Performance Requirements".
   2. A listing of ten equivalent installations (name and address of project and owner, architect, consultant, size of project).

2.02 PERFORMANCE REQUIREMENTS

A. Tension Wire Grid shall support its self-weight plus a uniformly distributed live load of twenty (20) pounds per square foot. The allowable concentrated (point) load shall be 300 pounds

applied over a 1'-0" square area. Uniform and concentrated loads need not be assumed to act concurrently.

B. Tension wire grid's self-weight (dead load) shall not exceed 5 pounds per square foot.

C. The deflection of the wire tension walking surface under the allowable concentrated load shall not exceed 3 inches.

D. The modular frame shall provide vertical support for the walking surface and resist horizontal loads resulting from the cable tensioning and specified grid loads. No horizontal loads shall be imposed upon the building except for seismic loads and sway loads caused by the movement of personnel on the grid. Exception: If perimeter members have been provided within the building for the sole purpose of resisting horizontal loads applied from the modular frames, horizontal loads from the modular frames shall be permitted to be imposed to the perimeter members only.

E. The modular frame members of any panel shall not exceed 2 inches in depth or width. The wire rope walking surface shall be factory tensioned and connected to the modular frame. The walking surface shall be located no more than 1/4" from the top of the modular frame. The frame design shall not allow shearing or sharp bending of the wire rope walking surface to occur. Torsional forces in the frame members shall be resisted by rectangular steel tube shape.

2.03 MATERIALS

A. Structural steel shapes and plate shall be ASTM Grade A-36 or better.

B. Rectangular steel shapes shall be ASTM A500, Grade B, Fy=46 ksi. Steel pipe to be ASTM A53.

C. Wire Rope and Fittings:
   1. Wire rope shall be 1/8" diameter 7 x 19 galvanized aircraft cable.
   2. End fittings shall be pressed stainless steel ball end Model 302SS1-2 manufactured by InterAmerica Stage, Inc. or approved equal.
   3. 50% of wire rope terminations shall be proof tested to one half of the minimum cable breaking strength. Certification of this testing will be provided with as-built drawings and the O&E manuals.
   4. It shall be possible for a technician to use a standard hand swaging tool to repair any grid wire without removing any grid frame or component.

D. All bolts shall be SAE Grade 5 or better. All nuts shall be self locking or shall be installed with alternate means to prevent loosening from vibration, shrinkage, or residual stresses.

E. Suspension rods shall be fabricated from C-1010 steel and plated to ASTM-B633 with a minimum diameter of 5/8". All suspension rods shall run through a protective 1.5" schedule 40 pipe. This pipe shall also serve as support for railings, light bars, or accessories.
   1. In lieu of hangers, wall brackets may be used as deemed necessary by the tension grid manufacturer to facilitate grid coverage (backing for any wall supports will be by others).

F. Demountable lighting pipes and stanchions shall be constructed from 1.5" schedule 40 pipe.

G. Identification requirements:
   1. Each finished grid panel shall have a permanent metal tag marked to show:
      a. Name of manufacture
      b. Date of manufacture
      c. Serial Number with project ID
      d. Initials of final assembly inspector

H. Signage

1. Provide 8 x 11 fire retardant polymer informational and warning signs at each grid access location. Locate signs at eye level.
2. Signs shall include the name, address, and phone number of the manufacturing installer along with date of installation.
3. Warnings shall read as follows:

WIRE TENSION GRID
CAUTION
MAXIMUM LOAD 20 LB/SQ FT
MAXIMUM POINT LOAD 300 LB
AUTHORIZED PERSONNEL ONLY
DO NOT BOUNCE ON SURFACE
SECURE LOOSE ITEMS
MAINTAIN CABLE WEAVE AT 2" SQUARE

I. Finishes:
   1. Apply one coat (2 mils minimum) of High Performance Alkyd Metal Primer, and two coat of High Performance Protective Acrylic to all steel components except grid wires. Primer coat to be applied immediately after cleaning and pretreating. Color: flat black.
   2. Turnbuckles, clips, tracks, chains, and incidental hardware shall be plated or painted.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Storage: The Tension Wire Grid Contractor shall be responsible for storage of stage equipment, tools, and its equipment during the period of the installation.

B. Damage Protection: The Tension Wire Grid Contactor shall take all precautions necessary to prevent damage to the stage floor, walls, and all other existing finishes during installation.

C. Installation Personnel:
   1. All specified equipment shall be installed by fully trained superintendents and workers.

D. Installation practices:
   1. Installation practices shall be in accordance with Federal OSHA Safety and Health Standards and all local codes. Certified welders shall perform all field welding in full compliance with the latest edition of the Structural Welding Code (ANSI/AWS D1.1) and any other applicable local and state codes and regulations.
   2. Equipment shall be installed in a workmanlike manner, per plans and specifications. Equipment shall be aligned, adjusted, and trimmed for the most efficient operation, the greatest safety and for the best visual appearance.
   3. All connection hardware utilizing rotational connections shall be "moused" (secured) with plastic electrical ties, stiff wire, or other mechanical means to prevent rotation after final adjusts are made.

E. Field Welding: All proposed field welding shall be described and submitted in detail in the form of sketches and/or drawings for review by the Architect/Engineer of Record/Engineer of Record.

F. Touch-Ups: Any welds or cuts shall be touched up to match disturbed finishes. All finishes which are disturbed during shipping and installation shall be touched up to match the original.

3.02 CLEANUP AND PROTECTION

A. Site Clean Up and Other Protection: The Tension Wire Grid Contractor shall be responsible for all clean up related to its work, including the removal of packing materials etc. and the protection of existing surfaces or equipment. Repairs to damage caused by the Tension Wire Grid Contractor to any item or surface are the sole responsibility of the Tension Wire Grid Contractor.

B. Protection of Installed Equipment: The equipment described in this section is considered to be finished equipment and is to be protected during and after installation from excessive dirt and damage caused by other work.

C. Equipment Cleaning: All equipment and the areas around the equipment shall be cleaned prior to final inspection and acceptance.

3.03 INSPECTION, TESTING, AND OWNER TRAINING

A. Progress Inspections: During the installation of equipment the Tension Wire Grid Contractor shall arrange for access as necessary for inspection of equipment by the Architect and/or the Consultant upon reasonable timely notice.

B. Special Testing: If specifications, the Architect, laws, ordinances, or any public authority require any work to be specially tested or approved, the Tension Wire Grid Contractor shall give the Architect timely notice of its readiness for inspection, and of dates of inspections to be made by other authorities.

C. Final Compliance Inspection, Systems Commissioning, and Testing:

1. Upon completing the installation of all equipment specified under this section, the Tension Wire Grid Contractor shall notify the Architect, who will schedule an inspection. Contractor shall notify the Owner, Architect, and Theater Consultant of its readiness for this inspection, no less than two weeks in advance.
2. At the time of inspection, the Tension Wire Grid Contractor shall furnish sufficient workers to operate all equipment and to perform such adjustments and tests as may be required by the Architect and/or their Consultants.
3. Any equipment, which fails to meet with approval, shall be repaired or replaced with suitable equipment. If determined by the Architect, the inspection may be re-scheduled and held under the same conditions as specified herein.
4. Any additional costs incurred by the Architect or their Consultants due to inspection re-scheduling because the work is incomplete or defective, or field conditions are not conducive for an full and final inspection, shall be borne by the Tension Wire Grid Contractor.
5. At the time of these inspections, no other work shall be performed in the auditorium and stage areas.
6. All temporary bracing, scaffolding, etc. shall be removed to permit full operation of, and access to, all equipment.
7. Final approval will be withheld until all systems have been thoroughly tested and found to be in first class operating condition in every particular.
8. Upon completion and approval of the work, the Tension Wire Grid Contactor shall remove all tools, excess supplies, and trash from the work areas. Any equipment supplied under this section, but not installed, shall be inventoried, cleaned, organized, and turned over to the Owner. The Tension Wire Grid Contractor shall leave the stage and all work areas in a “broom clean” condition.

D. Owner Training And Manuals

1. Upon completion of the work, the Tension Wire Grid Contractor shall submit detailed Operations and Maintenance Manuals including as-built shop drawings, equipment descriptions, any required certificates or warranties, and parts lists. Submit in quantities as required by the Architect.
2. Provide "hard" copies of Operations and Maintenance Manuals for the Owner, Architect/Engineer of Record and Consultants. The Tension Wire Grid Contractor shall also provide CD-ROM's of any and all CAD drawings or other electronically produced submittal items. Submit in quantities and file formats as required by the Architect.
3. The Tension Wire Grid Contractor shall fully review all system and equipment manuals with operating and maintenance personnel designated by the Owner and/or Architect. The Contactor shall also demonstrate and fully explain the maintenance and safe use and operation of all systems and equipment included in this section. The Tension Wire Grid Contractor shall notify the Owner, Architect, and Theater Consultant of the time and place of this training, no less than two weeks in advance.

END OF SECTION

SECTION 11 6623
GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basketball backboards, goals, and support framing.

1.02 REFERENCE STANDARDS

A. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
   1. Structural steel welder certifications.
   2. Manufacturer's installation instructions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified with minimum three years of experience.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. See drawings for sizes and locations, unless noted otherwise.

B. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of contract documents.

C. Hardware: Heavy duty steel hardware, as recommended by manufacturer.

D. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.02 BASKETBALL

A. Basketball System: Backstop assembly, backboard, and goal.

B. Wall-Mounted Backstop Assemblies: Wall-mounted steel frame assembly capable of mounting both rectangular and fan-shaped backboards.
   1. Framing: Up-folding retractable framing.
   2. Framing Color: Manufacturer's standard.
   3. Products:
      a. Draper, Inc; EZ Fold Wall Mounted Stationary: www.draperinc.com.

C. Goals: Steel rim, mounted to backboard, with attached nylon anti-whip net; complete with mounting hardware.
   1. Net Attachment Device: Tube-tie.
   2. Finish: Powder coat orange.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with contract documents and manufacturer's instructions.

B. Install equipment rigid, straight, plumb, and level.

C. Secure all equipment with manufacturer's recommended anchoring devices.

D. Separate dissimilar metals to prevent electrolytic corrosion.

3.02 ADJUSTING

A. Verify proper placement of equipment.

B. Verify proper placement of equipment anchors and sleeves. Use actual movable equipment to be anchored if available.

3.03 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 12 2413
WINDOW TREATMENT – ROLLER SHADES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Manual roller shades with light filtering fabric for exterior clear glazed windows.

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 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.
   1. Provide an allowance of $5,000 for discretionary changes to window treatment trim and fascia.
      a. This allowance includes discretionary changesto window treatment trim and fascia, as directed by the Architect.
      b. This allowance shall be included as a separate line item and adjusted by material ticket costs and labor rates listed on the current State of Delaware, Department of Labor, Prevailing Wages for Building Construction table.

1.04 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.

1.05 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.

1.06 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.

1.07 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.

1.08 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. Basis of Design: MechoShade Systems, Inc.
   2. Window Treatment Fabric:
      a. 5% of ThermoVeil 1300 Series, Dense Basket Weave.
   3. Roller shade assembly:
      a. MechoShade: MechoShade/5
   4. Color: One standard color as selected by Architect from manufacturer’s standard color pallette.

5. 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.
6. Direction of Roll: Regular, from back of roller.
7. Mounting Brackets: Standard 1018 plated steel. Sizes to be compatible with window /shade size and clutch capacity. Bracket style to be compatible with mounting requirements and site conditions.
8. 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.
9. Shade Operation: Manual - with continuous loop bead chain, clutch, and cord tensioner and bracket lift operator.
10. 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.
11. Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
12. Lift Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
13. Bead Chain: Nickel-plated metal or Stainless steel.
14. Cord Tensioner Mounting: As required per installation.
15. Operating Function: Stop and hold shade at any position in ascending or descending travel.

B. Accessories:
1. Fascias: Single or double types, as required by installation. One-piece extruded aluminum.
2. Manufacturer's standard hem bar.
3. End caps.

2.03 ROLLER SHADE FABRICATION

A. 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.

B. Concealed Components: Non-corrodible or corrosion-resistant-coated materials.
1. Lifting Mechanism: With permanently lubricated moving parts.

C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
1. Shade Units installed outside (typical) : If inside mount is required, edge of shade not exceed 1/4 inch from face of jamb.
2. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.
3. Fabricate shadecloth to hang flat without buckling or distortion.

D. Installation Brackets: Shall allow for easy removal and reinstallation of shade, operating hardware and for hardware position and shade mounting method indicated.

E. 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.

F. 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. 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 following locations:
   1. All exterior windows within scope limits, except windows serving corridors, stair towers, vestibules, toilet rooms, and storage rooms.
   2. Elsewhere as noted on drawings.

END OF SECTION

SECTION 12 2424
ELECTRONIC ROLLER SHADE SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provide electrically operated, sunscreen and blackout roller shades in the auditorium. Work includes local, group and master control systems for shade operation with addressable, encoded, Electronic Drive Units (EDU).

1.02 RELATED SECTIONS:

A. Division 09 - Gypsum Veneer Plaster: Coordination for blocking, installation of shade pockets, closures and related accessories.

B. Division 26 - Electrical: Electric service for EDU's, and EDU controls, internal communication, low voltage wiring and data transfer, and connection to the Internet and required.

1.03 PRICE AND PAYMENT PROCEDURES

A. Additional Allowances: In addition to the scope of work shown, provide the following as an additional allowance.
   1. Provide an allowance for automatic solor control package for electronic roller shade system.
      a. This allowance includes purchase, delivery, and installation of an automatic solor control package for electronic roller shade system as directed by the Architect.
   2. This allowance shall be included as a separate line item and adjusted by a Unit Price.

B. Unit Prices:
   1. Unit price for providing automatic solor control package for electronic roller shade system.
      a. Unit of measure: Linear foot of automatic solor control package for electronic roller shade system installed.

1.04 SUBMITTALS

A. Product Data: 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.
   5. Typical wiring diagrams including integration of EDU controllers with building management system, audiovisual and lighting control systems as applicable.

B. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, power and control wiring diagrams, and relationship to adjacent work.
   1. Prepare shop drawings on AutoCAD format.
   2. Prepare control, wiring diagrams based on, switching and operational requirements.
   3. Include one-line diagrams, wire counts, coverage patterns, and physical dimensions of each item.
   4. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.

C. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shade

cloth samples and aluminum finish sample as selected. Mark face of material to indicate interior faces.

D. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

E. Warranty: Provide manufacturer's warranty documents as specified in this Section.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades system through one source from a single manufacturer with a minimum of ten years experience and minimum of five projects of similar scope and size in manufacturing products comparable to those specified in this section. This includes but is not limited to all required extrusions, accessories, controls and fabricated roller shades.

B. Installer Qualifications: Engage an installer, which shall assume responsibility for installation of all system components, with the following qualifications.
   1. Installer for roller shade system shall be trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

C. Fire-Test-Response Characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

D. Electrical Components: NFPA Article 100 listed and labeled by either UL or ETL or other testing agency acceptable to authorities having jurisdiction, marked for intended use, and tested as a system. Individual testing of components will not be acceptable in lieu of system testing. Where applicable, system components shall be FCC compliant.

E. PVC-Free Shadecloth: Comply with the following.
   1. Shadecloth Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, and ATCC9645.
   2. Environmental Certification: Submit written certification from the manufacturer, including third party evaluation, recycling characteristics, and perpetual use certification as specified below. Initial submittals, which do not include the Environmental Certification, below will be rejected. Materials that are simply 'PVC free' without identifying their inputs shall not qualify as meeting the intent of this specification and shall be rejected.

F. Requirements for Hardware, Controls, and Switches:
   1. Roller Shade Hardware, shade fabric, EDU, and all related controls shall be furnished and installed as a complete two-way communicating system and assembly.

G. Mock-Up: Provide a mock-up, if Architect requires, 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.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver components in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work 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. Power and control wiring shall be complete and certified, fully operational with uninterrupted communication on the lines and minimal noise certified by a commissioning agent.
   1. 485, ICON, Lonmark and Dry Contract Network: Noise on the line not to exceed shade manufacturer's limits.

1.08 WARRANTY

A. Warranty: Provide manufacturer's standard warranties, including the following:
   1. Motorized Roller Shade Hardware, and Shadecloth: Manufacturer's standard non-depreciating twenty-five year limited warranty.
   2. Roller Shade EDU's and EDU Control Systems: Manufacturer's standard non-depreciating five-year warranty.
   3. Roller Shade Installation: One year from date of Substantial Completion, including scaffolding, lifts or other means to access to the work above 12' Feet AFF.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Basis of Design: Manufacturer for Window Shade System: products by MechoSystems; 42-03 35th Street, Long Island City, NY 11101. Tel: (718) 729-2020 ext 1901; Mr. Glen Berman. Email: glenb@MechoSystems.com.

2.02 INTELLIGENT ENCODED ELECTRONIC DRIVE SYSTEM

A. Electronic Drive Unit (EDU):
   1. Intelligent Encoded EDU, and Control System: Tubular, asynchronous (non-synchronous) EDU's, with built-in reversible capacitor operating at 120VAC/60Hz, (230VAC/50Hz) single phase, temperature Class B, thermally protected, totally enclosed, maintenance free with line voltage power supply equipped with locking disconnect plug assembly furnished with each EDU.
   2. Quiet: 42 - 46 db (within 3 feet open air)
   3. Conceal EDU's inside shade roller tube.
   4. Maximum current draw for each shade EDU of 0.9Amps at 120VAC.
   5. Use EDU's rated at the same nominal speed for all shades in the same room.
   6. Use EDU's with minimum of 34RPM, that shall not vary due to load / lift capacity.
   7. Total hanging weight of shade band shall not exceed 80 percent of the rated lifting capacity of the shade EDU and tube assembly.

B. EDU System: (software, two-way communication): Specifications and design are based on the Intelligent EDU Control System, WhisperShade®IQ® System as manufactured by MechoSystems. Other systems may be acceptable providing all of the following performance capabilities are provided. EDU and control systems not in complete compliance with these performance criteria shall not be accepted as equal systems.
   1. EDU shall support two methods of control
      a. Local Dry Contact Control Inputs
         1) EDU shall be equipped with dry contact inputs to support moving the EDU/shade to the upper and lower limits.
         2) EDU shall be equipped with dry contact inputs to support moving the EDU/shade to local switch preset positions.

3) Shall support configuring the EDU under protected sequences so that a typical user would not change the EDU's setup. At a minimum the configuration should include setting limits, setting custom presets and configuring key modes of operation.

b. Network Control

1) EDU shall be equipped with a bi-directional network communication capability in order to support commanding the operation of large groups of shades over a common backbone. The network communication card shall be embedded into the tubular EDU assembly.

2. Upper and lower stopping points (operating limits) of shade bands shall be programmed into EDU's using either a hand held removable program module / configurator or a local switch.

3. Alignment Positions: Each EDU shall support a minimum of 133 repeatable and precisely aligned shade positions (including limits and presets).

a. All shades on the same switch circuit or with the same network group address with the same opening height shall align at each limit or preset (intermediate stopping position) when traveling from any position, up or down.

b. Shades of differing heights shall have capability for custom, aligned intermediate stop positions when traveling from any position, up or down.

c. Alignment of shades mechanically aligned on the same EDU shall not exceed +/- 0.125 inches (3.175mm) when commanded to the same alignment position.

d. Alignment of shades on adjacent EDU's shall not exceed +/- 0.25" inches (6.35mm) when commanded to the same alignment position.

e. Local Switch Presets: A minimum of 3 customizable preset positions shall be accessible over the local dry contact control inputs and over the network connection.

1) Upon setting the limits for the shade EDU these preset positions shall automatically default to 25%, 50% and 57% of the shade travel.

2) These positions shall be capable of being customized to any position between and including the upper and lower limits of the shade. A removable program module / configurator or local switch shall be capable of customizing the position of these presets.

f. Network Presets: A minimum of 29 customizable preset positions (including the 3 local switch presets) shall be accessible via network commands.

1) Upon setting the limits for the shade EDU these preset positions shall automatically default to the lower limit unless customized elsewhere.

2) These positions shall be capable of being customized to any position between and including the upper and lower limits of the shade. A removable program module / configurator shall be capable of customizing the position of these presets.

4. Network Control

a. The system shall have the capability of two-way digital communication with the EDU's over a common backbone.

b. Each EDU shall possess 8 addresses capable of being employed for various levels of of group control. These addresses shall be configurable via a handheld configurator and/or a PC controller. A 9th unique address shall enable the EDU(s) to be independently controlled and configured over the network via a handheld configurator and/or a PC controller.

c. Low Voltage Communication Network Implementation.

1) The low voltage network shall employ a bus topology with daisy chained network connections between nodes over a CAT5 cable (4 UTP) or over a 2 UTP cable employing at least 1 pair at 16 AWG for power and 1 pair at 22 AWG for data.
2) The low voltage network (+/- 13VDC) shall be powered by the nodes attached to it. These nodes could be line voltage powered EDU's attached to 120 VAC or 230 VAC. Alternatively, low voltage nodes shall be powered typically by a centralized low voltage power supply. If a CAT5 network cable is employed and the node draws less than 1W then the node may be powered by DC power supplied by an associated line voltage EDU.
3) Network Capacity: 4000 ft max, 250 nodes max
4) The number and size of a centralized DC supply shall vary depending upon the network requirements.

5. Operating Modes
   a. Uniform or Normal Modes of Operation:
      1) Uniform mode shall allow for shades to only move to defined intermediate stop positions to maintain maximum uniformity and organization.
      2) Normal Mode shall allow for shades to move to both intermediate stop positions, plus any position desired between the upper and lower limits as set by the installer.
6. Wall Switches:
   a. Shades shall be operated by 5-button low voltage standard switches, or programmable intelligent switches. Standard switch shall be wired to a bus interface and the bus interface will be programmed to transmit an address for the local switch.
   b. Intelligent switches may be installed anywhere on the bus line. Each IS shall be capable of storing one control level address to be broadcast along the bus line.
   c. An address that is transmitted by either a switch or central controller shall be responded to by those EDU's with the same address in their control table.
   d. IS shall provide for interface with other low voltage input devices via a set of dry contact terminals located on the switch.
   e. Standard switch or IS may control an individual, sub-group or group of EDU's in accordance with the address in each EDU.

2.03 SHADE BANDS

A. Shade Bands: Construction of shade band includes the fabric, the enclosed hem weight, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
   1. Concealed Hembar: Shall be continuous extruded aluminum for entire width of shade band and with the following characteristics:
      a. Hembar shall be heat sealed on all sides.
      b. Open ends shall not be accepted.
   2. Shade band and Shade Roller Attachment:
      a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection.
      b. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" snap-off" Spline mounting, without having to remove shade roller from shade brackets.
      c. Mounting Spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.

d. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets, does not meet the performance requirements of this specification and shall not be accepted.

2.04 ROLLER SHADE FABRICATION

A. Fabricate shade cloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided Shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design.

B. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shade bands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the Shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

C. For railroaded shade bands, provide seams in railroaded multi-width shade bands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shade bands

D. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shade bands.

E. Blackout shade bands, when used in side channels, shall have horizontally mounted, roll-formed stainless steel or tempered-steel battens not more than 3 feet (115 mm) on center extending fully into the side channels. Battens shall be concealed in an integrally colored fabric to match the inside and outside colors of the shade band, in accordance with manufacturer's published standards for spacing and requirements.
   1. Battens shall be roll formed of stainless steel or tempered steel and concave to match the contour of the roller tube.

2.05 ROLLER SHADE COMPONENTS

A. Access and Material Requirements:
   1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
   2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
   3. Use only Delran engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester shall not be accepted.

B. Motorized Shade Hardware and Shade Brackets:
   1. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel, or heavier, thicker, as required to support 150 percent of the full weight of each shade. Plastic components without use of steel angle construction do not meet the intent of this specification and shall not be accepted.

2. Provide shade hardware system that allows for field adjustment of EDU or replacement of any operable hardware component without requiring removal of brackets, regardless of mounting position (inside, or outside mount).
3. Provide shade hardware system that allows for operation of multiple shade bands offset by a maximum of 8-45 degrees from the EDU axis between shade bands (4-22.5 degrees) on each side of the radial line, by a single shade EDU (multi-banded shade, subject to manufacturer's design criteria).
4. All bands within a single EDU group shall be aligned within ¼ inch.

2.06 ROLLER SHADE SCHEDULE

A. Roller Shade Schedule: Refer to the Drawings for locations.
1. Shade Type WT-2: Motorized interior, independently operated, solar and blackout double shades in all exterior windows of rooms and spaces shown on Drawings, and related EDU control systems. WT-2 type shades shall have capability of being controlled by AV and, or lighting control system.
a. Shade pockets.
b. Fascias.
c. Room darkening side and sill channels.

2.07 SHADECLOTH

A. Visually Transparent Single-Fabric Shadecloth: MechoSystems, ThermoVeil® group, single thickness, opaque non-raveling 0.030-inch (0.762 mm) thick vinyl fabric, woven from 0.018-inch (0.457 mm) diameter extruded vinyl yarn comprising of 21 percent polyester and 79 percent reinforced vinyl, in colors selected from manufacturer's available range.
1. Dense Basket Weave: "1300 series", 5 percent open, 2 by 2 dense basket-weave pattern.
2. Color: Selected from manufacturer's standard colors.

B. Room Darkening (PVC Free) Shadecloth with Opaque Acrylic Backing: MechoSystems, "Equinox 0100 series", .008 inches thick (.19 mm) blackout material and weighing .94 lbs. per square yard, comprising of 53% fiberglass, 45% acrylic, 2% poly finish.
1. Color: Selected from manufacturer's standard colors.

2.08 ROLLER SHADE ACCESSORIES

A. Fascia:
1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
2. Fascia shall be able to be installed across two or more shade bands in one piece.
3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.

B. Room Darkening Side and Sill Channels:
1. Extruded aluminum with polybond edge seals and SnapLoc-mounting brackets and with concealed fastening. Exposed fasting is not acceptable. Channels shall accept one-piece exposed blackout hembar with vinyl seal to assure side light control and sill light control.
a. MechoSystems side channels, 1-15/16 inches (49.2 mm) wide by 1-3/16 inches (30.1 mm) deep, two-band center channels, 2-5/8 inches (66.6 mm) wide by 1-3/16 inches (30.1 mm) deep. The 2-5/8-inch (66.6 mm) double-center channels may be installed at center-support positions of multi-band-shade ElectroShades. MechoSystems side channels 2-5/8 inch (66.6 mm) may be used as center supports for ElectroShades;

shade bands up to 8 high. For shade bands over 8 feet (2438 mm), provide ElectroShade side channels.

b. ElectroShade side channels, 2-1/2 inches (63.5 mm) wide by 1-3/16 inches (30.1 mm) deep; two-band center channels 5 inches (127 mm) wide by 1-3/16 inches (30.1 mm) deep. The 2-5/8-inch (66.6 mm) double-center channels may be installed at center-support positions of multi-band-shade ElectroShades. MechoSystems side channels 2-5/8 inches (66.6 mm) may be used as center supports for ElectroShades. Also provide for use with manually operated room darkening MechoSystems's over 8 feet (2438 mm) in height.

c. Color: Selected from manufacturer's standard colors or custom color as selected by Architect.

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.

C. Turn-Key Single-Source Responsibility for Interior Roller Shades: To control the responsibility for performance of the electric roller shade system; the design, engineering, and installation of electronic drive roller shade control system, shades, addressable controls, communication interfaces, and any required sensors, switches and low voltage control wiring specified in this Section is the responsibility of the manufacturer of the shade and control system. The Architect will not produce a set of electrical drawings for the installation of control wiring for the electric roller shade control system.

1. Furnish and install shade controllers, interfaces, splitters, coupler, sensors, switches, junction boxes, mounted in the ceiling in an accessible location.
   a. Locations for all visible devices to be coordinated with Architect.
   b. Inspect all material included in this contract prior to installation.
   c. Notify manufacturer of unacceptable material prior to installation.
2. Line Voltage Wiring
   a. Furnish and install power connection between Shade control system and EDU, and shall be capable of providing single line voltage wire pull for each EDU.

D. Shade Power Wiring:

1. Furnish and install line voltage Cable from roller shade motor into line voltage side of control system.
2. Wire from power junction box to each motor on the shade network.
3. Furnish and install a disconnect plug at the end of the power wiring run to each EDU. The disconnect plug must mate with a matching disconnect plug on the motor cable. EDU cable disconnect plug must be prefabricated by the manufacturer to meet UL and ETL systems requirements.
   a. The disconnect plug must mate with a matching disconnect plug on the motor cable.
   b. EDU cable disconnect plug must be prefabricated by the manufacturer to meet UL and ETL systems requirements.

E. Intergration to Third Party Systems:
   1. Coordinate and provide for others to furnish, install or program any interfaces or wiring to integrate third party systems to the roller shade control system as specified herein. Integration to shade control network can be accomplished locally through dry contact closures, or RS-232.

3.03 INSTALLATION OF ROLLER SHADES

A. On-site superintendant shall be present for all related jobsite scheduling meetings and:
   1. Supervise the roller shade installation, and setting of intermediate stops of all shades to assure the alignment of the shade bands within a single EDU group, which shall not exceed +/- 0.125 inches (3.175mm), and to assure the alignment between EDU groups, which shall not exceed +/- 0.25” inches (6.35mm).
   2. Be responsible for field inspection on an area-by- area and floor-by-floor basis during construction to confirm proper mounting conditions per approved shop drawings.
   3. Verification of Conditions: examine the areas to receive the work and the conditions under which the work would be performed and notify CM and Owner of conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected. Commencement of installation shall constitute acceptance of substrate conditions by the installer.
   4. Provide accurate to 0.0625” inch (1.5875mm); field measurements for custom shade fabrication on the Roller Shades manufacturers input forms.

B. Install roller shades level, plumb, square, and true according to manufacturer’s written instructions, and as specified here in. Blocking for roller shades shall be installed plumb, level, and fitted to window mullion as per Architect’s design documents and in accordance with industry standard tolerances. The horizontal surface of the shade pocket shall not be out-of-level more than 0.625” (15.875mm) over 20 linear feet (6.096 meters)

C. Shades shall be located so the shade band is not closer than 2 inches (50 mm) to the interior face of the glass. Allow proper clearances for window operation hardware.

D. Adjust, align and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

E. Set Upper, Lower and up to 3 intermediate stop positions of all motorized shade bands, and assure alignment in accordance with the above requirements.

F. Certify the operation of all motorized shades and turn over each floor for preliminary acceptance.

G. Participate and cooperate with the electrical contractor, the window shade manufacturer and the Commissioning agent to verify and certify the installation is in full conformance with the specifications and is fully operational. This work to occur during the commissioning stage and is in addition to preliminary acceptance required for each floor.

H. Clean roller shade surfaces after installation, according to manufacturer’s written instructions.

I. Train Owner’s maintenance personnel to adjust, operate and maintain roller shade systems.

J. Protect installed products until completion of project.

K. Touch-up, repair or replace damaged products before Substantial Completion.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 12 3400
LAMINATE CLAD CASEWORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Fixed modular laminate clad casework and components.

1.02 RELATED SECTIONS

A. Section 06100: Blocking within walls where indicated.

B. Division 9: Base molding.

C. Section 12 3600: Countertops and backsplashes.

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 3000, 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.

B. Substitution: See Section 01600 . 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. 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 think: 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.
   1. See Article 3.06: Color Selection.

D. Edging Materials:
   1. 3mm PVC banding, machine applied and machine profiled to 1/8 inch radius.

2.03 SPECIALTY ITEMS

A. ADA Sink Base:
   1. Manufacturer's standard ADA compliant sink cabinet. See drawings for locations.

2.04 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. Stainless Steel Wire Pulls. 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.
   2. Elbow catch or chain bolt used to secure inactive door on all locked cabinets.

2.05 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.

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. Allow for 2 locked cabinets in each room, overhead and/or base (excluding teacher wardrobe)

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. 3mm PVC Edge Banding Color Selection: Match decorative laminate color selection.

END OF SECTION

SECTION 12 3553.19
WOOD LABORATORY CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood cabinets and cabinet hardware.

B. Countertops.

C. Service fittings and outlets.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.

1.03 DEFINITIONS

A. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches above finished floor, tops of cases less than 72 inches above finished floor and all members visible in open cases or behind glass doors.

B. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches above finished floor and bottoms of cabinets more than 30 inches but less than 42 inches above finished floor.

C. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches above finished floor.

1.04 REFERENCE STANDARDS

A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.

B. ASTM C1036 - Standard Specification for Flat Glass; 2011.

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2009.

E. SEFA 2.3 - Installation of Scientific Laboratory Furniture and Equipment; 2010.

F. SEFA 3 - Work Surfaces; 2010.

G. SEFA 7 - Laboratory and Hospital Fixtures; 2010.

H. SEFA 8W - Laboratory Grade Wood Casework; 2010.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

B. Service Fixtures: Coordinate location and characteristics of service connections.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Component dimensions, configurations, construction details, joint details, attachments; manufacturer's catalog literature on hardware, accessories, and service fittings, if any.

C. Shop Drawings: Casework locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, clearances required, and utility locations, if any.

D. Samples For Color Selection: Wood samples, fully finished, for color and species selection.

E. Test Reports: From independent laboratory indicating compliance with referenced chemical-resistance standards for cabinet finish and liner materials.

F. Manufacturer's Installation Instructions.

G. Maintenance Data: Manufacturer's recommendations for care and cleaning.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Laboratory Casework:
   1. Kewaunee Scientific Corp; ____: www.kewaunee.com.

2.02 WOOD LABORATORY CASEWORK

A. Wood Laboratory Casework: Solid wood and wood panel construction; each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels.
   1. Style: Lipped overlay.
   2. Construction: Provide joints doweled, glued and screwed, except drawers may be lock shoulder jointed; with interior of units smooth and flush; cabinet bottom flush with top of face frame; without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
   3. Structural Performance: In addition to the requirements of SEFA 3, SEFA 7, and SEFA 8W, components safely support the following minimum loads:
      a. Base Units: 500 lbs/linear ft across the cabinet ends.
      b. Suspended Units: 300 lbs static load.
      c. Tables: 300 lbs, minimum, on four legs.
      d. Drawers: 125 lbs, minimum.
      e. Hanging Wall Cases: 300 lbs (136 kg).
      f. Shelves: 100 lbs, minimum.
   4. Glazing: With gasket and removable stops; minimize rattling and vibration.
   5. Fixture Locations: Cut and drill counter tops, backs, and other components for service outlets and fixtures.
   6. Access Panels: Provide access panels for maintenance of utility service and mechanical and electrical components.
   7. Scribes and Fillers: Where cabinets do not fit tight to adjacent construction, provide filler panels of matching construction and finish.
   8. Finish: Factory-finish all exposed and semi-exposed surfaces with the same finish.
      a. Finish Performance: Provide finish on all surfaces having chemical resistance of Level 0 (no change) or Level 1 (slight change of gloss or slight discoloration) according to SEFA 8W and no visible effect when surface is exposed to:
         1) Hot water at temperature between 190 degrees F and 205 degrees F trickled down the test surface at 45 degree angle for 5 minutes.
         2) Constant moisture in the form of 2 by 3 by 1 inch thick cellulose sponge kept continually saturated with water and in contact with test surface for 100 hours.
      b. Preparation: Wood sanded smooth, free from dust and mill marks.

c. Stain: Single application of clean, manufacturer-recommended stain of selected color; tinted coating not acceptable.
d. Coating: Clear, superior-quality, chemical-resistant acyclic urethane; applied in accordance with manufacturer instructions, force-dried, sanded and wiped clean.
e. Coats: Multiple coats as required to achieve minimum 1.5 mil dry film thickness.
f. Appearance: Clear satin gloss; not cloudy or muddy.

B. Epoxy Resin Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating and color and pattern consistent throughout thickness; with integral or adhesively seamed components.
1. Flat Surface Thickness: 1 inch, nominal.
2. Surface Finish: Smooth, non-glare.
3. Color: Black.
4. Exposed Edge Shape: 3/16 inch radius corner.
5. Drip Edge: Drip groove 1/8 inch wide and deep, located 1/2 inch back from edge on underside of each exposed edge.
6. Back and End Splashes: Same material, same thickness; separate for field attachment.

2.03 MATERIALS

A. Wood-Based Materials:
1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.
2. Composite Wood Panels: Containing no urea-formaldehyde resin binders.

B. Exposed Solid Wood: Clear, dry, sound, plain sawn, selected for compatible grain and color, no defects.

C. Exposed Hardwood Plywood: Veneer core; HPVA HP-1 Grade AA, Type I; same species as exposed solid wood, clear, compatible grain and color, no defects. Band exposed edges with solid wood of same species as veneer.

D. Semi-Exposed Solid Wood: Dry, sound, plain sawn, no appearance defects, any species similar in color and grain to exposed portions.

E. Semi-Exposed Hardwood Plywood: Veneer core; HPVA HP-1 Grade C, Type I; plain sliced, any species similar in color and grain to exposed portions.

F. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.

G. Glass: Fully tempered float; ASTM C1036, Type 1, Quality Q3; ASTM C1048, tempered using horizontal tempering and complying with ANSI Z97.1; 4 mm thick minimum; exposed edges ground, and cut or drilled to receive hardware; clear.

H. Cabinet Hardware: Manufacturer's standard styles, exposed components stainless steel.
1. Finish of Exposed Components: No. 4 finish.
2. Shelves:
a. Shelf Standards and Rests: Vertical chrome steel standards with rubber button fitted steel rests.
b. Shelf Brackets: Vertical chrome steel standards with chrome steel arms.
3. Swinging Doors:
a. Hinges: Offset pin.
b. Catches: Magnetic.
c. Pulls: Chrome wire pulls, 4 inches wide.
4. Drawers:

a. Pulls: Chrome wire pulls, 4 inches wide.
b. Slides: Steel, full extension arms, ball bearings; capacity as recommended by manufacturer for drawer height and width.

I. Service Fittings and Fixtures:

PART 3 EXECUTION

3.01 INSTALLATION

A. Perform installation in accordance with manufacturer's instructions and with SEFA 2.3.

B. Use anchoring devices to suit conditions and substrate materials encountered.

C. Set casework items plumb and square, securely anchored to building structure.

D. Align cabinets to adjoining components, install filler panels where necessary to close gaps.

E. Replace units that are damaged, including those that have damaged finishes.

3.02 ADJUSTING

A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.03 CLEANING

A. Clean casework surfaces thoroughly.

3.04 PROTECTION

A. Do not permit finished casework to be exposed to continued construction activity.

B. Repair damage that occurs prior to Date of Substantial Completion, including finishes, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

SECTION 12 3600
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinetwork.

B. Wall-hung counters and vanity tops.

C. Sinks molded into countertops.

D. Seat surface for custom benches.

1.02 RELATED REQUIREMENTS

A. Section 06 4100 - Architectural Wood Casework.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2009.

B. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.

E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

G. PS 1 - Structural Plywood; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

G. Installation Instructions: Manufacturer's installation instructions and recommendations.

H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.

B. Installer Qualifications: Fabricator.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Solid Surfacing: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Flat Sheet Thickness: 1/2 inch, minimum.
   2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
   3. Other Components Thickness: 1/2 inch, minimum.
   4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge; use marine edge at sinks.
   5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.

2.02 MATERIALS

A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

B. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.

C. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.

D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

E. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 26 5501
STAGE LIGHTING SYSTEMS

PART 1 - GENERAL

1.01 GENERAL

A. Definitions: For this project, the following entities are referenced:
   1. Owner: New Castle County Vocational Technical School District, Wilmington, DE
   2. Architect: ABHA Architects, Wilmington, DE
   3. Theatre Consultant: Scheu Consulting Services, Inc., Fayetteville, NY

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

1.02 RELATED WORK AND REQUIREMENTS

A. Section 26 00 00

1.03 SCOPE

A. This section requires the fabrication, furnishing, delivery, installation and testing of the lighting system as indicated on the drawings and specified herein.

B. The contractor shall provide all materials, equipment, labor, tools, scaffolds, and incidentals necessary to perform the scope of work.

C. It is the intention of these specifications that the contractor provides a professional quality, complete and properly operating system in every respect and detail.

D. The installation contractor shall examine the plans in detail to familiarize him with the scope of the work. Special attention shall be paid to reviewing all project electrical drawings, floor plans, conduit risers, and the like for locations and quantities of boxes and enclosures.

E. The contractor shall assume full responsibility for a complete operating installation, in the required location, in accordance with the contract documents.

F. Coordinate fully with the Division 26 Contractor.

1.04 WORK INCLUDED

A. Without restricting volume or generality of above “Scope,” work to be performed under this section shall include, but not be limited to, the furnishing and installation of the following:
   1. Auditorium and Stage
      a. A computer controlled dimming system with approximately 69 dimmers and 24 relay circuits. The design shall incorporate one (1) front of house hoist positions (hoist by Stage Rigging Contractor), four (4) on stage lighting battens, two (2) onstage plugging boxes, and two (2) auditorium side torm pipes (booms) posistions. A certified stage lighting network with network receptacles that shall be located at each of the previously listed lighting positions.
      b. The stage lighting system consists of the stage dimmer cabinets, an auxiliary rack, network switch and patch bay, circuit distribution raceways, wire, DMX-512 computer based stage lighting console, video display, console plug-in stations, a mix of conventional, LED stage lighting fixtures, cables, accessories and spares. The system infrastructure will be network based.
      c. House Lighting Control shall consist of a backstage slider and button station, a portable control station in the control booth and entry stations located at the auditorium exits.

d. Existing side auditorium tormentor pipes shall be reused.

B. The Contractor shall examine the plans in detail to familiarize themselves with the scope of work.

C. The Contractor shall provide the required manufacturers' shop drawings.

D. The Contractor shall provide all the necessary specialty equipment for the complete lighting and dimming system installation as specified herein, and shown on the drawings.

E. The Contractor shall coordinate the system control wire conduit and device locations with the Division 26 Contractor.

F. The Contractor shall deliver to the job site, and coordinate the installation of, the specialty equipment with the Division 26 Contractor.

G. The Contractor shall provide, install and terminate all system control wires.

H. The Contractor shall provide and install all system control devices.

I. The Contractor shall uncrate, assemble, lamp, hang and aim all the stage lighting fixtures as shown on the drawings.

J. The Contractor shall provide for the system activation.

K. The Contractor shall provide the system manuals.

L. The Contractor shall provide the system warranty.

M. It is the Contractor's responsibility to ensure that the system and all of the system components, fixtures, equipment, devices, wire, terminations, field assemblies (including custom assemblies), etc pass all required inspections by the local authority having jurisdiction.

N. Procurement of all required permits.

1.05 WORK NOT INCLUDED

A. The following work, although in another section, has a significant impact on the scope of this work. The Contractor is responsible for the successful coordination of the following:
   1. System conduit.
   2. Installation and termination of Line supply.
   3. Installation and termination of Load wire.
   4. Dimmer/relay racks installation.
   5. Distribution installation.

1.06 CONTRACTOR'S QUALIFICATIONS:

A. Only qualified contractors shall be used.

B. The work of this section will be contracted to a single firm, referred to as the contractor.

C. The contractor shall be a lighting system contractor who regularly engages in the furnishing, installation and servicing of systems of similar nature, size, scope and complexity to that contemplated by this specification. The contractor shall have done so for a period of not less than five years preceding the bid date.

D. The contractor shall have maintained for the five years preceding the bid date, a suitably staffed and equipped service organization which has continuously offered maintenance and repair services for systems of the nature, size, scope and complexity to that contemplated by this specification.

E. The contractor shall have on staff a factory trained field service agent, capable of system testing, commissioning and troubleshooting systems of the nature, size, scope and complexity to that contemplated by this specification.

F. The contractor shall have on staff a qualified and competent lighting designer / engineer capable of designing systems of the nature, size, scope and complexity to that contemplated by this specification.

G. The contractor shall maintain for the duration of this contract all required business and professional licenses and insurance.

H. The contractor shall demonstrate to the satisfaction of the owner, through submittals presented in accordance with the project timetable, that the contractor meets all the above qualifications. The minimum contractor qualification submittal shall include the following:
   1. Statement of company history. Include a breakdown by percentage of gross sales of all business activities the contractor is involved in for each of the last 5 years (e.g. system installation = 30%, expendable sales = 40%, equipment rentals = 20%, design and other professional services = 10%, etc).
   2. Previous experience: Furnish a list of four installations of the type and size contemplated by these specifications, currently in use as originally installed, in which a theatre / system consultant was involved, completed in the last 5 years and the following information regarding each installations:
      a. Name and address of each installation facility.
      b. Facility owner and telephone number.
      c. Name, address, and phone number of a person regularly employed by the owner, who is familiar with the operation of the systems and who has no connection or business connections with the contractor except as the contractor shall fully disclose
      d. Name, address, and phone number of the theatre / system consultant, along with the names of all the consultant's personal directly involved.
      e. System shop drawing - These will be returned if the contractor provides a call tag or return postage.
      f. Owner's manual drawing - These will be returned if the contractor provides a call tag or return postage.
      g. System as-built drawings drawing - These will be returned if the contractor provides a call tag or return postage.
      h. List of contractors personal involved with each persons responsibility on the project.
      i. Name, address and phone number of the general contractor, along with the names of all key GC personal directly involved.
      j. Name address and phone number of the electrical contractor, along with the names of all key EC personal directly involved.
   3. Statement of current company capabilities and ownership.
   4. Key Personal: For each of the key personnel listed in the below; Include individual's name, title, and number of continuous years of service to contractor. Include a resume detailing industry experience, and role within organization (include only full-time/regular staff employees; not independent contractor, freelance, or temporary positions). List all industry certifications held, training courses attended, and continuing education credits, including dates of attendance.
      a. Project Manager
      b. Senior Technician
      c. Service Manager
      d. Factory Trained Field Service Agent. Include individual's name and title. List all factory held certifications, training courses attended, and continuing education credits, including dates of attendance. Provide a list of recently commissioned systems, scope of project, and commissioning dates.

e. Lighting Designer / Engineer. Include individual's name and title. List current design credits with scope of project, and design completion dates.
f. Other Department Staff. Include size of staff and experience of each staff member.

5. Replacement and Spare Parts Inventory - Provide detailed list of primary replacement parts, components, and spares typically held in inventory.
6. Test Equipment and Physical Plant - Include an inventory of all test facility equipment owned and used regularly by the Service Department. Provide description of physical plant and space utilization.
7. Copies of all business and professional licenses and insurance certificates.

PART 2 - PRODUCTS

2.01 GENERAL

A. When this document lists several acceptable manufacturers for a particular item of equipment, more than one of which is to be provided, the Contractor shall furnish all of those similar items of equipment from one manufacturer.

B. All ETC and Strand dimmer racks, dimmer modules, lighting controls and lighting consoles shall be from the same manufacturer

C. Any item of equipment or hardware that may not be specifically shown on the drawings or specified herein, but required for proper system operation or installation, shall be furnished and installed and be of the highest quality available.

D. All materials and equipment used in this project shall be new, unused and of the latest models and design. Refurbished materials and equipment are not permitted except where noted.

E. The performance of all equipment must meet the most recently published manufacture's data sheet.

F. UL Labels: All equipment, where applicable standards have been established, shall be listed by Underwriters' Laboratories, Inc., and shall bear UL label when delivered to the job.

G. If so required by the local authority having jurisdiction, anything not arriving at the job bearing a UL label shall be field inspected and labeled by a nationally recognized testing laboratory recognized and approved by the local authority having jurisdiction.

2.02 ACCEPTABLE MANUFACTURERS

A. The stage lighting and control manufacturer shall be one who has been continuously engaged in the manufacture of stage lighting control equipment, wiring devices, and electronic dimmers for ten years or more.

B. Except where otherwise noted in this specification, the following are the approved manufacturers for the listed respective products:

Altman Lighting Inc.
57 Alexander Street
Yonkers, NY 10701
(914) 476-7987

Electronic Theatre Controls, Inc.
3030 Laura Lane
Middleton, Wisconsin 53562
(800) 688-4116

LEX Products Corp.
401 Shippan Avenue
Stamford, CT 06902

(800) 643-4460
LynTec
8401 Melrose
Lenexa, KA 66214
(913) 529-2233
Lycian Stage Lighting
PO Box D
Kings Hwy
Sugar Loaf, NY 10981-0214
(845) 469-2285
Middle Atlantic Products, Inc.
North Corporate Drive
Riverdale, NJ 07457
(973) 839-1011
Pathway Connectivity
Acuity Brands Lighting
#103- 143917th Ave SE
Calgary AB T2G1J9, Canada
403-243-8110
Robert Juliat USA
48 Capital Dr.
Wallingford, CT 06492
(203) 294-0481
SSRC
11 Freedom Court
Greer, South Carolina 29650
(864) 848-9770
Strand Lighting, Inc.
10911 Petal St.
Dallas, TX 75238
813-334-4189
Strong Entertainment Lighting
4350 McKinley Street
Omaha, NE 68112
(402) 453-4444

C. Alternatives: In no case will equipment or materials of lesser design or workmanship be acceptable. Only those materials and equipment listed in this specification will be considered unless prior approval is sought and received.
   1. Substitutions: When a specific piece of equipment specified has been discontinued and/or replaced by a new model, substitution will be acceptable when:
      a. Submission of complete data on the new model or substitute has been approved by the owner prior to equipment acquisition.
      b. Substitute equipment or the replacement of rejected equipment shall be at the sole expense of the contractor.
   2. Substitutes shall be considered only when they are submitted fourteen days prior to bid date, and are accompanied by sufficient catalog data, specifications, and technical information for evaluation.

a. Summarize proposal with a list of equipment catalog or series numbers. Substitute bids shall include a system riser diagram detailing components and any deviation of functionality from the drawings and specifications herein.
b. The bidder shall include the name, address, and phone number of at least two- (2) factory authorized Field Warranty centers within a 250-mile radius of the job site as a part of the submittal documents.
c. On the lighting fixtures, the bidder submitting other equipment shall include performance data taken and reported in compliance with the "Recommended Practice for Reporting Photometric Performance of Incandescent Filament Lighting Units used in Theatre and Television Production," approved as the official standard by the U.S. Institute for Theatre Technology, the Illuminating Engineering Society, the Society of Motion Picture and Television Engineers, and the American Theatre Association. For purposes of establishing the validity of such submissions, the manufacturer shall furnish this data from an independent testing laboratory. Proposals that fail to meet this requirement shall not be considered.
d. On the dimming system, the bidder submitting other equipment shall include pertinent performance data, charts and drawings showing in what respect the system will function in accordance with specification, and in what way it will deviate from the specification. This submittal shall include, but not be limited to the following:
    1) Rated ampacity, peak single cycle surge current rating, I^2t rating, and transient voltage rating of the output devices employed in the dimmers.
    2) Laboratory verification of minimum current rise time at a 90-degree conductive angle, with the dimmer operating at the maximum load.
    3) Description of the air-cooling and air filtration systems.
    4) Description of the packaging and ease of replacement for all spare parts required in this specification.
    5) Original Manufacturer's catalog data sheets for all major components of the dimmer system.
e. On the control system, the bidder shall submit the name of the manufacturer, and list of ten (10) or more operating systems in the State of Pennsylvania of the type specified which meet the performance control functions designed, with contact names and telephone numbers for references. This information shall be mandatory as a basis for determining the bidder's intent in meeting the full requirements of this specification, and shall be submitted at least fourteen days in advance of bidding.
f. It is understood that any additions or revisions of wiring required by the use of substitute equipment, whether such wiring is part of this contract or of the prime electrical contract, shall be the responsibility of the bidder making the substitution.
g. If required by the Owner, the Consultant, or Architect, the bidder shall provide working samples of substitute equipment including lamps for any lighting fixtures, to be delivered to the premises designated, for examination by Architects, Consultants, and such representatives as the Owner may direct. Handling, shipping and delivery to, or removal from site, of any sample required shall be at the cost of the Contractor. The Contractor shall be responsible for the arrangement of the cost of the electrical supply required to properly test any lighting instruments or item of equipment. Proposals which fail to address specification requirements or review comments will be rejected.
h. Prior approval submittal review and approval shall not be considered to be shop drawing review. Prior approval in no way relieves the Contractor of responsibility to fully meet the requirements and intent of this specification.

i. Should the contractor propose and receive approval for the use of alternative or substitute equipment which requires additional or modified conduit, the contractor will be solely responsible for the installation of such conduit.

2.03 AUDITORIUM STAGE LIGHTING DIMMER BANKS

A. The dimmer rack shall be of modular design. The rack must be able to accept “slide in” dimmer modules and “slide in” control modules for easy installation and removal.

B. Furnish the dimmer racks and related equipment from one of the following approved manufacturers; see system one line drawing for quantities and device location drawing for placement.

1. Electronic Theatre Controls, Inc.

CAT. #	DESCRIPTION
SR3-48	Stage lighting dimmer racks. Sensor 3 dimmer rack configured for 96, 20amp circuits. Buss kit (power and control)
DRd6	House lighting dimmer rack. Unison dimmer rack configured for 12, 20amp circuits

2. Strand Lighting, Inc.

CAT. #	DESCRIPTION
76502	tage lighting dimmer rack. C-21 dimmer rack configured for 96, 20amp circuits. Buss kit (power and control)
74121 A21-3 space and 74130- A21-9 space	House lighting dimmer racks configured for 12, 20amp circuits

2.04 AUDITORIUM STAGE LIGHTING DIMMER MODULES

A. The Dimmers and Relays shall be of modular design for easy installation and removal. Each module to come equipped with two 2.4kw circuits, magnetic circuit breakers and a sealed power device assembly. The sealed power device assembly must be field replicable without soldering.

B. Furnish the dimmer modules from one of the following approved manufacturers; see system one line for quantities.

1. Electronic Theatre Controls, Inc.

CAT. #	DESCRIPTION
D20AF	Stage lighting dimmer modules. Dual 20 amp status reporting dimmer modules for production dimming circuits

R20AF	Stage lighting dimmer modules. Dual 20 amp status reporting dimmer modules for production relay circuits
D20AF	One spare
R20AF	House lighting relay modules. Dual 20 amp dimmer modules for house lighting relay circuits
R20AF	One spare
AMF	Furnish necessary quantities of Air flow modules

2. Strand Lighting Inc.

CAT. #	DESCRIPTION
76562	C21 Stage lighting dimmer modules. Dual 20 amp dimmer modules for production dimming circuits
76566	C21 Stage lighting dimmer modules. Dual 20 amp modules for production relay circuits
76562	One spare
74195	House lighting relay modules Quad 2400w dimmer modules for house light relay circuits
74171	One spare

2.05 AUDITORIUM STAGE LIGHTING CONTROL MODULES

A. The control electronics shall be of modular design. The unit must be “slide in” for easy installation and removal. The control electronics module must be field replaceable without disconnecting any control wiring

B. Furnish the dimmer control modules from one of the following approved manufacturers; see system one line for quantities.

1. Electronic Theatre Controls, Inc.

CAT. #	DESCRIPTION
CEM3	Stage lighting dimmer rack control module. Sensor 96 channel control module.
CEM3	One spare
P-ACP	Unison Paradigm Architectural Control Processor (ACP) for the control of house lighting
P-SPM	Unison Paradigm Station Power Module
P-ACP	One spare

U-RTO	Unison ride thru power option to keep processor energized for up to 10 sec in short power outages
UPBO	Battery pack option to keep the processor energized in the event of power loss or interruption to the enclosure. Battery to provide power up to 90 minutes

2. Strand Lighting Inc.

CAT. #	DESCRIPTION
76520-0004	96 way C-21 control processor assembly with architectural power supply and Ethernet switch
76522	96 way, C-21 control processor module (spare).
xxxxx	Architectural Control Processor for the control of house lighting
xxxxx	Station Power Module
xxxxx	Battery pack option to keep the processor energized in the event of power loss or interruption to the enclosure. Battery to provide power up to 90 minutes
xxxxx	Ride thru power option to keep processor energized for up to 10 sec in short power outages
79100	One spare

2.06 AUDITORIUM STAGE LIGHTING MAIN LIGHTING CONSOLE

A. Furnish the quantity of main lighting control consoles and accessories from one of the following approved manufacturers:
   1. Electronic Theatre Controls, Inc.

QTY	CAT. #	DESCRIPTION
1	Ion 1500	Ion lighting console in 1536 output configuration, include off line editor software
2		19” LCD DVI Touch Screen Monitors
1	FADW 2 x 20	Universal fader wing
1		20’ Network cable (console
1		20’ DMX cable
1		20’ Network cable (portable node)
1	i Pad Pro	For Remote Focus Unit
1	$100 i-Pad software gift card	For i-Pad lighting software, install so owner is account holder
1		Ion dust cover
2		19” monitor dust cover

1		Fader wing dust cover
1	2 kVA UPS	Uninterrupted Power Source
2	Littlite	Task lights
1		6’ extension cable
1		6 receptacle power strip

2. Strand Lighting, Inc.

QTY	CAT. #	DESCRIPTION
1	91001	NEO Lighting Control Console w/ 3 universe of DMX
2	91002	1 each additional universe of DMX
2	91021	19” LCD DVI Touch Screen Monitors
1	65100	NODE-2 SN 100 Network Node – portable
1		20’ Network cable (portable node)
1		20’ Network cable (console)
1		20’ DMX cable
1		20’ Console sub master interface cable
1		Wireless Handheld remote control unit
1	66305	Ethernet Card
1		console dust cover
1		19” monitor dust cover
1	2 kVA UPS	Uninterrupted Power Source
1		Controller mini keyboard
1		Controller mouse
2	Littlite	Task lights
2		6’ extension cable
2		6 receptacle power strip

2.07 COMPUTER

A. Furnish a Dell Laptop computer (or equal) which meets all minimum requirements for console off line software package. Include console off line software package installed on laptop computer.

2.08 AUDITORIUM STAGE LIGHTING CONTROL CONNECTION PLATES

A. The system will be accessible via interconnection plates for the lighting control console and Ethernet output receptacles located at the performance lighting positions. Furnish lighting plugging stations; see contract drawings for type, quantities and locations.

2.09 AUDITORIUM HOUSE LIGHT CONTROL

A. General Description
   1. Control shall be low-voltage type as specified here and as listed below and/or shown on the drawings. Controls shall use low-voltage Class II electrical wiring. All controls shall be able to access and control house light dimmers.
      a. Furnish and install the following equipment and accessories; see system one line for quantities and the device location drawing for placement.

b. Electronic Theatre Controls, Inc.

CAT#	DESCRIPTION
U10001-x1F	On/Off Entry stations inside keyed enclosure. Coordinate station color with architect
SL-1	Sliding Locking Cover for all On/Off entry stations
UH40712-41F-P (black	7 fader, 12 button, 4 gang pendant style Master control station for control of house lighting with pin plug
UH40712-41F (black	7 fader, 12 button, 4 gang surface mount Master control station for control of house lighting and stage lighting

2. Electronic Theatre Controls is the basis for design, acceptable manufacturers are Strand Lighting and Lightolier Controls ,Inc.

2.10 EMERGENCY DMX BYPASS KIT

A. General Description
1. Where required to trigger special-purpose lighting presets and bypass normal lighting controls during emergency or panic situations, the bypass means shall be the DMX Emergency Bypass Controller (DEBC). Electronic Theatre Controls is the basis for design alternative manufacturers are Strand Lighting Inc. or an approved equal.
2. Furnish and install the following equipment and accessories; see system one line for quantities and the device location drawing for placement.

B. Functional
1. The DMX Emergency Bypass Controller shall be capable of overriding a single universe of ANSI E1.11-2008, USITT DMX512-A control signals from “Normal” to “Bypass” when a trigger signal is detected via a two-pin trigger input.
2. The DMX Emergency Bypass Controller shall be capable of recording a single DMX preset (snapshot) of 512 channels for recall during “Bypass” mode.

C. The DMX Emergency Bypass Controller (DEBC) enclosure shall be a surface mounted enclosure constructed of 16-gauge, formed steel panels with a removable front cover.
1. Dimensions 9”H x 11”W x 2”D.
2. Enclosure located in dimmer room.

D. The DMX Emergency Bypass Controller (DEBC) shall support one Universe (512 channels) of Digital Multiplexing (DMX) in accordance with ANSI E1.11-2008, USITT DMX512-A.
1. Controllers that do not support E1.11-2008 compliant DMX communication shall not be acceptable.
2. The DMX Emergency Bypass Controller (DEBC) shall not process (pass-through) the normal DMX input
3. The DMX Emergency Bypass Controller (DEBC) shall internally switch from the normal DMX input (pass through) to the bypass DMX output using electromechanical relays when triggered.

2.11 EMERGENCY BYPASS DETECTION

A. General Description
   1. The emergency bypass detection kit monitors a normal power feed in single and three phase systems and generates a maintained contact closure upon loss of power to trigger the UL924 listed emergency bypass operation.
   2. Electronic Theatre Controls is the basis for design alternative manufacturers are Strand Lighting Inc. or an approved equal.
   3. Furnish and install the following equipment and accessories; see system one line for quantities and the device location drawing for placement.

B. The Enclosure shall be a surface mounted, constructed of 16-guage formed steel panels removable front cover finished in fine textured, scratch-resistant, powder coat paint.
   1. Dimensions are 10.5” H x 14”W x 4.2”D.
   2. Enclosure located in dimmer room.

C. Emergency Bypass Detection enclosures shall support 100 to 277 volt configurations.

D. EBDK enclosures shall be field configurable for single-phase, bi-phase, and three-phase operation without the need for additional components.

E. The Emergency Bypass Detection Kit shall be completely pre-wired by the manufacturer. The contractor shall provide input feed and control wiring.

F. All control wire connections shall be terminated via factory provided connectors.

G. The Bypass Detection Kit shall be UL and cUL Section 924 Listed for interaction with similarly listed dimming and switching panels.

2.12 EMERGENCY LIGHTING TRANSFER SYSTEM

A. General
   1. The Emergency Lighting Transfer Panel (ELTP) shall provide automatic transfer of branch circuits from normal to emergency power when normal power fails. . Electronic Theatre Controls is the basis for design alternative manufacturers are Strand Lighting Inc. or an approved equal.
   2. The ELTP shall transfer designated lighting load branch circuits from dimmers or secondary control outputs to a second power source in the event of a loss of power to the dimmer rack, a normal system failure, or activation of fire alarm.
   3. The system shall comply with ANSI / UL1008 Transfer Switch Equipment, ANSI / NFPA 110 Standard for Emergency and Standby Power Systems, and ANSI / NFPA 70 (NEC), including Article 700, 701 and 702 safety standards. Emergency transfer systems that do not comply with the below stated NEC articles and sections shall not be permitted
   4. The ELTP shall be a self-contained system for up to 24 circuits at 20 amps. The unit shall be available with either discrete emergency branch circuit feeds from an external circuit breaker panel or a single main feed (by others)

B. Transfer Switch
   1. The switch shall be a UL 1008 LISTED, electrically operated and mechanically held (maintained) transfer switch.
   2. The switch shall be positively locked and unaffected by voltage variations or momentary outages so constant contact pressure is maintained and temperature rise at the contacts is minimized.
   3. The switch shall be mechanically interlocked to ensure only one of the two possible positions, either Normal or Emergency.
   4. Each switch shall be configured as guaranteed break-before-make

5. Built-in fuses shall provide up to 65000A Short Circuit Current Rating (SCCR) on connected emergency circuits.
6. Built-in fuses class G shall be provided on each output for compliance with NEC Section 700.27 Coordination - larger upstream breakers cannot be tripped by downstream branch circuit faults.
7. Switch contacts shall withstand transfer without welding, with 180º phase displacement between Normal and Emergency power sources, both sources energized and with 80% load.
8. Transfer switch contacts shall be rated for mixed loads, including electric discharge lamps and tungsten filament lamps.
9. Transfer switches shall be rated for 6000 cycles at full tungsten load.

C. Control Circuit
1. The control circuitry shall direct the operation of the transfer switch.
2. User configurable timing delays shall be provided for power transfer between:
3. Loss of normal power and the transfer to emergency up to 10 seconds.
4. Restoration of normal power and the transfer from emergency back to normal power up to 60 seconds.
5. A normally closed dry contact closure fire alarm input shall be provided.
6. Transfer switch shall support connections for up to 5 Remote Stations which can manually switch between normal and emergency power.

D. Operation
1. Transfer to alternate supply will occur when normal supply voltage drops below 80V when used at 120V,
2. A self-supervising isolated signal input shall be provided for connection to the facility fire alarm. The ELTP shall automatically transfer the loads to the Emergency power source when the facility fire alarm is activated as part of a normally-closed loop.
3. A key-operated switch shall be provided to manually control the ELTP. All automatic functions shall override this control. Two indicator lights shall be provided to show the position of the transfer switch.
4. All automatic functions shall override remote control functions. Any combination of open or shorted wiring to remote stations shall not affect automatic functions, or disable the local switch.

2.13 DMX DISTRIBUTION & ETHERNET WIRING

A. Furnish equipment as shown on system drawing.

B. Install a certified CAT 5E network.
1. All branches will be fully tested and documented using a Certified CAT 5E tester.
2. All Components (wire, connectors, inline couplers, patch bay, patch cords, etc.) shall be fully CAT 5E compliant.

C. Install the following hardware (when quantities above those shown on the system drawing are called for, those extras shall be furnished as loose equipment);
1. DMX/RDM duel rack mount four port Gateway configured as input node
   a. ETC N34G-4M
   b. ETC is the basis for design, acceptable manufacturers are Strand Lighting and Pathport.
2. HUB-1 24 port minimum managed gigabit network switch with PoE. PoE power to be sufficient to support all devices that are connected.
   a. 3Com or similar

3. PBY-1 Network Patchbay. 24 port RJ45. Provide required number of modular outlets. Include labeling.
   a. Siemon HD5-series or similar
4. Wireless Access Point (WAP) with single point Setup.
   a. Cisco WAP 121 Wireless-N Access point or equal.
5. One (1) DMX Opto-Splitter for house lighting fixture control.
   a. Pathway DMX Repeater Pro or equal.
6. Uninterrupted Power Supply - rack mount
   a. APC Smart UPS RT2200 VA RM 120V uninterrupted power supply 120v input/120v output, extended runtime model with switched outlet groups to connect critical equipment to a switched outlet group configured to turn on immediately in the event of a power outage and to connect peripheral equipment to a group configured to shut down, after a short period, in the event of a power outage in order to conserve battery run time (or Equal)
   b. APC Smart UPS 120v external Battery pack (or equal).
7. Fifteen (15) 3' CAT 5e patch cords
   a. Black Box EVSA85-000 or similar.
8. Portable Nodes
   a. DMX portable nodes with c-clamp and safety cable to distribute DMX over Ethernet with any compatible input or output device. Supports CAN, RDM, and USITT DMX 512-A, compliant with 802.af for Power over Ethernet, flexible output patch to allow a 512 address universe to begin at any output address. Fabricated from 16 gauge cold roll steel finished in black, fine textured scratch resistant powder coat, two integrated DMX 5 pin out ports, back lit LCD display for identification. Front and rear power indicators and RJ45 receptacle for connection to the lighting network.
   b. ETC NET 3 two port gateway tour is the basis of design; alternative manufacturers are Strand Lighting and Pathport
9. One wall mount equipment rack for Auxiliary Rack 1. Furnish swing open access wall mount auxiliary rack as indicated on drawing. Furnish rack back box to electrical contractor and coordinate instillation. Provide internal power as required. Fill all unused rack spaces with blank panels.
   a. AR-1: Middle Atlantic Products DWR-24-32 with FD-24 front door.
   b. Furnish and install the following equipment in the AR-1 rack see contract drawings for location:

QTY	DESCRIPTION
1	Panel lights with dimmer
1	Uninterrupted power supply(described above)
1	Uninterrupted power supply battery pack(described above)
1	Four port Gateway / input (described above)
1	DMX splitter(described above)
1	Network hub (described above)
1	Network patch bay (described above)
1	3u locking drawer

Middle Atlantic is the basis for design; acceptable manufacturers are Hoffman, and Rittal.

2.14 AUDITORIUM STAGE LIGHTING CONNECTOR STRIPS

A. Connector strips for the over stage lighting electrics are provided as an integral part of the stage rigging hoist assembly provided by the Stage Rigging Contractor. Coordinate all requirements for circuitry. See also stage rigging drawings.

B. Where provided by the Stage Lighting Contractor (see drawings) this assembly shall be fabricated of 16-gauge, cold-rolled steel with removable covers. Terminal strips shall be supplied for feed conduit and wire extending to flush mount 2P&G female stage pin connectors for 120V dimming circuits, and flush mount yellow Twist lock L5-20 female connectors for 120V relay circuits. Strip finish shall be fine-texture, scratch resistant, black powder-coat. One steel hanging bracket shall be supplied for each 5-foot section of connector strip with a minimum of 2 brackets per strip. The terminal blocks shall be a barrier screw clamp type. Outlets shall be identified by 2" high black on white numerals on both sides of the connector strips. Wire nuts and crimped connectors are not acceptable. The entire connector strip assembly shall be UL listed and labeled. Basis of design is SSRC equal by ETC or Strand

2.15 AUDITORIUM STAGE LIGHTING PLUGGING BOXES

A. Surface Mount Outlet boxes are fabricated from 16-gauge steel with a fine-texture, scratch-resistant, powder-coat finish. Outlets are 3-pole grounding of 20A grounded flush mount 2P&G stage pin female connectors for 120V dimming circuits, 20A grounded flush mount twist lock L5-20 female connectors for 120V relay circuits. Circuits are individually indicated with ¾” white die cut adhesive labels. Boxes are equipped with grounding lugs. All faceplates to match outlet box enclosure dimensions with no sharp edges exposed. Basis of design is ETC alternative manufacturers are Strand Lighting Inc., SSRC, LEX or an approved equal.

B. Furnish the plugging boxes for performance lighting circuits; see distribution detail drawing for circuit designations and quantities and see device location drawing for locations.

2.16 BACK BOXES

A. The following back boxes are furnished by the lighting contractor for installation by the electrical contractor:
   1. ES (locking enclosure for entry stations

2.17 AUDITORIUM STAGE LIGHTING FIXTURES

A. All theatrical lighting fixtures are to include a C-clamp, a color frame, a safety cable w/spring clip, 36” 3-wire leads and 20A grounded stage pin male connector installed except where noted differently

B. All LED lighting fixtures are to include a C-clamp, a safety cable w/spring clip, a 10’ male L5-20 to instrument power cable (plug type for power input at instrument is determined by manufacturer), a 10’ power thru jumper cable and a 10’ DMX male 5 pin to female DMX 5 pin thru jumper cable.

C. Cyclorama LED lighting fixtures shall be individually adjusted as needed to produce consistent single color wash.

D. Furnish and install the following theatrical lighting fixtures in the auditorium: see fixture plot for quantities.

QTY	CAT#	DESCRIPTION

Electronic Theatre Controls, Inc. Cat. # 419 OR Strand Lighting, Inc. Cat. # Leko Lite 11520 OR Equal	Nineteen (19) degree, 115 volt 750 watt ellipsoidal reflector spotlights
Electronic Theatre Controls, Inc. Cat. # 426 OR Strand Lighting, Inc. Cat. # Leko Lite 11540 OR Equal	Twenty-six (26) degree, 115 volt 750 watt ellipsoidal reflector spotlights
Electronic Theatre Controls, Inc. Cat. # 436 OR VStrand Lighting, Inc. Cat. # Leko Lite 11540 OR Equal	Thirty-six degree (36), 115 volt 750 watt ellipsoidal reflector spotlights
Electronic Theatre Controls, Inc. Cat. # S4LEDS2LS-0 w/7060A2030-K Zoom Lens Tube Strand Lighting, Inc. Cat. # PLPF4MKII-03-1535 OR Equal	15-30 degree zoom, LED profile fixture with 60 LED color mixing, power & DMX thru connections, die cast all metal housing, access slots for steel patterns. 100VAC to 240VAC 50/60 Hz universal power unit, Neutricx power in and thru connectors, DMX 512 in & thru via 5 pin XLR connectors, 15 bit virtual dimming engine, noiseless fan free convection cooling
Electronic Theatre Controls, Inc. Cat. # S4LEDS2LS-0 Strand Lighting, Inc. Cat. # PLPF4MKII-03-19 OR Equal	Nineteen (19) degree, LED profile fixture with 60 LED color mixing, power & DMX thru connections, die cast all metal housing, access slots for steel patterns. 100VAC to 240VAC 50/60 Hz universal power unit, Neutricx power in and thru connectors, DMX 512 in & thru via 5 pin XLR connectors, 15 bit virtual dimming engine, noiseless fan free convection cooling
ETC Selador D60 Vivid is the basis of design. Acceptable manufactures are Chavuet and Strand Lighting	Led Wash Light with 60 LED color mixing, power & DMX thru connections, die cast all metal housing, Access slots for secondary lenses and standard" par accessories. Provide 45 degree secondary lens. 100VAC to 240VAC 50/60 Hz universal power unit, Neutricx power in and thru connectors. Primary field angle of 17 deg and beam angle of 8 deg, DMX 512 in & thru via 5pin XLR connectors, 15 bit virtual dimming engine, noiseless fan free convection cooling

2.18 AUDITORIUM STAGE LIGHTING LAMPS

A. Approved manufacturers for stage lamps are General Electric, Sylvania, or Ushio.

B. Furnish and install the following stage lamps for the auditorium stage lighting fixtures in the necessary quantities plus 20% for spares:
   1. HPL750/115X, for ETC ellipsoidal and Pars, or NPA Hi-Bright Fast Fit 750w 115v lamps for Strand Leko Light.
   2. Turn over ALL spares Lamps to the Owner.

PART 3 - EXECUTION

3.01 STANDARDS COMPLIANCE

A. Comply with all local building codes.

B. In the absence of specific local codes, comply with the National Electrical Code (NFPA-70) as applicable to installation and construction of stage lighting and control equipment.

C. Where not in conflict with local building codes or the National Electrical Code comply with industry standard professional practices.

D. Installation practices shall be in accordance with OSHA Safety and Health Standards.

3.02 SHOP DRAWINGS

A. Submit within thirty (30) days of the bid acceptance, for review and approval by the Owner, Architect, and Consultant:
   1. Complete shop drawings and data sheets for all items specified.
   2. Complete shop drawings for all components, assemblies, sub-assemblies, cabinets, wiring devices and hardware required to implement the work.
   3. Riser diagrams showing all quantities, types and sizes of inter-connection wires to be installed by others.
   4. Schematics of all block assemblies and sub-assemblies, including pin out identification of all low voltage cable connectors.
   5. Approval of shop drawings does not relieve the Contractor of the responsibility of providing equipment in accordance with these specifications. Any deviations from the specifications shall be "starred" and noted in 1/4" high letters. Only deviations, which upgrade the quality of the equipment, shall be considered.
   6. In addition to drawings, the Contractor may elect to submit catalog cuts for certain standard equipment items. These shall contain full information on dimensions, construction, applications, etc. to permit proper evaluation. In addition, they shall be properly identified as to their intended use and any options or variations shall be clearly noted.
   7. Samples may be requested by the Architect and shall be furnished for inspection at the Architect's office, at the Contractor's sole expense.
   8. Prior to the commencement of fabrication and delivery, the Contractor shall submit for approval, to the Architect, an outline of a proposed commencement and completion schedule of project requirements
      a. .

3.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver stage lighting equipment and controls to job site securely wrapped in containers.

B. Coordinate delivery dates with the Division 26 contractor

C. All equipment shall be stored in a clean, dry space.

D. Discrepancies in quantities or missing equipment shall be noted, in writing, and brought to the attention of the manufacturer within five days of receipt.

E. Replacement of missing or damaged equipment shall be the responsibility of the Contractor.

F. Handle equipment and controls carefully to prevent breakage, denting and scoring finish.

G. Replace and return damaged units to equipment manufacturer immediately.

H. Store in original cartons and protect from dirt, physical damage, weather, and construction traffic.

3.04 INSTALLATION

A. The Contractor shall furnish, deliver, install and terminate all system control wires.
   1. All cables shall be permanently labeled at every termination. The label shall not be hand written. Clear heat shrink shall cover the label.
   2. Service loops of not less than 6" will be present at all terminations to equipment.
   3. All pulls to be made by hand, care will be taken not to nick cable jackets, and any nicked or damaged cable will be replaced.
   4. A pull string will be left in all conduits after wire is installed.
   5. NO SPLICES WHATSOEVER IN CONDUIT!
   6. Include spare cables with all field runs. Quantity to be 10% or 1 whichever is greater unless otherwise specified.
   7. Where shielded cable is in use leave shield drain wire the same length as the circuit conductor(s), sleeve shield drain wire in green PVC tubing. Cap where the cable jacket was removed with heat shrink. Where the shield drain wire is to be lifted follow the above and fold back over cable jacket. Then cap end with heat shrink. Do not use a single piece of heat shrink for this use two smaller ones.
   8. All soldering will be clean and neat and not exhibit evidence of a " cold" joint, were necessary heat sinks will be used. Use only rosin core "electronic type” solder.
   9. Wire nuts will be not allowed.

B. The Contractor shall furnish and install all system control devices.

C. The Contractor shall hang and aim the stage fixture hanging plot.
   1. Provide the Theatre Consultant fourteen (14) days notice prior to this work being scheduled.
   2. The Theatre Consultant shall verify the aiming of the stage fixtures.
   3. The installation of all work shall be neat.

D. All boxes, equipment, etc shall be plumb and square.

E. The installation shall conform to the plans and spec.

F. The contractor shall not commence the installation of equipment and devices, other than the pulling of cable, until all areas are clean, painted and finished to a point that they are completely dust, dirt, lint, fiber and airborne particle free. The air conditioning system must be operating to its design level and be able to keep all areas with control equipment stable.

3.05 INSTALLATION COORDINATION

A. The Contractor shall specifically coordinate the placement and sizes of conduit relating to this work and shall specifically review and approve the conduit rough-in in time to advise all parties of needed changes, omissions, etc.

B. The Contractor shall report this successful coordination in writing to the Architect.

C. If any conflicts or omissions occur as a result of the Contractor’s unsuccessful coordination of the above mentioned work, it shall be the Contractor’s responsibility to correct, furnish and install any additional material that may be required.

D. The contractor shall at all times coordinate his work with the other trades to ensure smooth progress of work and satisfactory final results.

E. The Contractor shall examine areas and conditions under which stage lighting and controls are to be installed and notify the Architect in writing of conditions detrimental to proper installation and operation.

3.06 INSPECTION AND TESTING:

A. During the installation of the equipment the contractor shall arrange for access as necessary for inspection of equipment by the owner's and/or architect's representatives.

B. Provide a safe means of accessing all system components for all visits.

C. Equipment Pretesting: All racks are to be built and wired in contractors shop and tested prior to delivery to site. All other equipment is to be tested prior to delivery and installation. A written test report will be submitted to the owner.

D. Final Inspection:

1. The final inspection will confirm that the systems, as installed, meet the requirements of this spec, the contract documents, and the approved contractor's shop drawing and submittals.
2. The contractor will inform the owner in writing of the system's completion. The contractor will then request final inspection by the consultant, and carry out the necessary coordination. This coordination includes:
   a. Giving at least fourteen days notice to the consultant prior to the final inspection.
   b. Arranging for the contractor's and consultants exclusive use of the space.
   c. Arranging for a HVAC technician to be available to turn the AC system on and off as required.
   d. Arranging for a sound technician to be available to control the sound system as required.
   e. The contractor's job foreman and one additional worker familiar with the job will be present during all check out, testing and inspection.
3. Contractor will complete the following tasks prior to consultant's arrival:
   a. Unpack and assemble all portable equipment.
      1) Place all portable equipment in one location.
      2) If anything has been turned over to the owner have the signed Letters of Transmittal on site.
      3) Complete all required paperwork (pre-testing reports, letters indicating successful coordination of the installation, etc.).
      4) Provide all lighting network certification reports.
      5) Remove all security covers.
      6) Contractor will provide all necessary software, cables, and interfaces to facilitate the setting of computer controlled, remote controlled or digitally controlled equipment.
4. Contractor will provide the following test equipment for use during inspection and acceptance testing:
   a. Some type of light meter
   b. Some type of DMX checking device
   c. Some type of Multi-meter.
   d. Contractor will provide safe means to access all system components during the entire commissioning process.

e. Contractor shall provide personal and equipment to make any adjustments to the theatrical lighting system(s), as well as to correct problems, for the entire inspection and testing period.

E. The Theatre Consultant or his representative will conduct all final system tests in order to determine final acceptance.

F. In no event shall the theatrical lighting systems installation be submitted for final approval or acceptance until any and all elements of the facility that may have a bearing on the system performance, including but not limited to doors, windows, HVAC, carpeting, furniture, wall coverings, stage flooring, rigging systems, interior design elements, architectural lighting and lighting control systems have been completed and are operable. All elements that may affect stage lighting systems operation or performance shall be "on" and operating during adjustments. The stage lighting contractor will be responsible for coordinating the requirements of this paragraph with other work on the project.

G. Equipment Backorders. Should any component or equipment be on backorder at time of system inspection and testing the contractor shall provide comparable loaner equipment at contractor's expense. Said equipment shall remain on-site until backordered equipment is delivered and installed.

3.07 MANUFACTURER'S SERVICES

A. The Contractor shall provide for:
1. A manufacturer's field service engineer to perform initial system activation. Under no circumstances shall power be applied to any equipment prior to initial system activation.
2. The manufacturer's field service engineer shall inspect and confirm that all low voltage terminations are correct.
3. Such engineering services shall be furnished within twenty-one (21) days of a written request by The Contractor.

3.08 TRAINING AND INSTRUCTION

A. The Contractor shall furnish sixteen (16) hours of on site instruction to Owner designated persons. This instruction shall happen on four occasions. The general conditions may require all training sessions to be videotaped. This contractor is to coordinate with this requirement and if required perform the taping.
1. The first occasion shall take place at the time of initial system activation and be performed by the manufacturer's field service engineer. The duration of this occasion shall be not less than three (3) hours. This instruction shall cover all aspects of operation and maintenance required by this system.
2. All other occasions shall be coordinated with the owner representative and Contractor with (21) days written notice. This instruction shall be an overall review of the system operation and detailed console operations. The finial occasion shall take place within the first six months following system activation.

B. Provide operational assistance for the first usage of the system. This is to be on the owner's time schedule but, not to exceed 8 hours.

3.09 MANUALS

A. Upon completion of the work, the Theater Equipment Contractor shall submit four detailed printed copies of Operations and Maintenance Manuals for each space, 2 for the Owner, and 1 for the Architect/Engineer of Record and one for Consultants. The Contractor shall also provide CD-ROM's with the Operations and Maintenance Manuals in PDF form with a hyper link table of contents, also any and all CAD drawings including as-built shop drawings,

equipment descriptions, any required certificates or warranties, and parts lists or other electronically produced submittal items. The contractor shall also provide a USB flash drive for each space with all project documents including the initial configuration files for the control electronics modules for the stage lighting dimmers and house light dimmers, the stage lighting consoles, the stage lighting network switches, the portable network nodes and all multi parameter stage lighting fixtures. Submit in quantities and file formats as required by the Architect

B. Additionally, inside the primary dimmer or auxiliary control rack, provide a document pouch and one set of final as-built drawings. Before distribution of manuals submit one copy to consultant for approval. Each manual is to contain the following:
   1. System one line drawings including all labeling and changes (“as builts “).
   2. Owner’s manual for each piece of equipment.
   3. Schematic diagram for each piece of equipment.
   4. Contractors service phone number in a conspicuous place.
   5. All test reports.

3.10 WARRANTIES

A. Contractor will warrant the system to be free from defects in materials and workmanship for a period of one year from the date of acceptance, or first beneficial use, which ever comes first. Acts of god and owner abuse or neglect are not covered.

B. During the warranty period the contractor will respond to and correct any call for service within one day of the call.

C. Loaner equipment will be provided if necessary.

D. The manufacturer of the stage lighting and control equipment shall warranty the electrical distribution, dimming and control equipment to be free from defects of material or workmanship for a period of two years from the date of acceptance.

E. The manufacturer shall warranty all fixtures and accessories (except lamps) to be free from defects of material or workmanship for a period of one year from the date of acceptance. During the period of this warranty, equipment that proves to be defective shall be repaired or replaced at no charge (excluding freight). Unauthorized local repairs of equipment during the warranty period shall relieve the manufacturer of his responsibilities under this warranty.

F. Include the name, address, and phone number of at least two (2) factory authorized Field Warranty centers within a 250-mile radius of the job site in the operation and maintenance manual.

3.11 FINAL ACCEPTANCE

A. The following conditions must be met before final acceptance will be granted:

B. Inventory of all equipment by the project Architects or his representative.

C. All inventoried portable equipment is in secure storage, accessible only by the Owner.

D. Approval of final tests and inspections by the project Architects, Theatre Consultant, and Owner.

E. Submittal to the Architect of three (3) signed copies of the warranty (ies).

F. Satisfactory completion of all punch list items.

G. At the date of system activation, the Contractor shall furnish and replace all lamps in stage lighting fixtures, which are observed to be noticeably dimmed, as judged by the Architect or his representative.

END OF SECTION