Delmarva Christian School

Georgetown, Delaware

APRIL 2025

ARCHITECT

BGW
2327 GRANT AVE.
OGDEN, UTAH 84401
800-552-7137

CONSTRUCTION MANAGER

RICHARD Y. JOHNSON & SON, INC.
18404 JOHNSON ROAD
P.O. BOX 105
LINCOLN, DELAWARE
302-422-3732

Title Page/Consultants Directory

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Ogden, UT 84401
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Civil Engineer
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Construction Manager
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SECTION 001113 – ADVERTISEMENT FOR BID

Public notice is hereby given that sealed bids will be received by the **Delmarva Christian School, Main Office, located at 21777 Sussex Pines Road, Georgetown, Delaware 19947 until 4:00pm local time on Wednesday, May 14th, 2025**, at which time they will be privately opened. Bidder bears the risk of late delivery.

Project involves major additions to the existing school totaling approximately 75,000 sf. This is a construction management project. Bids are to be for the following contracts:

A-1: Site Work
A-2: Concrete Work
A-3: Masonry Work
A-4: Steel Work
A-5: Carpentry & General Work
A-6: Roofing Work
A-7: Furnish Hollow Metal/Doors/Hardware
A-8 Aluminum Storefront/Windows/Glass & Glazing
A-9 Drywall/Metal Studs
A-10 Acoustical Work
A-11 Floor Covering Work
A-12 Caulking/Painting
A-13 Casework
A-14 Kitchen Equipment
A-15 Mechanical
A-15A Plumbing
A-15B HVAC
A-16 Sprinkler System
A-17 Electrical
A-18 Wall panels

Attention is called to construction schedule as detailed in the Bid Documents.

This is not a wage rated project.

A **NON-MANDATORY** Pre-Bid Meeting will be held on April 17, 2025, at 2:00pm at **Delmarva Christian School** for the purpose of reviewing bidding requirements, observing existing conditions, and to answer questions. **ATTENDANCE OF THIS MEETING IS NOT A PREREQUISITE FOR BIDDING ON THIS CONTRACT.**

Sealed bids shall be addressed to Delmarva Christian School, Attn: Justin Savini. The outer envelope should clearly indicate: **Delmarva Christian School, Company Name, Contract you are bidding, SEALED BID - DO NOT OPEN."**

Construction documents will be available for review at the following locations: Richard Y Johnson & Son Inc., and Delaware Contractors Association. Contract documents may be purchased at DiCarlo Printers, located at 2006 Northwood Drive, Salisbury MD, 21801 or RCI Printing and Graphics located at 298 Churchmans Road, New Castle DE, 19720. Electronic documents will be available on Richard Y. Johnson & Son, Inc's website www.ryjson.com under plan room. It is the responsibility of each bidder to review and coordinate all project documents. This includes plans, specifications and addendums. All documents will be available on the day of the pre-bid meeting.

Questions should be directed to the Construction Manager, Richard Y. Johnson & Son, Inc. in writing only. The fax number is (302) 422-4696. Email questions to Attn: Tony Vassalotti (tvassalotti@ryjson.com).

Minority Business Enterprises (MBE), Disadvantaged Business Enterprises (DBE) and Women-Owned Business Enterprises (WBE) will be afforded full opportunity to submit bids on this contract and will not be subject to discrimination on the basis of race, color, national origin or sex in consideration of this award. The successful bidder must post a performance bond and payment bond in a sum equal to 100 percent of the contract price upon execution of the contract. The Owner reserves the right to reject any or all bids and to waive any informalities therein. The Owner may extend the time and place for the opening of the bids from that described in the advertisement, with not less than two calendar days notice by certified delivery, facsimile machine or other electronic means to those bidders receiving plans.

INSTRUCTIONS TO BIDDERS

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ARTICLE 1: GENERAL

1.1 DEFINITIONS

1.1.1 Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

1.2 STATE: The State of Delaware.

1.3 AGENCY: Construction Manager.

1.4 DESIGNATED OFFICIAL: The agent authorized to act for the Agency.

1.5 BIDDING DOCUMENTS: 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, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Construction Manager and Prime Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

1.6 CONTRACT DOCUMENTS: The Contract Documents consist of the, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the form of agreement between the Construction Manager and Prime Contractor, Drawings (if any), Specifications (Project Manual), and all addenda.

1.7 AGREEMENT: The form of the Agreement shall be AIA Document A101, Standard Form of Agreement between Construction Manager and Prime Contractor where the basis of payment is a STIPULATED SUM. In the case of conflict between the instructions contained therein and the General Requirements herein, these General Requirements shall prevail.

1.8 GENERAL REQUIREMENTS (or CONDITIONS): General Requirements (or conditions) are instructions pertaining to the Bidding Documents and to contracts in general. They contain, in summary, requirements of laws of the State; policies of the Agency and instructions to bidders.

1.9 SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the bidding documents and to the contract under consideration and are supplemental to the General Requirements. Should the Special Provisions conflict with the General Requirements, the Special Provisions shall prevail.

1.10 ADDENDA: Written or graphic instruments issued by the Construction Manager/Architect prior to the execution of the contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

1.11 BIDDER OR VENDOR: A person or entity who formally submits a Bid for the material or Work contemplated, acting directly or through a duly authorized representative who meets the requirements set forth in the Bidding Documents.

1.12 SUB-BIDDER: A person or entity who submits a Bid to a Bidder for materials or labor, or both for a portion of the Work.

1.13 BID: A complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

1.14 BASE BID: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids (if any are required to be stated in the bid).

1.15 ALTERNATE BID (or ALTERNATE): An amount stated in the Bid, where applicable, to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents is accepted.

1.16 UNIT PRICE: An amount stated in the Bid, where applicable, as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

1.17 SURETY: The corporate body which is bound with and for the Contract, or which is liable, and which engages to be responsible for the Contractor's payments of all debts pertaining to and for his acceptable performance of the Work for which he has contracted.

1.18 BIDDER'S DEPOSIT: The security designated in the Bid to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Construction Manager if the Work to be performed or the material or equipment to be furnished is awarded to him.

1.19 CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.

1.20 CONTRACTOR: Any individual, firm or corporation with whom a contract is made by the Agency.

1.21 SUBCONTRACTOR: An individual, partnership or corporation which has a direct contract with a contractor to furnish labor and materials at the job site, or to perform construction labor and furnish material in connection with such labor at the job site.

1.22 CONTRACT BOND: The approved form of security furnished by the contractor and his surety as a guaranty of good faith on the part of the contractor to execute the work in accordance with the terms of the contract.

ARTICLE 2: BIDDER'S REPRESENTATIONS

2.1 PRE-BID MEETING

2.1.1 A pre-bid meeting for this project will be held at the time and place designated. Attendance at this meeting is a not a pre-requisite for submitting a Bid, unless this requirement is specifically waived elsewhere in the Bid Documents.

2.2 By submitting a Bid, the Bidder represents that:

2.2.1 The Bidder has read and understands the Bidding Documents and that the Bid is made in accordance therewith.

2.2.2 The Bidder has visited the site, become familiar with existing conditions under which the Work is to be performed, and has correlated the Bidder’s his personal observations with the requirements of the proposed Contract Documents.

2.2.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

2.3 JOINT VENTURE REQUIREMENTS

2.3.1 Each Joint Venturer shall be qualified and capable to complete the Work with their own forces.

2.3.2 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 Venturers involved.

2.3.3 All required Bid Bonds, Performance Bonds, Material and Labor Payment Bonds must be executed by both Joint Venturers and be placed in both of their names.

2.3.4 All required insurance certificates shall name both Joint Venturers.

2.3.5 Both Joint Venturers shall sign the Bid Form and shall submit a valid Delaware Business License Number with their Bid or shall state that the process of application for a Delaware Business License has been initiated.

2.3.6 Both Joint Venturers shall include their Federal E.I. Number with the Bid.

2.3.7 In the event of a mandatory Pre-bid Meeting, each Joint Venturer shall have a representative in attendance.

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

2.4 ASSIGNMENT OF ANTITRUST CLAIMS

2.4.1 As consideration for the award and execution by the Owner of this contract, the Contractor hereby grants, conveys, sells, assigns and transfers to the State of Delaware all of its right, title and interests in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the Owner pursuant to this contract.

ARTICLE 3: BIDDING DOCUMENTS

3.1 COPIES OF BID DOCUMENTS

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the Architectural/Engineering firm designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein.

3.1.2 Bidders shall use complete sets of Bidding Documents for preparation of Bids. The Construction Manager nor the Architect assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 Any errors, inconsistencies or omissions discovered shall be reported to the Architect immediately.

3.1.4 The Construction Manager and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall report any errors, inconsistencies, or ambiguities discovered to the Architect.

3.2.2 Bidders or Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect at least seven days prior to the date for receipt of Bids. Interpretations, corrections and changes to the Bidding Documents will be made by written Addendum. Interpretations, corrections, or changes to the Bidding Documents made in any other manner shall not be binding.

3.2.3 The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specification compliance will be the responsibility of the Bidder.

3.2.4 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all permits, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

3.2.5 The Owner will bear the costs for all impact and user fees associated with the project.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certifies that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Bidder's responsibility to assure that the proposed substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

3.3.2 Requests for substitutions shall be made in writing to the Architect at least ten days prior to the date of the Bid Opening. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due the substitution, and any other information necessary for an evaluation. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval shall be final. The Architect is to notify Owner prior to any approvals.

3.3.3 If the Architect approves a substitution prior to the receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding.

3.3.4 The Architect shall have no obligation to consider any substitutions after the Contract award.

3.4 ADDENDA

3.4.1 Addenda will be mailed or delivered to all who are known by the Architect to have received a complete set of the Bidding Documents.

3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 No Addenda will be issued later than 4 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.

3.4.4 Each bidder shall ascertain prior to submitting his Bid that they have received all Addenda issued, and shall acknowledge their receipt in their Bid in the appropriate space. Not acknowledging an issued Addenda could be grounds for determining a bid to be non-responsive.

ARTICLE 4: BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

4.1.1 Submit the bids on the Bid Forms included with the Bidding Documents.

4.1.2 Submit the original Bid Form for each bid. Bid Forms may be removed from the project manual for this purpose.

4.1.3 Execute all blanks on the Bid Form in a non-erasable medium (typewriter or manually in ink).

4.1.4 Where so indicated by the makeup on the Bid Form, express sums in both words and figures, in case of discrepancy between the two, the written amount shall govern.

4.1.5 Interlineations, alterations or erasures must be initialed by the signer of the Bid.

4.1.6 BID ALL REQUESTED ALTERNATES AND UNIT PRICES, IF ANY. If there is no change in the Base Bid for an Alternate, enter “No Change”. The Contractor is responsible for verifying that they have received all addenda issued during the bidding period. Work required by Addenda shall automatically become part of the Contract.

4.1.7 Make no additional stipulations on the Bid Form and do not qualify the Bid in any other manner.

4.1.8 Each copy of the Bid shall include the legal name of the Bidder and a statement whether the Bidder is a sole proprietor, a partnership, a corporation, or any legal entity, and each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current Power of Attorney attached, certifying agent's authority to bind the Bidder.

4.2 BID SECURITY

4.2.1 All bids shall be accompanied by a deposit of either a good and sufficient bond to the agency for the benefit of the agency, with corporate surety authorized to do business in this State, the form of the bond and the surety to be approved by the agency, or a security of the bidder assigned to the agency, for a sum equal to at least 10% of the bid plus all add alternates, or in lieu of the bid bond a security deposit in the form of a certified check, bank treasurer’s check, cashier’s check, money order, or other prior approved secured deposit assigned to the Construction Manager. The bid bond need not be for a specific sum, but may be stated

to be for a sum equal to 10% of the bid plus all add alternates to which it relates and not to exceed a certain stated sum, if said sum is equal to at least 10% of the bid. The Bid Bond form used shall be the attached form in the construction documents.

4.2.2 The Construction Manager has the right to retain the bid security of Bidders to whom an award is being considered until either a formal contract has been executed and bonds have been furnished or the specified time has elapsed so the Bids may be withdrawn or all Bids have been rejected.

4.2.3 In the event of any successful Bidder refusing or neglecting to execute a formal contract and bond within 20 days of the awarding of the contract, the bid bond or security deposited by the successful bidder shall be forfeited.

4.3 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

4.3.1 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 solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex or national origin."

4.4 SUBMISSION OF BIDS

4.4.1 Enclose the Bid, the Bid Security, and any other documents required to be submitted with the Bid in a sealed opaque envelope. Address the envelope to the party receiving the Bids. Identify with the project name, project number, and the Bidder's name and address. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof. The Construction Manager is not responsible for the opening of bids prior to bid opening date and time that are not properly marked.

4.4.2 Deposit Bids at the designated location prior to the time and date for receipt of bids indicated in the Advertisement for Bids. Bids received after the time and date for receipt of bids will be marked “LATE BID” and returned.

4.4.3 Bidder assumes full responsibility for timely delivery at location designated for receipt of bids.

4.4.4 Oral, telephonic or telegraphic bids are invalid and will not receive consideration.

4.4.5 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are then fully in compliance with these Instructions to Bidders.

4.5 MODIFICATION OR WITHDRAW OF BIDS

4.5.1 Prior to the closing date for receipt of Bids, a Bidder may withdraw a Bid by personal request and by showing proper identification to the Architect. A request for withdraw by letter or fax, if the Architect is notified in writing prior to receipt of fax, is acceptable. A fax directing a modification in the bid price will render the Bid informal, causing it to be ineligible for consideration of award. Telephone directives for modification of the bid price shall not be permitted and will have no bearing on the submitted proposal in any manner.

4.5.2 Bidders submitting Bids that are late shall be notified as soon as practicable and the bid shall be returned.

4.5.3 A Bid may not be modified, withdrawn or canceled by the Bidder during a thirty (30) day period following the time and date designated for the receipt and opening of Bids, and Bidder so agrees in submitting their Bid. Bids shall be binding for 30 days after the date of the Bid opening.

ARTICLE 5: CONSIDERATION OF BIDS

5.1 OPENING/REJECTION OF BIDS

5.1.1 Private Bid Opening.

5.1.2 The Construction Manager shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid Security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

5.1.3 If the Bids are rejected, it will be done within thirty (30) calendar day of the Bid opening.

5.2 COMPARISON OF BIDS

5.2.1 After the Bids have been opened and read, the bid prices will be compared and the result of such comparisons will be made available to the public. Comparisons of the Bids may be based on the Base Bid plus desired Alternates. The Construction Manager shall have the right to accept Alternates in any order or combination.

5.2.2 The Construction Manager reserves the right to waive technicalities, to reject any or all Bids, or any portion thereof, to advertise for new Bids, to proceed to do the Work otherwise, or to abandon the Work, if in the judgment of the Agency or its agent(s), it is in the best interest of the State.

5.2.3 An increase or decrease in the quantity for any item is not sufficient grounds for an increase or decrease in the Unit Price.

5.2.4 The prices quoted are to be those for which the material will be furnished F.O.B. Job Site and include all charges that may be imposed during the period of the Contract.

5.2.5 No qualifying letter or statements in or attached to the Bid, or separate discounts will be considered in determining the low Bid except as may be otherwise herein noted. Cash or separate discounts should be computed and incorporated into Unit Bid Price(s).

5.3 DISQUALIFICATION OF BIDDERS

5.3.1 An Construction Manager shall determine that each Bidder is responsible before awarding the Contract. Factors to be considered in determining the responsibility of a Bidder include:

A. The Bidder's financial, physical, personnel or other resources including Subcontracts;

B. The Bidder's record of performance on past public or private construction projects, including, but not limited to, defaults and/or final adjudication or admission of violations of the Prevailing Wage Laws in Delaware or any other state;

C. The Bidder's written safety plan;

D. Whether the Bidder is qualified legally to contract with the State;

E. Whether the Bidder supplied all necessary information concerning its responsibility; and,

F. Any other specific criteria for a particular procurement, which an agency may establish; provided however, that, the criteria be set forth in the Invitation to Bid and is otherwise in conformity with State and/or Federal law.

5.3.2 If an agency determines that a Bidder is nonresponsive and/or nonresponsible, the determination shall be in writing and set forth the basis for the determination. A copy of the determination shall be sent to the affected Bidder within five (5) working days of said determination.

5.3.3 In addition, any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of their Bid or Bids.

5.3.3.1 More than one Bid for the same Contract from an individual, firm or corporation under the same or different names.

5.3.3.2 Evidence of collusion among Bidders.

5.3.3.3 Unsatisfactory performance record as evidenced by past experience.

5.3.3.4 If the Unit Prices are obviously unbalanced either in excess or below reasonable cost analysis values.

5.3.3.5 If there are any unauthorized additions, interlineation, conditional or alternate bids or irregularities of any kind which may tend to make the Bid incomplete, indefinite or ambiguous as to its meaning.

5.3.3.6 If the Bid is not accompanied by the required Bid Security and other data required by the Bidding Documents.

5.3.3.7 If any exceptions or qualifications of the Bid are noted on the Bid Form.

5.4 ACCEPTANCE OF BID AND AWARD OF CONTRACT

5.4.1 A formal Contract shall be executed with the successful Bidder within twenty (20) calendar days after the award of the Contract.

5.4.2 The Construction Manager shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid, plus accepted Alternates.

5.4.3 The successful Bidder shall execute a formal contract, submit the required Insurance Certificate, and furnish good and sufficient bonds, unless specifically waived in the General Requirements, in accordance with the General Requirement, within twenty (20) days of official notice of contract award. Bonds shall be for the benefit of the Agency with surety in the amount of 100% of the total contract award. Said Bonds shall be conditioned upon the faithful performance of the contract. Bonds shall remain in affect for period of one year after the date of substantial completion.

5.4.4 If the successful Bidder fails to execute the required Contract and Bond, as aforesaid, within twenty (20) calendar days after the date of official Notice of the Award of the Contract, their Bid guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a forfeiture or as a penalty. Award will then be made to the next lowest qualified Bidder of the Work or readvertised, as the Agency may decide.

5.4.5 Prior to receiving an award, the successful Bidder shall furnish to the Construction Manager proof of State of Delaware Business Licensure. If the Bidder does not currently have a Business License, they may obtain an application by writing to: Division of Revenue, Carvel State Office Building, 820 French Street, Wilmington, DE 19899. A copy of the letter written to the Division of Revenue, sent with your Bid will be adequate proof for your firm to be considered for award until such time as you receive your license.

5.4.6 The Bid Security shall be returned to the successful Bidder upon the execution of the formal contract. The Bid Securities of unsuccessful bidders shall be returned within thirty (30) calendar days after the opening of the Bids.

ARTICLE 6: POST-BID INFORMATION

6.1 CONTRACTOR'S QUALIFICATION STATEMENT

6.1.1 Bidders to whom award of a Contract is under consideration shall, if requested by the Construction Manager, submit a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a statement has been previously required and submitted.

6.2 BUSINESS DESIGNATION FORM

6.2.1 Successful bidder shall be required to accurately complete an Office of Management and Budget Business Designation Form for Subcontractors.

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

7.1 BOND REQUIREMENTS

7.1.1 The cost of furnishing the required Bonds, that are stipulated in the Bidding Documents, shall be included in the Bid.

7.1.2 If the Bidder is required by the Construction Manager to secure a bond from other than the Bidder's usual sources, changes in cost will be adjusted as provide in the Contract Documents.

7.1.3 The Performance and Payment Bond forms used shall be the standard forms (attached).

7.2 TIME OF DELIVERY AND FORM OF BONDS

7.2.1 The bonds shall be dated on or after the date of the Contract.

7.2.2 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix a certified and current copy of the power of attorney.

ARTICLE 8: FORM OF AGREEMENT BETWEEN AGENCY AND CONTRACTOR

8.1 Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A401-2007, Standard Form of Agreement Between Construction Manager and Prime Contractor Where the Basis of Payment is a Stipulated Sum.

END OF INSTRUCTIONS TO BIDDERS

Delmarva Christian School
21777 Sussex Pines Rd. Georgetown, Delaware
Project No. DMCHS22001

BID FORM

For Bids Due: May 14, 2025 **To:** Delmarva Christian School

Contracts

Clearly Mark Contract you are bidding (Only 1 contract per bid form)

For Bid Package A:

___ **Contract #1**	**Site Work**	___ **Contract #10**	**Acoustical Work**
___ **Contract #2**	**Concrete Work**	___ **Contract #11**	**Floor Covering Work**
___ **Contract #3**	**Masonry Work**	___ **Contract #12**	**Caulking/Painting**
___ **Contract #4**	**Steel Work**	___ **Contract #13**	**Casework**
___ **Contract #5**	**Carpentry & General Work**	___ **Contract #14**	**Kitchen Equipment**
___ **Contract #6**	**Roofing Work**	___ **Contract #15**	**Mechanical**
___ **Contract #7**	**Furnish Hollow Metal/Doors/Hardware**	___ **Contract #15A**	**Plumbing**
___ **Contract #8**	**Aluminum Storefront/Windows/ Glass and Glazing**	___ **Contract #15B**	**HVAC**
		___ **Contract #16**	**Sprinkler Work**
___ **Contract #9**	**Drywall/Metal Stud**	___ **Contract #17**	**Electrical**
		___ **Contract #18**	**Wall Panels**

Name of Bidder: _____

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

(Other License Nos.): _____

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

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

$_____

($)

BID FORM

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

ADD. Alternate No. One – Mechanical Roof Screens

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. All mechanical roof screens.
2. The following remains in scope and shall be considered part of the base bid:
    a. Primary roof structural steel for mechanical roof screen support.

Add/Delete: _____

($)

ADD. Alternate No. Two – Polished Concrete Floor Finish

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. All polished concrete finish.
2. The following remains in scope and shall be considered part of base bid
    a. All sealed concrete flooring.

Add/Delete: _____

($)

ADD. Alternate No. Three – Middle School Corridor Lockers

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. All lockers
2. The following remains in scope and shall be considered part of base bid
    a. Wall, floor, and base behind locker assemblies.

Add/Delete: _____

($)

ADD. Alternate No. Four – Locker Room Lockers

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. All athletic lockers.
2. The following remains in scope and shall be considered part of base bid
    a. All floor finished under the locker assemblies
    b. All wall and base behind locker assemblies.

Add/Delete: _____

($)

BID FORM

ALTERNATES (CON'T)

ADD. Alternate No. Five – Cable Trays

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. All Cable trays
2. The following remains in scope and shall be considered part of base bid
    a. All low voltage wiring.

Add/Delete: _____

($)

ADD. Alternate No. Six – Epoxy Flooring in Science Labs

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. All epoxy flooring in science labs.
    b. All epoxy base in science labs.
2. The following remains in scope and shall be considered part of base bid
    a. Sealed concrete in all science labs
    b. Rubber base assemblies in science labs

Add/Delete: _____

($)

ADD. Alternate No. Seven – Early Learning Center

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. Early Childhood Center in its entirety
2. The following remains in scope and shall be considered part of base bid
    a. Site Work required for Early Childhood center building pad.

Add/Delete: _____

($)

ADD. Alternate No. Eight – Performance & Payment Bonds

1. Base Bid Item: The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
    a. Cost to provide a performance and payment bond for contract.
2. The following remains in scope and shall be considered part of base bid
    a. No bonds on base bid.

Add/Delete: _____

($)

BID FORM

ALLOWANCES

Contract No. 1 Site Work
1 – Include the lump sum of the following amount **$100,000** in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager. See Section 012100 Allowances.

Contract No. 2 Concrete Work
2 – Include the lump sum of the following amount **$25,000** in the contract for cold weather protection of concrete work. See Section 012100 Allowances.

Contract No. 3 Masonry Work
3 – Include the lump sum of the following amount **$25,000** in the contract for cold weather protection of masonry work. See Section 012100 Allowances..

Contract No. 5 Carpentry & General Work
4 – Include the lump sum of the following amount **$50,000** in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager. See Section 012100 Allowances.

Contract No. 5 Carpentry & General Work
5 –Include the lump sum of the following amount **$10,000** in the contract for temporary enclosures as described in Section 015000 Temporary Construction Utilities, Facilities & Control Item 3.14 Enclosures. See Section 012100 Allowances.

Contract No. 6 Roofing Work
6 – Include the lump sum of the following amount **$25,000** in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager. See Section 012100 Allowances.

Contract No. 9 Drywall/Metal Stud
7 – Include the lump sum of the following amount of **$10,000** in your contract for patching plaster walls and ceilings. Cost of work to be determined on a time and material basis. See Section 012100 Allowances.

.

Contract No. 15 Mechanical
8 – Include the lump sum of the following amount **$50,000** in the contract for the temp heat fuel cost. Cost of work to be determined by fuel company receipts with the amount of fuel and cost per gallon. All equipment and labor for temp heat is part of the contract. This allowance is for fuel cost only. See Section 012100 Allowances.

Contract No. 16 Electrical
9 – Include the lump sum of the following amount of **$25,000** in your contract for analysis and coordination study of electrical system. See Section 012100 Allowances.

Delmarva Christian School
21777 Sussex Pines Rd. Georgetown, Delaware
Project No. DMCHS22001

BID FORM

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

ADD

UNIT PRICE No. 1.01: **Satisfactory fill in Place:** Indicate cost to provide satisfactory fill in place, furnished, placed and compacted. Unit of Measurement: cubic yards

Contract A-1. $ _____

UNIT PRICE No. 1.02: **Stone in place:** Indicate cost to provide stone in place and compacted. Unit of Measurement: cubic yards

Contract A-1. $ _____

UNIT PRICE No. 1.03: **Geo-Fabric in place:** Indicate cost to provide Geo-Fabric in place. Unit of Measurement: Square yards

Contract A-1. $ _____

UNIT PRICE No. 1.04: **Undercut & disposal (mass):** Indicate cost for mass excavation & disposal. Unit of Measurement: Cubic yards

Contract A-1/A-14. $ _____

UNIT PRICE No. 1.05: Undercut and disposal (trench) per cubic yard. **Undercut & disposal (trench):** Indicate cost for trench excavation & disposal. Unit of Measurement: Cubic yards.

Contract A-1/A-14/A-16. $ _____

UNIT PRICE No. 1.06: **Select (trench) Backfill:** Indicate cost to provide satisfactory trench fill furnished, placed and compacted Unit of Measurement: cubic yards.

Contract A-1/A-14/A-16. $ _____

UNIT PRICE No. 1.07: **Top soil:** Indicate cost to provide top soil in place and compacted. Unit of Measurement: cubic yards.

Contract A-1. $ _____

UNIT PRICE No. 1.08: **Removal of unsuitable soil and replacement of suitable soil,** Indicate cost to remove, disposed of unsuitable unclassified materials, and to provide, place and compact suitable soil**.** Unit of Measurement: cubic yards.

Contract A-1. $ _____

Delmarva Christian School
21777 Sussex Pines Rd. Georgetown, Delaware
Project No. DMCHS22001

BID FORM

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 thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

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.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____calendar days of the Notice to Proceed.

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

Non-Collusion Statement
Bid Security

Delmarva Christian School
21777 Sussex Pines Rd. Georgetown, Delaware
Project No. DMCHS22001

BID FORM

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 *(to the Capital School District)*.

All the terms and conditions of *(Project or Contract Number)* have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

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.

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)

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

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

blank

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

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

The Owner and Contractor agree as follows.

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

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

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.

TABLE OF ARTICLES

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.)

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.)

[ ] 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

§ 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.)

§ 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.)

§ 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 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 day of the month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment shall be made by the Owner not later than ( ) 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 percent (%). 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 in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of percent (%);

.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 percent (%) 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.)

§ 5.1.5 Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price

§ 5.1.5.1 With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit A, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor; less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

§ 5.1.5.2 Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.

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

.1 Take the Cost of the Work as described in Exhibit A, Determination of the Cost of the Work;

.2 Add the Contractor's Fee, less retainage of percent (%). The Contractor's Fee shall be computed upon the Cost of the Work described in that Section at the rate stated in that Section; or if the Contractor's Fee is stated as a fixed sum, an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;

.3 Subtract retainage of percent (%) from that portion of the Work that the Contractor self-performs;

.4 Subtract the aggregate of previous payments made by the Owner;

.5 Subtract the shortfall, if any, indicated by the Contractor in the documentation required by Article 5 or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

.6 Subtract amounts, if any, for which the Construction Manager or Architect has withheld or withdrawn a Certificate for Payment as provided in Section 9.5 of AIA Document A232™–2009, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition.

§ 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon (1) a mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.5.5 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has used

amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

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

§ 5.1.6 Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price

§ 5.1.6.1 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner or Architect to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor; less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

§ 5.1.6.2 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.

§ 5.1.6.3 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. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work for which the Contractor has made or intends to make actual payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

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

.1 Take that portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values. Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.10 of AIA Document A232–2009;

.2 Add that portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work, or if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing;

.3 Add the Contractor's Fee, less retainage of percent (%). The Contractor's Fee shall be computed upon the Cost of the Work at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, shall be an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;

.4 Subtract retainage of percent (%) from that portion of the Work that the Contractor self-performs;

.5 Subtract the aggregate of previous payments made by the Owner;

.6 Subtract the shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

.7 Subtract amounts, if any, for which the Construction Manager or Architect have withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A232–2009.

§ 5.1.6.5 The Owner and the Contractor shall agree upon a (1) mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.6.6 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Construction Manager or Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; that the

Construction Manager or Architect have made exhaustive or continuous on-site inspections; or that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

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

§ 5.2 Final Payment

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2 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:

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.

[ ] Litigation in a court of competent jurisdiction.

[ ] Other: *(Specify)*

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:
(Name, address and other information)

§ 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

§ 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.)

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:

.1 AIA Document A132™–2009, Exhibit A, Determination of the Cost of the Work, if applicable.

.2 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed, or the following:

.3 AIA Document E202™–2008, Building Information Modeling Protocol Exhibit, if completed, or the following:

.4 Other documents, if any, listed below:
(List here any additional documents which are intended to form part of the Contract Documents. AIA Document A232–2009 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

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.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name and title)	*(Printed name and title)*

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

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

OWNER:
(Name, legal status and address)

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

BOND
Date:
(Not earlier than Construction Contract Date)

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

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

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

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

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

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

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

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

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

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

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

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

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

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

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

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

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

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

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

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

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

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

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

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

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

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

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

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

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

§ 14 Definitions

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

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

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

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

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

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

§ 16 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

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

OWNER:
(Name, legal status and address)

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

BOND
Date:
(Not earlier than Construction Contract Date)

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

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

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

(FOR INFORMATION ONLY — Name, address and telephone)

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

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

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

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

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

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

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

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

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

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

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

.2 have sent a Claim to the Surety (at the address described in Section 13).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 16 Definitions

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

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

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

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

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

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

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

§ 18 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

AIA® Document G732™ – 2009

Application and Certificate for Payment, Construction Manager as Adviser Edition

TO OWNER:	**PROJECT:** blank	**APPLICATION NO:** 001	**DISTRIBUTION TO:** OWNER
		PERIOD TO:	CONSTRUCTION MANAGER
FROM CONTRACTOR:	**VIA CONSTRUCTION MANAGER:**	**CONTRACT DATE:**	ARCHITECT
CONTRACT FOR:	**VIA ARCHITECT:**	**PROJECT NOS:** / /	CONTRACTOR
			FIELD
			OTHER

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703™, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM		$
2. NET CHANGES IN THE WORK		$ 0.00
3. CONTRACT SUM TO DATE *(Line 1 ± 2)*		$ 0.00
4. TOTAL COMPLETED AND STORED TO DATE *(Column G on G703)*		$
5. RETAINAGE:		
a. 0 % of Completed Work *(Column D + E on G703)*	$ 0.00	
b. 0 % of Stored Material *(Column F on G703)*	$ 0.00	
Total Retainage *(Lines 5a + 5b, or Total in Column I on G703)*		$ 0.00
6. TOTAL EARNED LESS RETAINAGE *(Line 4 minus Line 5 Total)*		$ 0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT *(Line 6 from prior Certificate)*		$
8. CURRENT PAYMENT DUE		$ 0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE *(Line 3 minus Line 6)*	$ 0.00	

SUMMARY OF CHANGES IN THE WORK	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this month including Construction Change Directives	$	$
TOTALS	$ 0.00	$ 0.00
NET CHANGES IN THE WORK	$ 0.00	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on evaluations of the Work and the data comprising this application, the Construction Manager and Architect certify to the Owner that to the best of their knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $ _____

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

CONSTRUCTION MANAGER:

By: _____ Date: _____

ARCHITECT: *(NOTE: If Multiple Prime Contractors are responsible for performing portions of the Project, the Architect's Certification is not required.)*

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AIA® Document G703™ – 1992

Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
	GRAND TOTAL								

SECTION 006300 - STANDARD FORMS CERTIFICATES AND MODIFICATION FORMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Standard Forms.

1.2 RELATED SECTIONS

A. General and Supplementary Conditions.

1.3 STANDARD FORMS

A. Following is a list of the standard Documents published by the American Institute of Architects which will be used during the performance of Work covered by the Contract Documents.

B. The Contractor shall familiarize himself with the contents of the Documents, as he will not only be required to execute certain Documents, but will be required to prepare certain others in performing his work in accordance with the Contract Documents.

C. The Contractor will be required to obtain for his own use, those Documents marked with an asterisk (*). The Documents can be obtained, at nominal cost, from the Documents Division, The American Institute of Architects, 1735 New York Avenue, NW, Washington, DC 20006, as well as other local sources.

D. FORMS

	Change Order (Architect Form)
G702/CM*	Application and Certificate for Payment
G703*	Continuation Sheet
G704	Certificate of Substantial Completion
G705*	Certificate of Insurance
G706*	Contractor's Affidavit of Payment of Debts and Claims
G706A*	Contractor's Affidavit of Release of Liens
G707*	Consent of Surety Company to Final Payment
G707A*	Consent of Surety to Reduction in or Partial Release of Retainage
G805*	List of Subcontractors

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 006300

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)

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

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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.

TABLE OF ARTICLES

INDEX
(Topics and numbers in bold are section headings.)

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.

§ 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 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 carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, 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.

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

§ 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 measurements 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 Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction 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 between 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 procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner, 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.

§ 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, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 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 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 appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project 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.

§ 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.

§ 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.

§ 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 Architect (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.

§ 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 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 Documents 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 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 Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner, Construction Manager or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner, Construction Manager or Architect has no reasonable objection. 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 respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement 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.

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 clean 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.

§ 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:

.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.

§ 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 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, 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 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 Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary

liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 Failure of Payment

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.

§ 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.

§ 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, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors;

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and

.4 construction or operations by the Owner or other Contractors.

§ 10.2.2 The Contractor shall 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 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 resumed 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 not 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.

§ 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 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.

§ 11.3.4 If the Contractor 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 each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance 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.

§ 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 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 (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, Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Construction Manager and Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager and Architect of when and where tests and inspections are to be made so 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.

§ 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:

.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

.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 Decision 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.

§ 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 parties 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.

§ 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.

SECTION 007300 - SUPPLEMENTARY GENERAL CONDITIONS A232-2009

The following supplements modify the "General Conditions of the Contract for Construction," AIA Document A201-1997. 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

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:

1.2.2 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.

1.2.3 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.

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

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

Add the following paragraphs:

"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. Prior to re-use of construction documents for a Project in which the Architect is not also involved, the Owner will remove from such documents all identification of the original Architect, including name, address and professional seal or stamp."

ARTICLE 2: OWNER

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

To Subparagraph 2.2.3 – Add the following sentence:

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

Delete Subparagraph 2.2.5 in its entirety and substitute the following:

2.2.5 The Contractor shall be furnished free of charge up to one (1) set of the Drawings and Project Manuals. Additional sets will be furnished at the cost of reproduction, postage and handling.

ARTICLE 3: CONTRACTOR

3-.1.1 The contractor is the persons identified in summary of work, Section 011100, Listed as Bid Pac A Contract a thru 14.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

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

3.2.5 The Contractor shall own all entities (products, materials, equipment and systems) identified in the Project Manual (Specifications) and drawings, regardless of whether said entities are only referenced in either the Project Manual or the drawings. Failure of the successful low bidder to identify all required quantities and locations of all project entities in the bidding period will not exempt the low bidder from the contractual responsibility for these items. In the event of a conflict between the Project Manual and the drawings, the Contractor shall own the more costly of the conflicting scenarios. The conflict, once identified and reported by the Contractor, will be resolved by the Architect."

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 Construction Manager to be incompetent or disposed to be so disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or 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 Construction Manager 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 Not later than thirty (30) days from the Contract Date, the contractor shall provide a list of all products proposed for installation, including the name of the manufacturer of each, for approval by the Owner and Architect. The list shall be tabulated by, and be complete for, each specification section. Where applicable, subcontractors' names shall be included in such list.

3.4.5 After the Contract has been executed, unless noted otherwise, the Owner and Architect will consider a formal request for the substitution of products in place of those specified, under the following conditions:

a. The request is accompanied by complete data on the proposed substitution substantiating compliance with the Contract Documents including product identification and description, performance and test data, references and samples where applicable, and an itemized comparison of the proposed substitution with the products specified or named by Addenda, with data relating to Contract time schedule, design and artistic effect where applicable, and its relationship to separate contracts.

b. The request is accompanied by accurate cost data on the proposed substitution in comparison with the product specified, whether or not modification of the Contract Sum is to be a consideration.

3.4.6 Requests for substitution based on Clause 3.4.5 above, when forwarded by the Contractor to the Architect, are understood to mean that the Contractor:

a. Represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;

b. Will provide the same guarantee for the substitution that he would for that specified;

c. Certifies that the cost data presented is complete and includes all related costs under this Contract, but excludes costs under separate contracts and the Architect's redesign costs, and that he waives all claims for additional costs related to the substitution which subsequently becomes apparent; and

d. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

3.4.7 Substitutions will not be considered if:

a. They are indicated or implied on shop drawing submissions without the formal request required in Clause 3.4.5 above; or

b. For their implementation they require a substantial revision of the Contract Documents in order to accommodate their use.

c. The proposed product substitution does not provide a positive benefit to the Owner in one or more of the following ways:

1. Reduces the Contract Sum.
2. Reduces the Contract Time.
3. Provides superior quality, aesthetic and functional characteristics without added Contract Costs or Contract Time.
4. Avoidance of significant delay to completion of the Work in the event that delivery of products previously submitted by the Contractor, approved by the Architect and Owner, and ordered by the Contractor in accordance with time schedules established for this Contract, will be significantly delayed due to circumstances beyond the control of the Contractor, such as labor disputes, fire, unusual delay in transportation, inability or unwillingness of the manufacturer of the product specified to make delivery within the time requirements of this Contract.

3.4.8 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 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.

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

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

3.5.3 In addition to the General Guarantee there are other guarantees 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 guarantees will commence at the same time as the General Guarantee.

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.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.2

Add the following Paragraph:

4.2.15.1 There will be no full-time project representative provided by the Owner or Architect on this project. The construction manager will be the owner's representative.

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

ARTICLE 7: CHANGES IN THE WORK

(SEE ARTICLE 7: CHANGES IN WORK OF 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

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 their rights under the Contract.

ARTICLE 9: PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES

Add the following Paragraphs:

9.2.1 The Schedule of Values shall be submitted using AIA Document G702, Continuation Sheet to G703.

9.2.2 The Schedule of Values is to include a line item for Project Closeout Document Submittal. The value of this item is to be no less than 0.5% of the initial contract amount.

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

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Paragraphs:

10.1.2 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.

10.1.3 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, Construction Manager 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.

10.5 FIRE PROTECTION

10.5.1 During construction, take precautions to prevent and control fire hazards. Use of open flames and welding or cutting equipment should be properly supervised. Tarpaulins should be of a flameproof type. Emergency protection in the form of extinguishers, water pails, and small hose streams should be provided.

10.5.2 The Contractor is to take precautions against theft within the existing building by, among other measures, securing the facility during construction, and at the end of the construction day.

ARTICLE 11: INSURANCE AND BONDS

Subparagraph 11.1.1.5 line 1, delete "other than to the Work itself."

11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following, or greater if required by law:

Contractor:

The Contractor shall maintain the following insurance at its sole cost and expense:

(a) Builders Risk insurance for the full replacement cost of work in place and materials stored at or upon the property and/or in transit to the property. Such insurance shall contain a Replacement Cost valuation provision, shall not contain a Coinsurance provision, shall contain an "All Risk" Insuring Agreement, including Flood, Accumulating Surface Waters, Earthquake and Earth Movement and Design-Deficiency Collapse, shall contain a "Permission to Occupy" and a "Permission to Test" provision, shall include Building Ordinance coverages and shall include a "Soft Cost" endorsement for exposures as required by Owner. Such insurance shall include as named Insureds the Contractor, Owner, all sub-contractors of every tier and any other party interest as required of Owner, as their respective interests may appear.

(b) Commercial General Liability insurance (written on an "Occurrence" basis) for injuries to persons and damage to property, in limits of not less than One Million Dollars ($1,000,000) for any one occurrence and Two Million Dollars ($2,000,000) as an annual aggregate (such annual aggregate limit to be on a "per project" basis). Such insurance shall name Owner as an additional insured and shall be primary and non-contributory with respect to any similar insurance maintained by Owner. Such insurance shall include Contractual Liability coverage insuring the obligations assumed by the Contractor hereunder, Personal Injury Liability coverage, Independent Contractor=s Liability coverage and Completed Operations Liability coverage. Products and Completed Operations coverage shall be maintained for a minimum period of one year from the earlier to occur of final payment or the date which is ninety (90) days after substantial completion of this contract.

(c) Workers= Compensation and Employer=s Liability insurance for all employees of the Contractor providing statutory coverage and Employer=s Liability insurance with limits not less than One Hundred Thousand Dollars ($100,000) for each accident, Five Hundred Thousand Dollars ($500,000) as a policy limit for disease and One Hundred Thousand Dollars ($100,000) per employee for disease.

(d) Automobile Liability (applicable to all owned, non-owned and hired vehicles) for injuries to persons and damage to property in limits of not less than One Million Dollars ($1,000,000) for each accident on a combined single limit basis. Such insurance shall name Owner as an additional insured and shall be primary and non-contributory with respect to any similar insurance maintained by Owner.

(e) Umbrella Liability insurance (written on an "Occurrence" basis) for injuries to persons and damage to property, in limits of not less than Five Million Dollars ($5,000,000) for any one occurrence and Five Million Dollars ($5,000,000) as an annual aggregate (such annual aggregate limit to be on a "per project" basis.) Such insurance shall name Owner as an additional insured and shall be primary and non-contributory with respect to any similar insurance maintained by Owner. Such insurance shall not have a Self-Insured Retention of more than Ten Thousand Dollars ($10,000).

(f) Such additional insurance as may be required by any lender to the project; and

(g) All insurance shall be in form and issued by companies licensed to issue insurance in the State and otherwise acceptable to Owner and its lenders and shall prohibit cancellation or reduction in coverage upon less than thirty (30) days prior written notice to Owner and any lender. Owner shall receive evidence of all required insurance before any work is commenced. At least thirty (30) days prior to the expiration of each such insurance policy, Contractor shall obtain and deliver to Owner and any lender a renewal or substitute policy meeting the above requirements.

11.1.5 Each of the parties comprising the Insured shall for the purpose of this Section be considered as a separate and distinct entity and the words "the Insured" shall be considered as applying to each party in the same manner as if a separate policy had been issued to each of the said parties and the Insurers agree a separate policy had been issued to each of the said parties and the Insurers agree to waive all rights of subrogation which the Insurers may have against any of the aforesaid parties arising out of any occurrence in respect of which a claim is made hereunder provided always that the liability of the Insurers shall not exceed the Limit of Indemnity.

11.2 OWNER’S LIABILITY INSURANCE

Delete Paragraph 11.2 in its entirety.

11.3 PROPERTY INSURANCE

Delete Paragraph 11.3 in its 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 ADDITIONAL INSURED.

11.4.1 Owner and Construction Manager be named as additional insured in all Certificates of Insurance furnished by the Contractor.

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.

ARTICLE 13: MISCELLANEOUS PROVISIONS

Add the following Paragraph:

13.8 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.”

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.

13.8 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.

END OF SUPPLEMENTARY GENERAL CONDITIONS

SECTION 007300 - ATTACHMENT A - CONSTRUCTION MANAGER GENERAL CONDITIONS

COORDINATION OF THE CONTRACT

1. The Construction Manager will provide general coordination of all contracts between the Owner and Contractors, including the functions hereinafter described.

2. Coordinator, and in addition, home office executive, technical and clerical support for management, communications, documentation, inspection, planning, scheduling, estimating and accounting. He will furnish, maintain and operate a temporary field office and telephone.

3. The Construction Manager will provide support for the Contractors by providing the following General Condition Construction Items: ceremonies construction work; temporary toilets; first aid stations; bulletin board; job signs; temporary fire extinguishers.

   Temporary heat provided by Mechanical Contractor is space heat for certain finish trades unless otherwise specifically required by the trade specification. In no way should the contractor misconstrue this item to include weather protection for concrete or masonry.

4. The Construction Manager will establish a reference point and benchmark for layout and engineering. Further actual layout and engineering required on the site to accomplish this Bid Pac work shall be the responsibility of the Contractor.

5. The Construction Manager will:

   (a) Review all changes proposed by the Contractor, Architect or Owner and make recommendations to the Architect and Owner on the schedule and cost implications and may initiate requests for changes in its opinion required by field conditions or progress of the work.

   (b) Review the adequacy of each Contractor's personnel and equipment and the availability of necessary materials and supplies. If, in the opinion of the Construction Manager, a Contractor's personnel or equipment or the availability of necessary materials and supplies is inadequate, the Construction Manager shall give written notice to the Contractor specifying such inadequacy. If such inadequacy is not cured within five (5) working days after receipt of such notice, the Construction Manager shall have the right to order the Contractor and all of his subcontractors to stop work until the inadequacy is cured. Such a work stoppage shall not entitle the Contractor or any subcontractors to any extension of the schedule, and the Contractor shall remain responsible for completing its work on time.

   (c) Establish and maintain a complete onsite library of all Contract Documents, approved shop drawings and approved material samples. Maintain an onsite directory which includes contracts for all sources of materials, labor and services relating to the project, and maintain at the job site a current marked record set of the contract drawings and specifications.

   (d) Conduct pre-construction conferences with successful bidders. Schedule and conduct job meetings to be attended by the Contractors and representatives of

the Owner to discuss such matters as procedures, progress, problems and scheduling. Distribute minutes of such meetings to all parties.

6. Construction Manager's Daily Inspection Review:

   (a) The Construction Manager will make daily review of work. In the event the interpretation of the meaning and intent of the plans and specifications becomes necessary during construction, he will consult with the Architect, request the Architect's interpretation in writing and transmit same to the appropriate Contractor. Pending receipt of such interpretation from the Architect, the Construction Manager shall have the right to stop the work of the Contractor. These reviews are intended to supplement but not replace those inspections that are the responsibility of the Architects and their consultants. These reviews do not relieve the Contractor from his responsibility to the Owner.

7. Construction Manager's Review of Safety Program:

   (a) The Construction Manager will review the safety program as developed by each Contractor. (The Performance of such services by the Construction Manager shall not relieve the Contractor of his responsibilities for the safety of persons or property, and compliance with statutes, rules regulations and orders applicable to the conduct of the work.)

8. Construction Manager – Submittals Expediting Schedule:

   (a) The Construction Manager will prepare and maintain a separate Submittals Expediting Schedule which schedules construction items requiring submission to Architect or Owner for review and approval prior to ordering, fabrication or delivery, such as: shop drawings preparation, submission of shop drawings samples – color schedules, templates, coordination drawings, equipment and fixture schedules, manufacturer literature, review and approval of submittal items, fabrication of equipment and products, shipping and delivery.

9. Construction Manager – Contractor's Progress Payments:

   (a) The Construction Manager will review application for each Contractor's Progress Payments for compliance with the value of work accomplished and submit recommendations to the Architect.

10. Construction Manager – Change Orders:

    (a) The Construction Manager will review all change order requests and submit recommendations to the Architect.

11. Construction Manager – Expansion of the Construction Schedule:

    (a) The Construction Manager will meet with each Contractor who receives an award to expand the construction schedule to include: shop drawings preparation, samples, review and approvals, fabrication, equipment and

product delivery and testing activities. He will monitor schedule periodically to identify slippage. He will recommend to each Contractor corrective action as required to maintain schedule compliance.

12. Construction Manager – Master Schedule Bar Chart:

(a) The Construction Manager will display a Master Schedule Bar Chart in the job office showing the duration and location of each activity and a summary bar chart depicting each major construction activity time scaled to a calendar. He will also furnish identical information to the Architect and Owner.

RECORD DRAWINGS

13. All Contractors shall report to the Construction Manager all changes, deviations, additions or deletions related to the contract documents along with dimensional locations of underground utilities and other items which will be hidden from view in the completed construction. The Construction Manager will maintain a complete set of sepia reproducible of the contract documents upon which these items shall be recorded. At the completion of the project their record drawings will be turned over to the Owner for his use in building maintenance.

COOPERATION OF PRIME CONTRACTORS

14. In as much as the completion of the building within the prescribed time is dependent very largely upon the close and active cooperation of all those engaged therein, it is, therefore, expressly understood and agreed that each Contractor will layout and install his work as such time or times and in such manner as consistent with the Master Schedule Bar Chart to permit the carrying forward of the work of other Contractors.

JOB MEETINGS

15. A meeting shall be conducted bi-weekly by the Construction Manager for the purpose of coordinating and expediting the work. It shall be mandatory that each Contractor and/or his Superintendent be in attendance. Also, from time to time, the Construction Manager will designate certain subcontractors to attend. Additional mandatory meetings may be called by the Construction Manager. Such as weekly progress meetings on Mondays with the onsite Superintendent or others needed to attend for all trades working on the site to discuss job problems.

CONTRACTOR'S PLANT AND PERSONNEL

16. Each Contractor shall provide for his own forces the following as necessary:

(a) Job Site Office with telephone.

(b) Personnel/Tool Locker.

(c) Equipment and Material Storage Facilities.

(d) Onsite supervision of personnel and plant acceptable to the Construction Manager. Supervisions shall not be changed during the project duration without approval of the Construction Manager. If required by the

Construction Manager, the Contractor shall immediately remove any personnel from the project and replace same with approved personnel.

(e) The Contractor shall provide drinking water in accordance with Public Health requirements.

(f) Provide any additional temporary lighting as required and protection for new or existing finishes.

(g) Extension cords and light bulbs.

(h) The Contractor shall at the completion of his work remove all such temporary utilities.

(i) Pay for all power consumed.

SAFETY

17. The Construction Manager will have the right to correct any unsafe project conditions that exist due to the negligence of any Contractor and may reduce the Contractor's payments in the amount required to make necessary safe project conditions. In no way does this mean that the Construction Manager has the responsibility for any safety requirements that are specifically that of the Contractor.

17.1 Prime Contractor acknowledges that it is solely responsible for the health and safety of its employees, agents, subcontractors, and other persons on the adjacent to the Work Site. Prime contractor agrees that it shall be liable for any violation of any law, regulation, statue or ordinance applicable to Prime Contractor's work. The Prime Contractor shall be liable to the Owner and Construction Manager for all loss, cost and expense attributable to any act or omission by the Prime Contractor, or anyone acting on its behalf, including but not limited to any fines, penalties or assessments levied against the Owner and/or Construction Manager, and agrees that any such amounts may be deducted from any payment due to the Prime Contractor.

18. The Carpentry and General Work Contract will provide and install temporary safety rails for guarding any floor and wall openings during construction.

SCHEDULE

19. If the project progresses well and the project is ahead of schedule, the Contractor must take this point into consideration. At no time shall a Contractor use the Schedule Advancement as a reason for not completing work.

CONSTRUCTION MANAGER'S AUTHORITY REGARDING CLEANUP

20. The site and all portions of the work in progress shall be cleaned up daily.

21. In the event that any contractor fails to properly do his cleanup work during the construction period (as noted in subparagraph 4.15.1), the Construction Manager shall, after giving the contractor a 48 hour written notice, hire a clean up crew to do the necessary cleanup and then back-charge the contractor for doing this cleanup work. Note that when performing his required cleanup, the contractor shall deposit all debris at a place designated by the

Construction Manager, or remove debris from the site. No burning will be permitted on this site.

22. The contractor shall furnish, at the construction manager's discretion, one (1) man for two (2) hours per week to police the construction site clean up of miscellaneous debris.

END CM GENERAL CONDITIONS

ACORD. CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

PRODUCER

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.

INSURED

INSURERS AFFORDING COVERAGE	NAIC #
INSURER A:	
INSURER B:	
INSURER C:	
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	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
		GENERAL LIABILITY				EACH OCCURRENCE	$
		COMMERCIAL GENERAL LIABILITY				DAMAGE TO RENTED PREMISES (Ea occurrence)	$
		CLAIMS MADE ☐ OCCUR				MED EXP (Any one person)	$
						PERSONAL & ADV INJURY	$
		GEN'L AGGREGATE LIMIT APPLIES PER:				GENERAL AGGREGATE	$
		POLICY ☐ PRO-JECT ☐ LOC				PRODUCTS - COMP/OP AGG	$
		AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT (Ea accident)	$
		ANY AUTO				BODILY INJURY (Per person)	$
		ALL OWNED AUTOS				BODILY INJURY (Per accident)	$
		SCHEDULED AUTOS				PROPERTY DAMAGE (Per accident)	$
		HIRED AUTOS					
		NON-OWNED AUTOS					
		GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT	$
		ANY AUTO				OTHER THAN AUTO ONLY: EA ACC	$
						AGG	$
		EXCESS/UMBRELLA LIABILITY				EACH OCCURRENCE	$
		OCCUR ☐ CLAIMS MADE ☐				AGGREGATE	$
		DEDUCTIBLE					$
		RETENTION $					$
		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				WC STATU-TORY LIMITS ☐ OTH-ER	
		ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED?				E.L. EACH ACCIDENT	$
		If yes, describe under SPECIAL PROVISIONS below				E.L. DISEASE - EA EMPLOYEE	$
		OTHER				E.L. DISEASE - POLICY LIMIT	$

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

SAMPLE

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL _____ 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 25 (2001/08)

SECTION 008000 - GENERAL REQUIREMENTS

TABLE OF ARTICLES

ARTICLE 1: GENERAL

1.1 CONTRACT DOCUMENTS

1.1.1 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 to an extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results. In the case of conflict, the most expensive combination of quality and quantity shall govern.

1.1.2 Work shall not begin until the Contractor is in receipt of a bonafide Contract.

1.2 EQUALITY OF EMPLOYMENT

1.2.1

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex or national origin. The Contractor will take positive steps to ensure that 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.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex or national origin."

ARTICLE 2: OWNER
(NOT ADDENDED)

ARTICLE 3: CONTRACTOR

3.1 Schedule of Values: The successful Bidder shall within twenty (20) days after receiving notice to proceed with the work, furnish to the Construction Manager a complete schedule of values on the various items comprising the work.

3.2 Subcontracts: Upon approval of Subcontractors, the Contractor shall award their Subcontracts as soon as possible after the signing of their own contract and see that all material, their own and those of their Subcontractors, are promptly ordered so that the work will not be delayed by failure of materials to arrive on time.

3.3 Before commencing any work or construction, the Trade Contractor is to consult with the Construction Manager as to matters in connection with access to the site and the allocation of Ground Areas for the various features of hauling, storage, etc.

3.4 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 instructions.

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

3.6 The Contractor warrants to the Construction Manager that materials and equipment furnished will be new and of good quality, unless otherwise permitted, and that the work will be free from defects and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved, may be considered defective. If required by the Construction Manager, the Contractor shall furnish evidence as to the kind and quality of materials and equipment provided.

3.7 Unless otherwise provided, the Contractor shall pay all sales, consumer, use and other similar taxes, and shall secure and pay for required permits, fees, licenses, and inspections necessary for proper execution of the Work.

3.8 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work. The Contractor shall promptly notify the Construction Manager if the Drawings and Specifications are observed to be at variance therewith.

3.9 The Contractor shall be responsible to the Construction Manager for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work under contract with the Contractor.

3.10 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project all waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials. The Contractor shall be responsible for returning all damaged areas to their original conditions.

3.11 STATE LICENSE AND TAX REQUIREMENTS

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

3.12 PREFERENCE FOR DELAWARE LABOR

3.12.1 The Contractor shall comply with all requirements set forth in Section 6962, Chapter 69, Title 29 of the Delaware Code.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 CONTRACT SURETY

4.1.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

4.1.2 All bonds will be required as follows unless specifically waived elsewhere in the Bidding Documents.

4.1.3 Contents of Performance Bonds – The bond shall be conditioned upon the faithful compliance and performance by the successful bidder of each and every term and condition of the contract and the proposal, plans, specifications, and bid documents thereof. Each term and condition shall be met at the time and in the manner prescribed by the Contract, Bid documents and the specifications, including the payment in full to every person furnishing materiel or performing labor in the performance of the Contract, of all sums of money due the person for such labor and materiel. (The bond shall also contain the successful bidder's guarantee to indemnify and save harmless the Owner from all costs, damages and expenses growing out of or by reason of the Contract in accordance with the Contract.)

4.1.4 Invoking a Performance Bond – The Construction Manager may, when it considers that the interest of the Construction Manager so require, cause judgement to be confessed upon the bond.

4.1.5 Within twenty (20) days after the date of notice of award of contract, the Bidder to whom the award is made shall furnish a Performance Bond and Labor and Material Payment Bond, each equal to the full amount of the Contract price to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable Bonding Company licensed to do business in the State of Delaware and shall be issued in duplicate.

4.1.6 Performance and Payment Bonds shall be maintained in full force (warranty bond) for a period of twelve months after the date of the Certificate for Final Payment. The Performance Bond shall guarantee the satisfactory completion of the Project and that the Contractor will make good any faults or defects in his work which may develop during the period of said guarantees as a result of improper or defective workmanship, material or apparatus, whether furnished by themselves or their Sub-Contractors. The Payment Bond shall guarantee that the Contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and material for, or on account of, the work included herein. The bonds shall be paid for by this Contractor. The Construction Manager shall have the right to demand that the proof parties signing the bonds are duly authorized to do so.

4.2 FAILURE TO COMPLY WITH CONTRACT

4.2.1 If any firm entering into a contract with the Construction Manager that neglects or refuses to perform or fails to comply with the terms thereof, the Construction Manager which signed the Contract may terminate the Contract and proceed to award a new contract in accordance with this Chapter 69, Title 29 of the Delaware Code or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond. Nothing herein shall preclude the Agency from pursing additional remedies as otherwise provided by law.

4.3 CONTRACT INSURANCE AND CONTRACT LIABILITY

4.3.1 In addition to the bond requirements stated in the Bid Documents, each successful Bidder shall purchase adequate insurance for the performance of the Contract and, by submission of a Bid, agrees to indemnify and save harmless and to defend all legal or equitable actions brought against the Construction Manager, officer and/or employee of the Construction Manager, for and from all claims of liability which is or may be the result of the successful Bidder's actions during the performance of the Contract.

4.3.2 The purchase or nonpurchase of such insurance or the involvement of the successful Bidder in any legal or equitable defense of any action brought against the successful Bidder based upon work performed pursuant to the Contract will not waive any defense which the Construction Manager, its agencies and their respective officers, employees

and agents might otherwise have against such claims, specifically including the defense of sovereign immunity, where applicable, and by the terms of this section, the Construction Manager and all agencies, officers and employees thereof shall not be financially responsible for the consequences of work performed, pursuant to said contract.

4.4 RIGHT TO AUDIT RECORDS

4.4.1 The Construction Manager 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.

4.4.2 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 3 years from the date of final payment under the Subcontract.

ARTICLE 5: SUBCONTRACTORS

5.1 SUBCONTRACTING REQUIREMENTS

5.1.1 All contracts for the construction, reconstruction, alteration or repair of any public building (not a road, street or highway) shall be subject to the following provisions:

1. A contract shall be awarded only to a Bidder whose Bid is accompanied by a statement containing, for each Subcontractor category, the name and address (city or town and State only – street number and P.O. Box addresses not required) of the subcontractor whose services the Bidder intends to use in performing the Work and providing the material for such Subcontractor category.

2. A Bid will not be accepted nor will an award of any Contract be made to any Bidder which, as the Prime Contractor, has listed itself as the Subcontractor for any Subcontractor unless:

   A. It has been established to the satisfaction of the awarding Agency that the Bidder has customarily performed the specialty work of such Subcontractor category by artisans regularly employed by the Bidder's firm;

   B. That the Bidder is duly licensed by the State to engage in such specialty work, if the State requires licenses; and

   C. That the Bidder is recognized in the industry as a bona fide Subcontractor or Contractor in such specialty work and Subcontractor category.

5.1.2 The decision of the awarding Agency as to whether a Bidder who list itself as the Subcontractor for a Subcontractor category shall be final and binding upon all Bidders, and no action of any nature shall lie against any awarding agency or its employees or officers because of its decision in this regard.

5.1.3 After such a Contract has been awarded, the successful Bidder shall not substitute another Subcontractor for any Subcontractor whose name was set forth in the statement which accompanied the Bid without the written consent of the awarding Agency.

5.1.4 No Agency shall consent to any substitution of Subcontractors unless the Agency is satisfied that the Subcontractor whose name is on the Bidders accompanying statement:

A. Is unqualified to perform the work required;

B. Has failed to execute a timely reasonable Subcontract;

C. Has defaulted in the performance on the portion of the work covered by the Subcontract; or

D. Is no longer engaged in such business.

5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.3 ASBESTOS ABATEMENT (BY OTHERS)

5.4 STANDARDS OF CONSTRUCTION FOR THE PROTECTION OF THE PHYSICALLY HANDICAPPED

5.4.1 All Contracts shall conform with the standard established by the Delaware Architectural Accessibility Board unless otherwise exempted by the Board.

5.5 CONTRACT PERFORMANCE

5.5.1 Any firm entering into a Contract that neglects or refuses to perform or fails to comply with its terms, the Agency may terminate the Contract and proceed to award a new Contract or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the performance Bond.

ARTICLE 6: CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

6.1 The Owner reserves the right to simultaneously perform other construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other Projects at the same site.

6.2 The Contractor shall afford the Owner and other Contractors reasonable opportunity for access and storage of materials and equipment, and for the performance of their activities, and shall connect and coordinate their activities with other forces as required by the Contract Documents.

ARTICLE 7: CHANGES IN THE WORK

7.1 The Construction Manager, without invalidating the Contract, may order changes in the Work consisting of Additions, Deletions, Modifications or Substitutions, with the Contract Sum and Contract completion date being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Professional, as the duly authorized agent, the Contractor and the Construction Manager.

7.2 The Contract Sum and Contract Completion Date shall be adjusted only by a fully executed Change Order.

7.3 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Construction Manager, Contractor and the Architect. In all cases, this cost or credit shall be based on the ‘DPE’ wages required and the “invoice price” of the materials/equipment needed.

7.3.1 "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, Social Security/Medicare, and unemployment insurance (a maximum multiplier of 1.35 times DPE).

7.3.2 "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. Rates for equipment that is leased and/or owned by the Contractor or subcontractor(s) shall not exceed those listed in the latest version of the "Means Building Construction Cost Data" publication.

7.3.3 In addition to the above, the Prime Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the Prime Contractor's own forces. For additional subcontractor work, the Subcontractor is allowed a fifteen percent overhead and profit on change order work above and beyond the direct costs stated previously. To this amount, the Prime Contractor will be allowed a mark-up not exceeding seven point five percent (7.5%) on the subcontractors work. These mark-ups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc. No additional costs shall be allowed for changes related to the Contractor's onsite superintendent/staff, or project manager, unless a change in the work changes the project duration and is identified by the CPM schedule. There will be no other costs associated with the change order.

ARTICLE 8: TIME

8.1 Time limits, if any, are as stated in the Project Manual. By executing the Agreement, the Contractor confirms that the stipulated limits are reasonable, and that the Work will be completed within the anticipated time frame.

8.2 If progress of the Work is delayed at any time by changes ordered by the Owner or Construction Manager, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be extended for such reasonable time as the Owner or Construction Manager may determine.

8.3 Any extension of time beyond the date fixed for completion of the construction and acceptance of any part of the Work called for by the Contract, or the occupancy of the building by the Owner, in whole or in part, previous to the completion shall not be deemed a waiver by the Owner of his right to annul or terminate the Contract for abandonment or delay in the matter provided for, nor relieve the Contractor of full responsibility.

8.4 SUSPENSION AND DEBARMENT

8.5 RETAINAGE

8.5.1 The Construction Manager may at the beginning of each project establish a time schedule for the completion of the project. If the project is delayed beyond the completion date due to the Contractor's failure to meet their responsibilities, the Construction Manager may hold permanently, at its discretion, all or part of the Contractor's retainage.

8.5.2 This forfeiture of retainage also applies to the timely completion of the punchlist. A punchlist will only be prepared upon the mutual agreement of the Owner, Construction Manager, Architect and Contractor. Once the punchlist is prepared, all three parties will

by mutual agreement, establish a schedule for its completion. Should completion of the punchlist be delayed beyond the established date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 APPLICATION FOR PAYMENT

9.1.1 Applications for payment shall be made upon AIA Document G702. There will be a ten percent (10%) retainage on all Contractor's monthly invoices until completion of the project. This retainage will become payable upon receipt of all required closeout documentation, provided all other requirements of the Contract Documents have been met.

9.1.2 A date will be fixed for the taking of the monthly account of work done. Upon receipt of Contractor's itemized application for payment, such application will be audited, modified, if found necessary, and approved for the amount. Statement shall be submitted to the Construction Manager.

9.1.3 "Article 6516, Chapter 65, Title 29 of the Delaware Code stipulates annualized interest not to exceed 12% per annum beginning thirty (30) days after the "presentment" (as opposed to the date) of the invoice."

9.2 PARTIAL PAYMENTS

9.2.1 Any Contract executed by the Construction Manager may provide for partial payments at the option of the Construction Manager with respect to materials placed along or upon the sites or stored at secured locations, which are suitable for use in the performance of the contract.

9.2.2 When approved by the Construction Manager, partial payment may include the values of tested and acceptable materials of a nonperishable or noncontaminative nature which have been produced or furnished for incorporation as a permanent part of the work yet to be completed, provided acceptable provisions have been made for storage.

9.2.2.1 Any allowance made for materials on hand will not exceed the delivered cost of the materials as verified by invoices furnished by the Contractor, nor will it exceed the contract bid price for the material complete in place.

9.2.3 If requested by the Owner or Construction Manager, receipted bills from all Contractors, Subcontractors, and material, men, etc., for the previous payment must accompany each application for payment. Following such a request, no payment will be made until these receipted bills have been received by the Owner or Construction Manager.

9.3 SUBSTANTIAL COMPLETION

9.3.1 When the building has been made suitable for occupancy, but still requires small items of miscellaneous work, the Construction Manager will determine the date when the project has been substantially completed.

9.3.2 If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and without terminating the Contract, the Owner may make payment of the balance due for the portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment that it shall not constitute a waiver of claims.

9.4 FINAL PAYMENT

9.4.1 Final payment, including the ten percent (10%) retainage, shall be made within thirty (30) days after the Work is fully completed and the Contract fully performed and provided that the Contractor has submitted the following closeout documentation (in addition to any other documentation required elsewhere in the Contract Documents):

9.4.1.1 Evidence satisfactory to the Construction Manager that all payrolls, material bills, and other indebtedness connected with the work have been paid,

9.4.1.2 An acceptable RELEASE OF LIENS,

9.4.1.3 Copies of all applicable warranties,

9.4.1.4 As-built drawings,

9.4.1.5 Operations and Maintenance Manuals,

9.4.1.6 Instruction Manuals,

9.4.1.7 Consent of Surety to final payment.

9.4.1.8 The Construction Manager reserves the right to retain payments, or parts thereof, for its protection until the foregoing conditions have been complied with, defective work corrected and all unsatisfactory conditions remedied.

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take all reasonable precautions to prevent damage, injury or loss to: workers, persons nearby who may be affected, the Work, materials and equipment to be incorporated, and existing property at the site or adjacent thereto. The Contractor shall give notices and comply with applicable laws ordinances, rules regulations, and lawful orders of public authorities bearing on the safety of persons and property and their protection from injury, damage, or loss. The Contractor shall promptly remedy damage and loss to property at the site caused in whole or in part by the Contractor, a Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

10.2 The Contractor shall notify the Construction Manager in the event any existing hazardous material such as lead, PCBs, asbestos, etc. is encountered on the project. The Construction manager will notify the owner and the Owner will arrange with a qualified specialist for the identification, testing, removal, handling and protection against exposure or environmental pollution, to comply with applicable regulation laws and ordinances. The Contractor and Architect will not be required to participate in or to perform this operation. Upon completion of this work, the Owner will notify the Construction Manager and Architect in writing the area has been cleared and approved by the authorities in order for the work to proceed. The Contractor shall attach documentation from the authorities of said approval.

10.3 As required in the Hazardous Chemical Information Act of June 1984, all vendors supplying any materials 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 warning caution 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 any foreseeable emergency situation. Material Safety Data Sheets must be provided directly to the Owner along with the shipping slips that include those products.

10.4 The Contractor shall certify to the Owner that materials incorporated into the Work are free of all asbestos. This certification may be in the form of Material Safety Data Sheet (MSDS) provided by the product manufacturer for the materials used in construction, as specified or as provided by the Contractor.

ARTICLE 11: INSURANCE AND BONDS

11.1 The Contractor shall carry all insurance required by law, such as Unemployment Insurance, etc. The Contractor shall carry such insurance coverage as they desire on their own property such as a field office, storage sheds or other structures erected upon the project site that belong to them and for their own use. The Subcontractors involved with this project shall carry whatever insurance protection they consider necessary to cover the loss of any of their personal property, etc.

11.2 Upon being awarded the Contract, the Contractor shall obtain a minimum of two (2) copies of all required insurance certificates called for herein, and submit one (1) copy of each certificate, to the Construction Manager, within 20 days of contract award.

11.3 Bodily Injury Liability and Property Damage Liability Insurance shall, in addition to the coverage included herein, include coverage for injury to or destruction of any property arising out of the collapse of or structural injury to any building or structure due to demolition work and evidence of these coverages shall be filed with and approved by the Construction Manager..

11.4 The Contractor's Property Damage Liability Insurance shall, in addition to the coverage noted herein, include coverage on all real and personal property in their care, custody and control damaged in any way by the Contractor or their Subcontractors during the entire construction period on this project.

11.5 Builders Risk (including Standard Extended Coverage Insurance) on the existing building during the entire construction period, shall not be provided by the Contractor under this contract. The Owner shall insure the existing building and all of its contents and all this new alteration work under this contract during entire construction period for the full insurable value of the entire work at the site. Note, however, that the Contractor and their Subcontractors shall be responsible for insuring building materials (not yet installed and stored) and their tools and equipment whenever in use on the project, against fire damage, theft, vandalism, etc.

11.6 Certificates of the insurance company or companies stating the amount and type of coverage, terms of policies, etc., shall be furnished to the Owner, within 20 days of contract award.

11.7 The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

11.7.1 Contractor's Contractual Liability Insurance

Minimum coverage to be:

Bodily Injury	$ 500,000	for each person
	$1,000,000	for each occurrence
	$1,000,000	aggregate
Property Damage	$ 500,000	for each occurrence
	$1,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury	$ 500,000	for each person
	$1,000,000	for each occurrence
	$1,000,000	aggregate
Property Damage	$ 500,000	for each occurrence
	$500,000	aggregate

11.7.3 Automobile Liability Insurance

Minimum coverage to be:

Bodily Injury	$1,000,000	for each person
	$1,000,000	for each occurrence
Property Damage	$ 500,000	per accident

11.7.4 Prime Contractor's and Subcontractors' policies shall include contingent and contractual liability coverage in the same minimum amounts as 11.7.1 above.

11.7.5 Workmen's Compensation (including Employer's Liability):

11.7.5.1 Minimum Limit on employer's liability to be as required by law.

11.7.5.2 Minimum Limit for all employees working at one site.

11.7.6 Certificates of Insurance must be filed with the Owner guaranteeing fifteen (15) days prior notice of cancellation, non-renewal, or any change in coverages and limits of liability shown as included on certificates. A certificate of insurance with the job name specified in the description, Delaware Electric Cooperative. is the certificate holder. Also state that the Delaware Electric Cooperative and Richard Y. Johnson & Son, Inc. are additional insured.

11.7.7 Social Security Liability

11.7.7.1 With respect to all persons at any time employed by or on the payroll of the Contractor or performing any work for or on their behalf, or in connection with or arising out of the Contractor's business, the Contractor shall accept full and exclusive liability for the payment of any and all contributions or taxes or unemployment insurance, or old age retirement benefits, pensions or annuities now or hereafter imposed by the Government of the United States and the State or political subdivision thereof, whether the same be measured by wages, salaries or other remuneration paid to such persons or otherwise.

11.7.7.2 Upon request, the Contractor shall furnish Construction Manager such information on payrolls or employment records as may be necessary to enable it to fully comply with the law imposing the aforesaid contributions or taxes.

11.7.7.3 If the Owner is required by law to and does pay any and/or all of the aforesaid contributions or taxes, the Contractor shall forthwith reimburse the Owner for the entire amount so paid by the Owner.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 The Contractor shall promptly correct Work rejected by the Owner, Construction Manager or Architect or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements of the Contract Documents within a period of one year from the date of Substantial Completion, or by terms of an applicable special warranty required by the Contract Documents. The provisions of this Article apply to work done by Subcontractors as well as to Work done by direct employees of the Contractor.

12.2 At any time during the progress of the work, or in any case where the nature of the defects shall be such that it is not expedient to have them corrected, the Construction Manager, at their option, shall have the right to deduct such sum, or sums, of money from the amount of the contract as they consider justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 CUTTING AND PATCHING

13.1.1 The Contractor shall be responsible for all cutting and patching. The Contractor shall coordinate the work of the various trades involved.

13.2 DIMENSIONS

13.2.1 All dimensions shown shall be verified by the Contractor by actual measurements at the project site. Any discrepancies between the drawings and specifications and the existing conditions shall be referred to the Construction Manager for adjustment before any work affected thereby has been performed.

13.3 LABORATORY TESTS

13.3.1 Any specified laboratory tests of material and finished articles to be incorporated in the work shall be made by bureaus, laboratories or agencies approved by the Construction Manager and reports of such tests shall be submitted to the Construction Manager. The cost of the testing shall be paid for by the Contractor.

13.3.2 The Contractor shall furnish all sample materials required for these tests and shall deliver same without charge to the testing laboratory or other designated agency when and where directed by the Construction Manager and/or per the technical specification sections.

13.4 ARCHAEOLOGICAL EVIDENCE

13.4.1 Whenever, in the course of construction, any archaeological evidence is encountered on the surface or below the surface of the ground, the Contractor shall notify the authorities of the Delaware Archaeological Board and suspend work in the immediate area for a reasonable time to permit those authorities, or persons designated by them, to examine the area and ensure the proper removal of the archaeological evidence for suitable preservation in the State Museum.

13.5 GLASS REPLACEMENT AND CLEANING

13.5.1 The Aluminum storefront, window, glass and glazing Contractor shall replace without expense to the Owner or Construction Manager all glass broken during the construction of

the project. If job conditions warrant, at completion of the job the Aluminum Storefront Contractor shall have all glass cleaned and polished.

13.6 WARRANTY

13.6.1 For a period of one year from the date of substantial completion, as evidenced by the date of final acceptance of the work, the contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material or workmanship performed by the contractor or any of his subcontractors or suppliers. However, manufacturer's warranties and guarantees, if for a period longer than one year, shall take precedence over the above warranties. The contractor shall remedy, at his own expense, any such failure to conform or any such defect. The protection of this warranty shall be included in the Contractor's Performance Bond.

ARTICLE 14: TERMINATION OF CONTRACT

14.1 If the Contractor defaults or persistently fails or neglects to carry out the Work in accordance with the Contract Documents or fails to perform a provision of the Contract, the Construction Manager, after seven days written notice to the Contractor, may make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. Alternatively, at the Construction Manager 's option, and the Construction Manager may terminate the Contract and take possession of the site and of all materials, equipment, tools, and machinery thereon owned by the Contractor and may finish the Work by whatever method the Construction Manager may deem expedient. If the costs of finishing the Work exceed any unpaid compensation due the Contractor, the Contractor shall pay the difference to the Construction Manager.

14.2 “If the continuation of this Agreement is contingent upon the appropriation of adequate state, or federal funds, this Agreement may be terminated on the date beginning on the first fiscal year for which funds are not appropriated or at the exhaustion of the appropriation. The Construction Manager may terminate this Agreement by providing written notice to the parties of such non-appropriation. All payment obligations of the Construction Manager will cease upon the date of termination. Notwithstanding the foregoing, the Construction Manager agrees that it will use its best efforts to obtain approval of necessary funds to continue the Agreement by taking appropriate action to request adequate funds to continue the Agreement.”

END SECTION 008000 - GENERAL REQUIREMENTS

SECTION 009300 - REFERENCE MATERIAL

The information described herein is believed to be accurate and representative, but no guarantee can be made that actual conditions encountered during construction will not vary or be changed.

1. GEOTECHNICAL REPORT (Boring Logs):

2. SURVEY:

These property surveys are included in the drawings as reference information.

Survey and their interpretation are to serve as the Contractor's basis in bidding excavation, grading requirements and other site related work. Contractors shall field verify all existing conditions and immediately report any discrepancies to the Owner's representative. Removal of unsuitable soils, if any, will be done under the direction of the Owner's Soils Engineer Consultant.

3. CADD FILES

4. WAGE DETERMINATION - No Federal Davis Bacon or State Prevailing Wage Rates Apply

5. USDA INFORMATION

END OF SECTION

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm

November 10, 2023

Delmarva Christian School
c/o Pennoni & Associates, Inc.
18720 Davidson Drive
Milton, Delaware 19968

Attn: Mr. Mark Davidson

Re: Report of Subsurface Exploration
Delmarva Christian Academy
Building and Pavement Expansion
Georgetown, Sussex County, Delaware

Ladies & Gentlemen:

Pursuant to your request, Geo-Technology Associates, Incorporated (GTA) has performed geotechnical exploration at the ***Delmarva Christian Academy*** Expansion project located in the Georgetown area of Sussex County, Delaware. The purpose of the subsurface exploration was to present our recommendations regarding foundation and slab support of the proposed building expansion, and earthwork, pavement and utility construction. A report regarding Stormwater Management (SWM) will be forwarded separately.

Unless Delmarva Christian School specifies otherwise, the samples collected as a part of the subsurface exploration will be disposed of after a period of 60 days from the date of this report. Thank you for the opportunity to be of assistance. If you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
GEO-TECHNOLOGY ASSOCIATES, INC.

Travis P. Caraway, P.E.
Associate

Gregory R. Sauter, P.E.
Vice President

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REPORT OF SUBSURFACE EXPLORATION

Delmarva Christian Academy

Building and Pavement Expansion
Georgetown
Sussex County, Delaware

November 10, 2023

Prepared For:

Delmarva Christian School
c/o Pennoni & Associates, Inc.
18072 Davidson Drive
Milton, Delaware 19968

Attn: Mr. Mark Davidson

Prepared By:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
21491 Baltimore Avenue, Unit 1
Georgetown, Delaware 19947
302-855-9761

GTA Job No: 31231819

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REPORT OF SUBSURFACE EXPLORATION
DELMARVA CHRISTIAN ACADEMY
GEORGETOWN
SUSSEX COUNTY, DELAWARE
NOVEMBER 2023

INTRODUCTION

A school expansion is proposed at the Delmarva Christian Academy in Georgetown, Delaware. Geo-Technology Associates, Inc. (GTA) was retained by Delmarva Christian School to perform a preliminary geotechnical exploration of the site. The scope of this study included field exploration, review a of site plan, limited laboratory testing and engineering analysis. The field exploration consisted of 22 Standard Penetration Test (SPT) borings performed within the development area. A preliminary site plan titled *Delmarva Christian* prepared by BGW Architects (BGW) and dated June 12, 2023 was referenced for this report. A report regarding the stormwater management (SWM) portion of the project will be submitted separately.

SITE CONDITIONS

Referring to the attached Figure No. 1, Site Location Plan, the site is situated at the northeast corner of Sussex Pines Road and Zoar Road in the Georgetown area of Sussex County, Delaware. The project site is situated within an irregular shaped parcel totaling approximately 54-acres and predominantly consists of the existing school and parking lot, sports fields, and mature woods. Residential lots border the site to the west, agricultural fields border the site to the south, and mature woods border the site to the north and east. Topographically, the property is relatively flat, with the ground surface at the exploration locations ranging from Elevation 45 to 47 Mean Sea Level (MSL), as determined by Pennoni Associates, Inc.

PROPOSED CONSTRUCTION

The proposed construction will consist of an approximately 87,000 square foot, mutli-story addition to the existing school building. Also proposed are new athletic fields, associated drive lanes and parking lots, SWM facility areas and ancillary buildings. The main building will have a new total footprint of approximately 150,000 square feet. A shallow spread foundation system and ground supported slabs are anticipated. Foundation loads provided by the structural engineer are as follows:

Area 1: Upper School Classroom Area

- Typical interior column loading at Classroom area
  - +/- 75kips to 80 kips
- Typical exterior column loading at Classroom area
  - +/- 38 kips to 40 kips
- Typical corner column loading at Classroom area
  - +/- 20 kips to 25 kips
- Typical Exterior Wall Loading
  - +/- 1.5 kips / ft to 2.0 kips / ft

Area 2: Upper School Gymnasium Area

- Typical exterior column loading at Gymnasium
  - +/- 70 kips
- Typical interior column loading at Gymnasium
  - +/- 85 kips
- Typical corner column loading at Gymnasium
  - +/- 40 kips
- Typical Exterior Wall Loading
  - +/- 2.5 kips / ft to 3.0 kips / ft

Area 3: Industrial Arts Building

- Typical exterior Column Loading
  - +/- 40 kips
- Typical corner Column Loading
  - +/- 20 kips to 25 kips
- Typical wall loading
  - +/- 1.0 kips / ft to 1.5 kips / ft

Area 4: Early Learning Center

- Typical Exterior Wall Loading (Bearing Wall)
  - +/- 2.0 kips / ft to 2.8 kips / ft
- Typical Interior Wall Loading (Bearing Wall)
  - +/- 1.8 kips / ft to 2.2 kips / ft

The building will be served by public water and sewer. While the grading scheme has not been established, GTA assumes that fill to cut on the order of one foot or so will be needed within the building pad and pavement areas to achieve final grades, with substantial cut anticipated for the SWM facility areas.

SITE GEOLOGY

According to the Geologic Map of the Harbeson Quadrangle, Delaware (2011) published by the Delaware Geological Survey, the study area is within the Coastal Plain Physiographic

Province. Coastal Plain sediments below the surficial deposits exposed in the site area were generally deposited in commonly estuarine environments of Tertiary geologic age. The Late Pliocene deposits are designated as the Beaverdam Formation and typically consist of "…very coarse sand with pebbles to silty clay. The predominant lithologies at the land surface are with to mottled light-gray and reddish-brown, silty to clayey, fine to coarse sand." Please review the referenced map for further details regarding this geologic unit.

SUBSURFACE EXPLORATION

The field exploration consisted of 22 Standard Penetration Test (SPT) borings, designated as B-1 through B-13, performed within the vicinity of the proposed building footprints and P-1 through P-9 located within the pavement areas. These borings were performed during September 2023, to depths of approximately 6 to 30 feet below the existing ground surface. An ATV mounted Geoprobe 7822 DT drill rig was used to drill the SPT borings.

The boring locations were performed at the approximate locations shown on the Exploration Location Plan, presented as Figure 2 in Appendix A. The exploration locations were selected by GTA and staked with elevations determined by Pennoni Associates, Inc. The exploration locations indicated on the plan should be considered approximate.

Standard Penetration Testing was performed in the SPT boreholes, with soil samples obtained at 2-foot intervals in the upper 10 feet and then at 5-foot intervals thereafter. Standard Penetration Testing involves driving a 2-inch O.D., 1 ⅜ -inch I.D. split-spoon sampler with a 140-pound hammer free-falling 30 inches. The SPT N-value, given as blows per foot (bpf), is defined as the total number of blows required to drive the sampler from the 6 to 18 inches below the sampling depth. Longer term water level readings were recorded one to seven days after completion. Borings were backfilled after completion of the water readings.

Samples obtained from the borings were returned to GTA's office for visual classification by GTA personnel. Selected samples recovered from the field exploration were submitted for limited laboratory analysis. The soil layers were classified in accordance with the Unified Soil Classification System (USCS) and American Association of State Highway and Transportation Officials (AASHTO) classification systems. Classifications provided on the logs are visual

descriptions, supplemented by available laboratory data. The exploration logs are presented in Appendix B. The logs represent our interpretation of the field data based on observation and limited soil classification tests. The interfaces indicated on the logs may be gradual.

SUBSURFACE CONDITIONS

The explorations generally confirm the description of subsurface conditions provided in the *SITE GEOLOGY* section of this report. The borings encountered a 5 to 18-inch thick topsoil layer, with the exception of Borings B-6 and B-7 which encountered a 7-inch thick pavement section. Below the topsoil, Borings B-3, B-5, and B-8 through B-10, encountered fill extending to depths of approximately 4 feet below the ground surface and consisted of Silty SANDs (USCS: SM; AASHTO: A-2). The densities of the fill were loose to medium dense based on SPT N-values of 6 to 20 bpf.

Beneath the topsoil/pavement section/fill layers, the explorations encountered native soils visually classified as consisting of Poorly-graded SANDs with Silt (USCS: SP-SM; AASHTO: A-2/A-3), Poorly-graded SANDs (SP; A-3), Silty SANDs (SM; A-2), and Clayey SANDs (SC; A-2-6/A-4/A-6). The relative densities of the granular soils were very loose to medium dense based on SPT N-values of 2 to 28 bpf.

Water was encountered at completion at depths of 6 to 10 feet below the ground surface, with exception of Explorations P-1 through P-9, which were dry to depths of 6 feet below the ground surface. Longer term water levels (recorded one to seven days after completion) were encountered at depths of 6 to 10 feet below the existing ground surface corresponding to approximate Elevation 36 to 39 Mean Sea Level (MSL) and averaging at Elevation 37½ MSL. Borings P-1 through P-9 were dry to 6 feet when long terms readings were taken.

The groundwater levels can be expected to fluctuate with seasonal changes, precipitation, and other factors such as development activity. Additionally, perched water conditions develop in granular soils overlying fine-grained and/or denser soils during the “wet season” and during heavy periods of precipitation. Please refer to the Idealized Subsurface Profiles provided in Appendix A and the exploration logs provided in Appendix B for further information.

LABORATORY TESTING

Selected samples obtained from the borings were tested for grain-size analysis, Atterberg Limits and natural moisture content. The grain-size analysis and Atterberg Limits testing were performed to identify the Unified Soil Classification System (USCS) and American Association of Highway and Transportation Officials (AASHTO) designations for the soil. The results of testing are as follows:

SUMMARY OF LABORATORY TESTING

EXPLORATION NO.	DEPTH (FT.)	USCS CLASSIFICATION	AASHTO CLASSIFICATION	LL (%)	PI (%)	NM (%)
B-2	2 – 4	Clayey SAND (SC)	A-4(0)	23	9	18.5
B-10	6 – 8	Clayey SAND (SC)	A-2-6(1)	30	13	25.5
P-4	1 – 4	Clayey SAND (SC)	A-4(1)	26	10	8.7

Note: LL=Liquid Limit PI=Plastic Index NP=Non-plastic NM=Natural Moisture Content

A composite, near-surface sample was tested for moisture-density relationships in accordance with the Modified Proctor (ASTM D-1557) method for use in evaluating the suitability of these soils for reuse as fill. The sample was also subjected to California Bearing Ratio (CBR) testing for use in evaluation of pavement subgrade supporting quality. Results of these tests are summarized in the following table.

SUMMARY OF COMPACTION and CBR DATA
(ASTM D 1557, the Modified Proctor; ASTM D 1883, CBR)

EXPLORATION NO.	DEPTH (FT)	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE (%)	NATURAL MOISTURE (%)	CBR AT 95% COMPACTION (%)
P-4	1 – 4	124.4	10.7	8.7	10.1

Please refer to the laboratory test results included within Appendix C for additional information.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of this study, it is our opinion that construction of the proposed improvements are feasible, given that the geotechnical recommendations are followed and that the standard level of care is maintained during construction. GTA's preliminary recommendations are provided in the following paragraphs.

Earthwork

Before the placement of compacted fill, areas below proposed foundations, slabs, and pavements should be stripped to remove topsoil and soft materials. After stripping, subgrade areas should be proof-rolled with a loaded tandem-axle dump truck, performed as recommended by GTA. No fill should be placed until the geotechnical engineer approves the subgrade. Wet soils near surface grade will result in poor trafficability. Positive drainage should be maintained during construction.

Most near surface on-site soils beneath the topsoil similar to the materials tested are considered suitable for reuse as structural fill material. Excavated site materials conforming to SP, SP-SM, SC or SM classifications will be suitable for reuse as structural utility backfill and in structural areas of earthwork construction. The moisture content of the tested bulk sample within two percent of the optimum moisture content. At this indicated moisture level, granular site materials similar to the sample tested will likely require limited, if any, moisture adjustment. During wet weather or when excavating below or near groundwater, delays and expense will likely be associated with reducing soil moistures to acceptable levels. Also, chemical amendment (e.g., Portland cement or Quicklime) may be considered to stabilize wet soil subgrades. The need for chemical amendment to facilitate drying and/or stabilization can best be evaluated by GTA in the field at the time of construction.

For utility and site earthwork construction, the success of these operations will be largely dependent upon the weather conditions at the time of the earthwork construction. Summer construction season is recommended to reduce the premium cost for drying. A contingency should be established for moisture adjustments and importing suitable materials. If the work is performed during wet weather, offsite borrow may be required to complete the earthwork construction.

Deeper excavations, such as for sewer utility and SWM pond installations, may encounter groundwater. Consideration must be given to dewatering and stability of excavated slopes. Contractors should provide adequate dewatering and earth support systems in utility trench excavations. Utility pipe systems below pavement and other structural areas should be backfilled using controlled, compacted fill. The backfill should be constructed as described in our site grading

recommendations. Lift thickness should be reduced to 4 inches when compacting with lightweight equipment around structures.

Off-site borrow, if required, should meet Unified Soil Classification System (USCS) designation SM, SP, SW, GM, GP, or GW and be approved by GTA. All fills should be constructed in maximum 8-inch thick loose lifts and be compacted to the following specifications:

COMPACTION SPECIFICATIONS

Structure / Fill Location	Compaction / Moisture Specification
Below foundations, floor slab subgrades and within wall backfill and pavement areas	95% of ASTM D 1557 Moisture: ± 3% of optimum
Lawn or unimproved areas	90% of ASTM D 1557 Moisture: optimum to ± 3% of optimum

A full-time soils-technician under guidance of GTA should observe fill construction. Compactive effort should be verified by in-place density testing.

Foundations

Based upon the exploration data, it is GTA's opinion that the proposed building expansion may be supported on firm soils using shallow spread footings designed for a maximum net allowable bearing pressure of 1,500 pounds per square foot (psf) for building additions and 2,000 psf for stand-alone buildings. For the building expansion at junctures between the existing building and additions, new footings should be lowered to match existing footing elevations. Minimum widths for wall footings of 16 inches and column footings of 24 inches are recommended. Settlement of 1-inch total and ½-inch differential over a 50-foot horizontal span is estimated considering the provided preliminary building loads. Exterior footings should be founded a minimum of 24 inches below the final exterior grades to provide protection from frost action.

Detailed foundation evaluations should be performed in each footing excavation prior to the placement of reinforcing steel or concrete. These evaluations should be performed by a representative of GTA to confirm that the allowable soil bearing capacity is available. The

foundation bearing surface evaluations should be performed using a combination of visual observation, comparison with the borings, hand-rod probing, and Dynamic Cone Penetrometer (DCP) testing. Footings should be concreted on the day they are excavated. If very loose or unsuitable fill materials are encountered, the footing excavations should be undercut and the subgrade should be reestablished with AASHTO No. 57 crushed stone or in accordance with GTA's recommendations in the field at the time of construction.

Floor Slabs

The ground floors should be designed as concrete slab-on-grade. GTA recommends that the concrete floor slabs supported on grade be founded on a four-inch thick open-graded stone layer covered with a polyethylene vapor retarder to interrupt the rise of moisture through the slab. Natural and compacted fill subgrades for support of the floor slabs should be tested to verify stability and compaction in accordance with GTA's earthwork recommendations prior to placement of concrete. Control joints should be provided to control shrinkage cracking of the concrete floor system. Isolation joints should be present at the location of walls, columns, and footings to allow for differential movement. A modulus of subgrade reaction value of 150 psi per inch is recommended for the design of the building slabs.

Pavements

Pavement sections should be designed based on anticipated subgrade conditions and traffic intensity. Laboratory testing of selected site soils indicated a CBR value of approximately 10 percent for the Clayey SAND (AASHTO A-4(1)) sample tested. The CBR value is based upon a relative compaction of 95 percent of maximum dry density (Modified Proctor, ASTM D-1557). Based upon the CBR value and the field conditions encountered at the borings, the site soils tested are considered to be generally good for supporting standard pavement sections.

Based on GTA's experience with similar projects, construction traffic is likely to be more significant for the design of the pavements. The pavement section thickness should be designed to reflect construction traffic and the subgrade supporting quality of the site soils. It is likely that the majority of the on-site soils will be suitable for the support of the pavement thickness sections indicated in the following paragraphs. However, subgrade materials should be carefully evaluated

prior to graded aggregate base placement and paving. Therefore, GTA recommends that the upper 12 inches of roadway subgrade be constructed of fill with the following characteristics:

PAVEMENT SUBGRADE SPECIFICATIONS

Liquid Limit	35 or less
Plasticity Index	10 or less
Maximum Dry Density	105 pcf or greater
California Bearing Ratio	10 or greater

Prior to construction of pavement sections, the pavement subgrade should be proof-rolled with a loaded tandem-axle dump truck under the observation of GTA to verify stability. Unstable or unsuitable soils should be over-excavated to a stable bearing layer. The subgrade may be re-established with approved, controlled, compacted stabilized fill. A contingency for undercutting and replacement of unsuitable materials should be provided. During prevailing wet weather conditions, the roadway subgrade may be amended using Portland cement to stabilize the roadway subgrade. GTA recommends the top 12 inches of subgrade be amended with approximately 5 to 6 percent Portland cement (Type I/II), tilled and compacted per PCA specifications. Additional laboratory testing should be performed to confirm the quantity of Portland cement at the time of construction.

For driveway and parking lot pavement construction, it is recommended that two different pavement sections be utilized to reduce the potential for pavement failures during construction. The heavy-duty pavement section can be constructed for the main driveway connecting the parking lots to the main entrance lane to Sussex Pine Road. The standard-duty pavement section can be constructed in the parking lots. It is recommended that construction traffic be limited to the heavy-duty pavement sections. The recommended preliminary pavement sections are as follows:

FLEXIBLE PAVEMENT

Pavement Components	Standard-Duty	Heavy-Duty
Bituminous Concrete Surface Course (Type C; 9.5 mm Superpave)	1½ inches	1½ inches
Bituminous Concrete Intermediate Course (Type C)*	--	1¼ inches
Bituminous Concrete Base Course (Type B; 12.5 or 19 mm Superpave)	3 inches	3½ inches
Graded Aggregate Base Course (Type B Crusher Run)	6 inches	8 inches
Approved Subgrade	12 inches	12 inches

*Placed immediately following Base Course placement.

RIGID PAVEMENT

Pavement Components	Standard-Duty	Heavy-Duty
Portland Cement Concrete*	6 inches	7 inches
Graded Aggregate Base Course (Type B Crusher Run)	4 inches	4 inches
Approved Subgrade	12 inches	12 inches

*f'c= 4,000 psi concrete provided with 7% air-entrainment; control joints, isolation joints, load transfer devices, and reinforcement as required.

When pavement areas are established to approximate pavement subgrade, the pavement subgrade material should be observed by GTA to allow for additional recommendations based upon subgrade conditions observed at the time of construction. All pavement materials and construction should conform to the State of Delaware, Department of Transportation (DelDOT), STANDARD SPECIFICATIONS, latest edition, and the Town of Georgetown standards, as applicable.

LIMITATIONS

This report, including all supporting exploration logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by GTA in connection with this project, has been prepared for the exclusive use of Delmarva Christian School pursuant to the agreements between GTA and Delmarva Christian School dated July 11, 2023 and in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is given herein. Use and reproduction of this report by any other person without

the expressed written permission of GTA and Delmarva Christian School is unauthorized and such use is at the sole risk of the user.

The analysis and preliminary recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test borings indicate soil conditions only at specific locations and times and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between test boring locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc.

The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client. This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

31231819 **GEO-TECHNOLOGY ASSOCIATES, INC.**

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

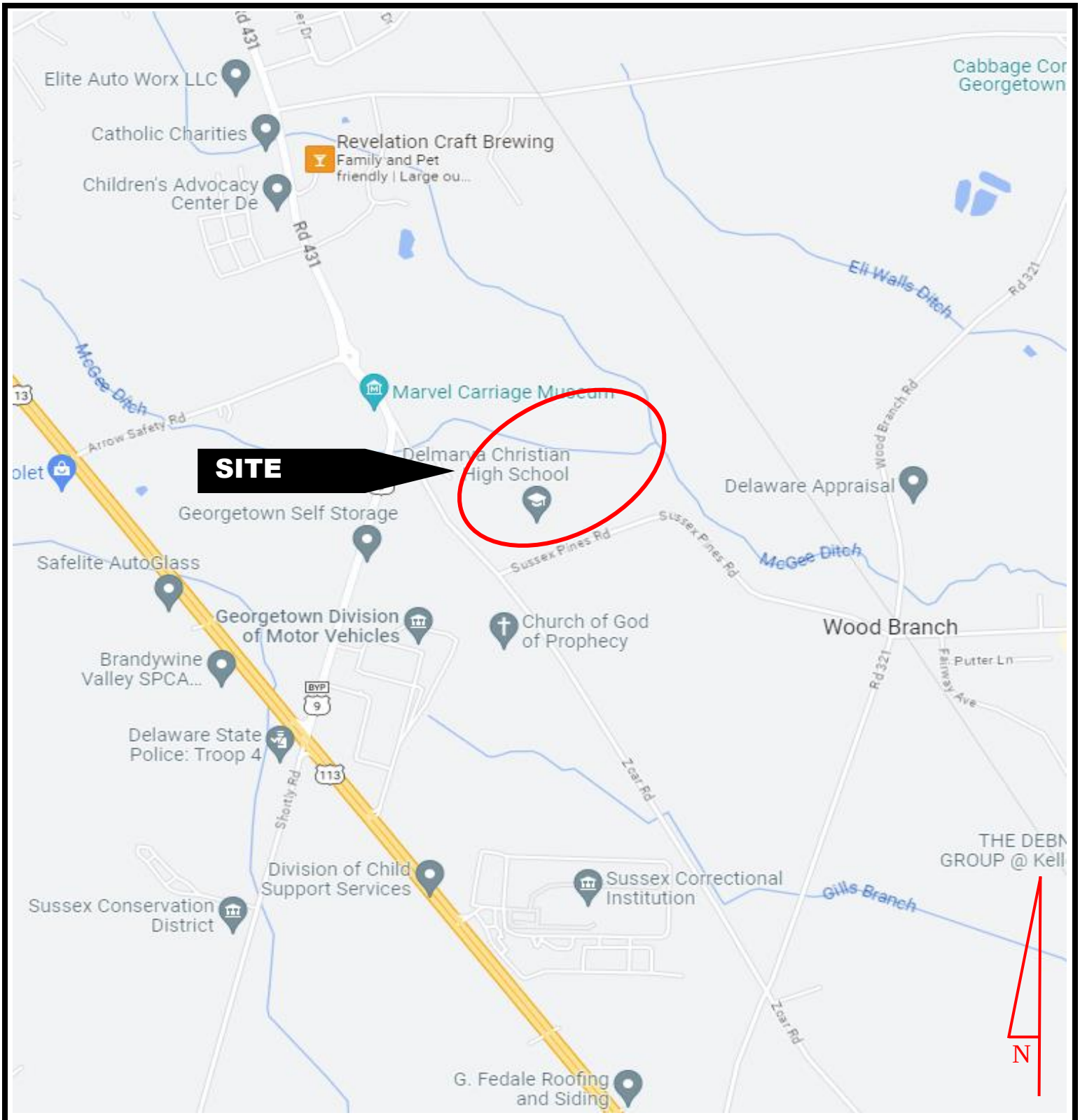
While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX A

FIGURES



Site Location Plan taken from Google Maps

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
21491 Baltimore Avenue
Georgetown, Delaware 19947
(302) 855-9761

Site Location Plan
Delmarva Christian Academy
Georgetown, Delaware

SCALE	DATE	DRAWN BY	DESIGN BY	REVIEW BY	JOB NO.
NTS	October 2023	GTA	Google Maps	GRS	31231819

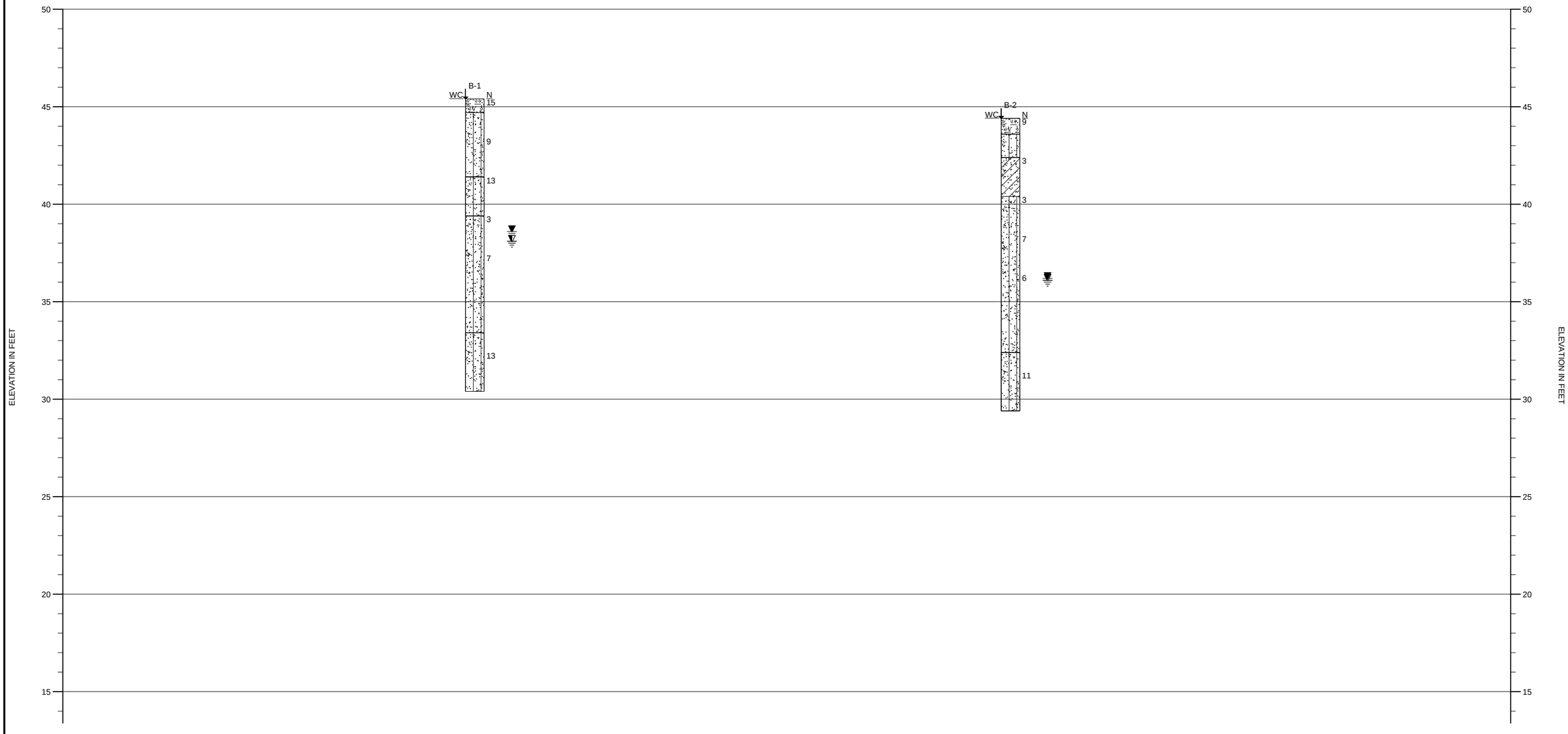
Exploration Location Plan taken from Google Earth and preliminary archetectural design plans titled *Delmarva Christian* prepared by BGW Architects and dated September 12, 2023.

Exploration Location

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
21491 Baltimore Avenue, Unit 1
Georgetown, Delaware 19947
(302) 855-9761

Exploration Location Plan
Delmarva Christian Academy
Georgetown, Delaware

SCALE 11X17	DATE	DRAWN BY	DESIGN BY	REVIEW BY	JOB NO.	Figure
1" ~ 150'	November 2023	GTA	BGW	GRS	31231819	2



Symbol Description

- Topsoil
- SM - Silty Sand
- SP-SM - Poorly Graded Sand with Silt
- SC - Clayey Sand
- Approximate horizontal location of exploration
- Water table during drilling
- Water table at completion
- Water table at 3rd check

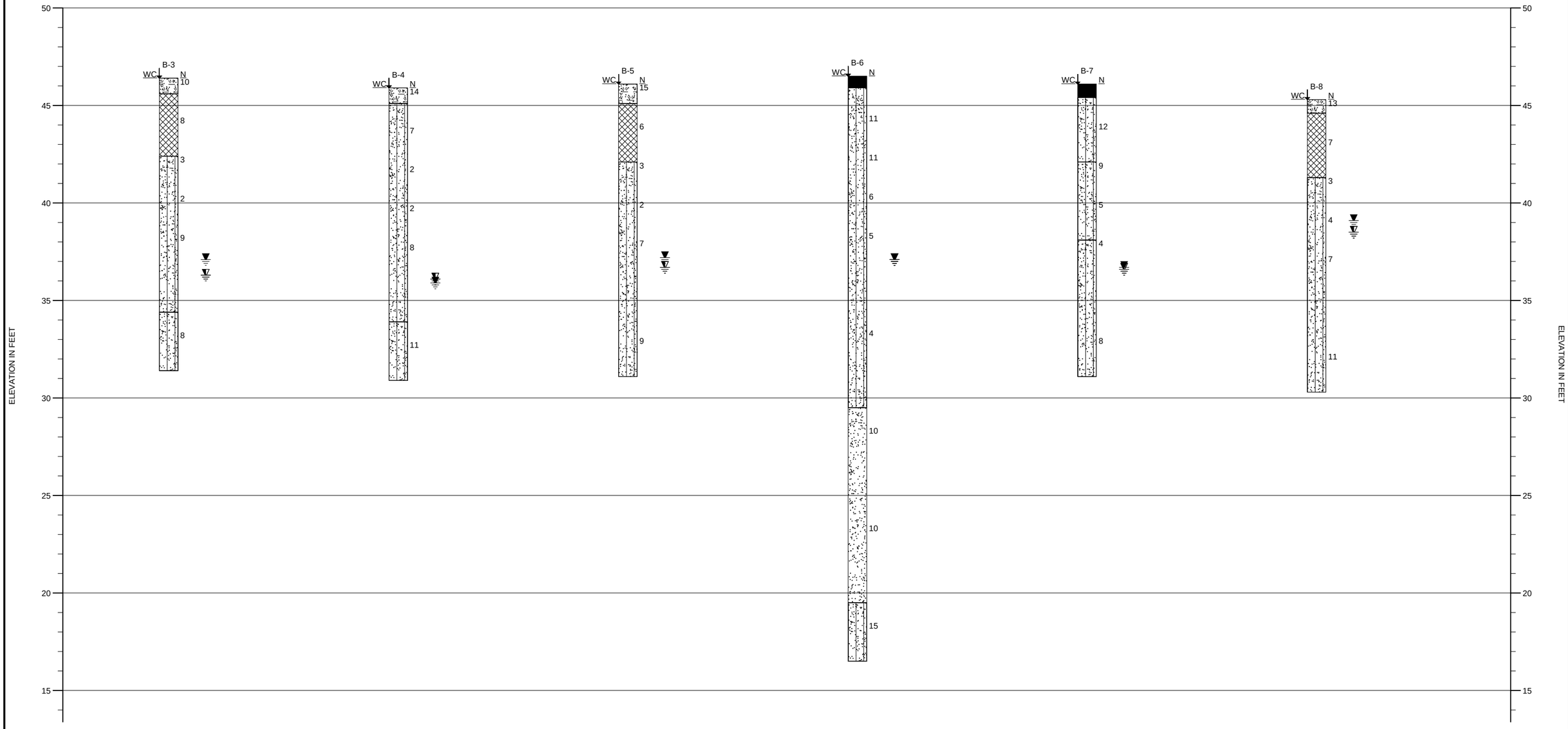
Geo-Technology Associates, Inc.

SUBSURFACE PROFILE

VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023

Delmarva Christian Academy
Georgetown, Delaware

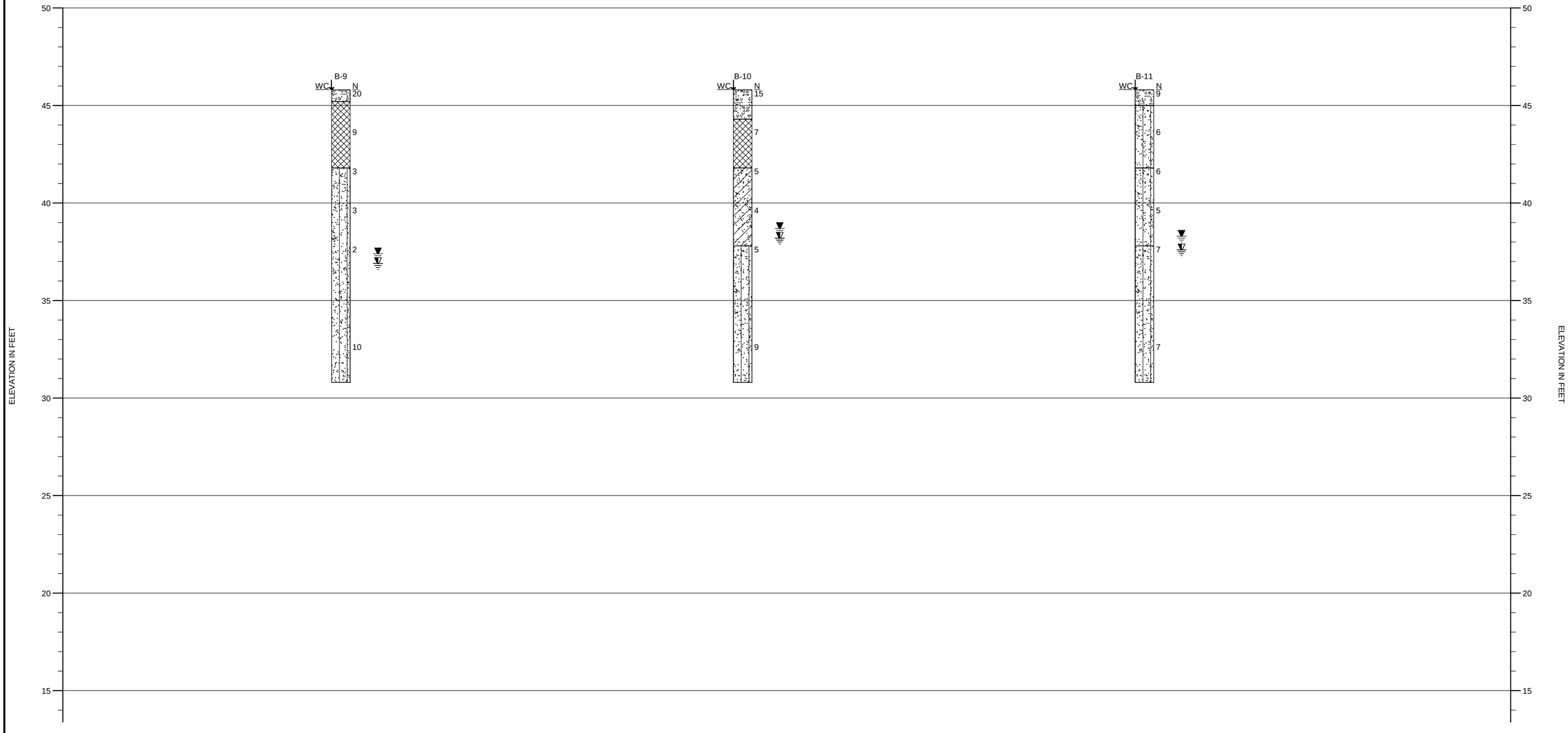
PROJECT NO. 31231819 | FIGURE 3



Symbol Description

- Topsoil
- Existing Fill
- SM - Silty Sand
- SP-SM - Poorly Graded Sand with Silt
- Paving
- SP - Poorly Graded Sand
- Approximate horizontal location of exploration
- Water table during drilling
- Water table at completion
- Water table at 3rd check

Geo-Technology Associates, Inc.			
SUBSURFACE PROFILE			
VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023
Delmarva Christian Academy Georgetown, Delaware			
PROJECT NO. 31231819		FIGURE 4	



Symbol Description

- Topsoil
- Existing Fill
- SM - Silty Sand
- SC - Clayey Sand
- SP-SM - Poorly Graded Sand with Silt
- Approximate horizontal location of exploration
- Water table during drilling
- Water table at completion
- Water table at 3rd check

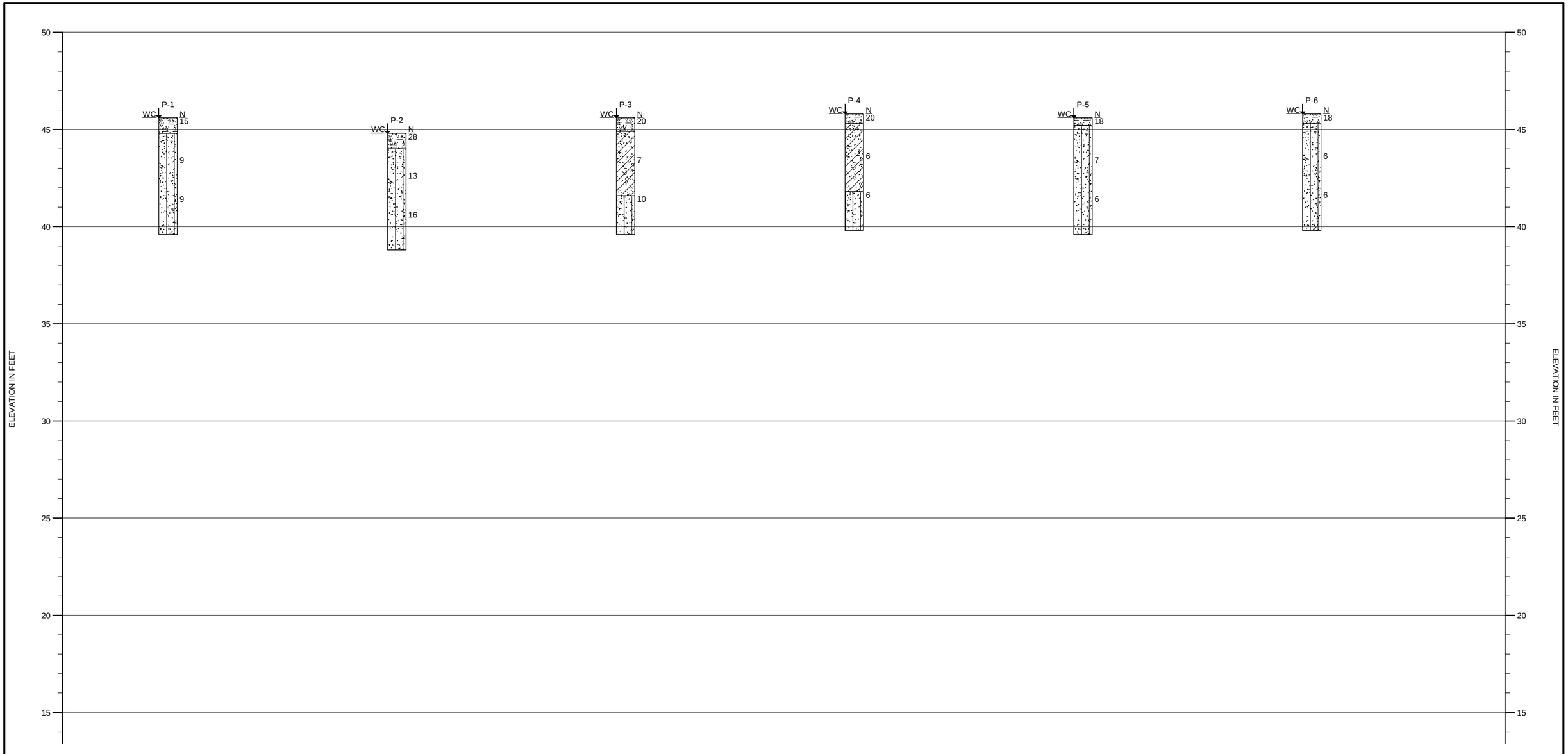
Geo-Technology Associates, Inc.

SUBSURFACE PROFILE

VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023

Delmarva Christian Academy
Georgetown, Delaware

PROJECT NO. 31231819 | FIGURE 5



Symbol Description

- Topsoil
- SM - Silty Sand
- SC - Clayey Sand
- ↓ Approximate horizontal location of exploration

Geo-Technology Associates, Inc.			
SUBSURFACE PROFILE			
VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023
Delmarva Christian Academy Georgetown, Delaware			
PROJECT NO. 31231819			FIGURE 6

APPENDIX B
EXPLORATION DATA

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)				SYMBOLS GRAPHIC	SYMBOLS LETTER
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			GW
					GP
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			GM
					GC
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			SW
					SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			SM
					SC
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILT OR CLAY (<15% RETAINED ON THE NO. 200 SIEVE) SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED ON THE NO. 200 SIEVE) SANDY OR GRAVELLY SILT OR CLAY (>30% RETAINED ON THE NO. 200 SIEVE)	SILTS AND LEAN CLAYS LIQUID LIMIT LESS THAN 50			ML
					CL
					OL
		ELASTIC SILTS AND FAT CLAYS LIQUID LIMIT GREATER THAN 50			MH
					CH
					OH
HIGHLY ORGANIC SOILS					PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS WHICH CONTAIN AN ESTIMATED 5 TO 15% FINES BASED ON VISUAL CLASSIFICATION OR BETWEEN 5 AND 12% FINES BASED ON LABORATORY TESTING; AND FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSS-HATCHED AREA. FINE-GRAINED SOILS ARE CLASSIFIED AS ORGANIC (OL OR OH) WHEN ENOUGH ORGANIC PARTICLES ARE PRESENT TO INFLUENCE ITS PROPERTIES. LABORATORY TEST RESULTS ARE USED TO SUPPLEMENT SOIL CLASSIFICATION BY THE VISUAL-MANUAL PROCEDURES OF ASTM D 2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

	DESCRIPTION		GRAPHIC SYMBOLS
ADDITIONAL DESIGNATIONS	TOPSOIL		
	MAN MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATIONS	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" OF PENETRATION OR LESS, AUGER PENETRABLE	

COARSE-GRAINED SOILS
(GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

FINE-GRAINED SOILS
(SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SOIL SAMPLE	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	▽
UPON COMPLETION OF DRILLING	▼
24 HOURS AFTER COMPLETION	▼

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF BORING NO. B-1

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	7.3		6.8
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **7.3**
GROUND SURFACE ELEVATION: **45.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.4	0	TS		Topsoil: 8 inches	
1	0.0	24	6-7-8-7	15	44.7		SM		Brown-gray, moist, loose to medium dense, Silty SAND	
2	2.0	20	3-4-5-8	9						
3	4.0	24	5-5-8-7	13	41.4		SP-SM		Gray, moist, medium dense, Poorly-graded SAND with Silt	
4	6.0	10	2-2-1-2	3	39.4	6	SM		Gray, moist to wet, very loose to loose, Silty SAND	▽
5	8.0	24	3-4-3-4	7						
					33.4	12	SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
6	13.0	24	7-8-5-4	13	30.4				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. B-1

LOG OF BORING NO. B-2

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.3		8.2
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.3**
GROUND SURFACE ELEVATION: **44.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					44.4	0				
1	0.0	22	4-5-4-4	9	43.6		TS		Topsoil: 10 inches	
							SM		Gray, moist, loose, Silty SAND	
2	2.0	20	3-2-1-2	3	42.4		SC		Gray, moist, very loose, Clayey SAND	
3	4.0	20	2-2-1-2	3	40.4		SM		Gray, moist to wet, very loose to loose, Silty SAND	
4	6.0	18	3-3-4-3	7		6				
5	8.0	24	4-3-3-2	6						
					32.4	12	SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
6	13.0	24	5-6-5-4	11	29.4					
									Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. B-2

LOG OF BORING NO. B-3

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	10.1		9.3
DATE:	9/7/23		9/8/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **10.1**
GROUND SURFACE ELEVATION: **46.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.4	0				
1	0.0	22	7-5-5-7	10	45.6		TS		Topsoil: 10 inches	
							FILL		Brown, moist, loose, Silty SAND (Fill)	
2	2.0	20	3-4-4-3	8						
					42.4					
3	4.0	20	2-2-1-2	3			SM		Gray-tan, moist to wet, very loose to loose, Silty SAND	
4	6.0	18	1-1-1-2	2		6				
5	8.0	24	4-4-5-4	9						▽
					34.4	12				
							SP-SM		Gray-tan, wet, loose, Poorly-graded SAND with Silt	
6	13.0	20	5-4-4-4	8						
					31.4				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. B-3

LOG OF BORING NO. B-4

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.8		10.0
DATE:	9/7/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.8**
GROUND SURFACE ELEVATION: **45.9**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	20	6-7-7-6	14	45.9 45.1	0	TS SM		Topsoil: 10 inches Brown-gray, moist to wet, very loose to medium dense, Silty SAND	▽
2	2.0	18	4-3-4-3	7						
3	4.0	20	2-1-1-2	2		6				
4	6.0	18	3-1-1-2	2						
5	8.0	16	3-3-5-4	8						
					33.9	12	SP-SM		Tan, wet, medium dense, Poorly-graded SAND with Silt	
6	13.0	24	4-6-5-3	11						
					30.9				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
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Georgetown, DE 19947

LOG OF BORING NO. B-4

LOG OF BORING NO. B-5

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.4		8.9
DATE:	9/7/23		9/8/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.4**
GROUND SURFACE ELEVATION: **46.1**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	18	7-7-8-7	15	46.1 45.1	0	TS		Topsoil: 12 inches	
							FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	20	3-3-3-3	6						
					42.1					
3	4.0	18	3-2-1-2	3			SM		Gray-tan, moist to wet, very loose to loose, Silty SAND	
4	6.0	20	2-1-1-2	2		6				
5	8.0	18	3-4-3-3	7						▽
						12				
6	13.0	18	4-5-4-4	9						
					31.1				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-5

LOG OF BORING NO. B-6

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.4		9.4
DATE:	9/12/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/12/2023**
DATE COMPLETED: **9/12/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.4**
GROUND SURFACE ELEVATION: **46.5**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.5	0			Pavement Section: 7 inches	
					45.9		SP-SM		Brown-gray-tan, moist to wet, very loose to medium dense, Poorly-graded SAND with Silt	
1	2.0	12	5-5-6-7	11						
2	4.0	20	2-5-6-6	11		6				
3	6.0	20	3-4-2-2	6						
4	8.0	20	2-3-2-2	5						▽
						12				
5	13.0	24	2-2-2-2	4						
					29.5		SP		Gray, wet, loose, Poorly-graded SAND	
6	18.0	24	3-4-6-6	10		18				
7	23.0	24	3-5-5-4	10		24				
					19.5		SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
8	28.0	24	6-7-8-8	15						
					16.5	30			Bottom of hole 30 feet	
						36				

NOTES:

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LOG OF BORING NO. B-6

LOG OF BORING NO. B-7

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.5		9.4
DATE:	9/12/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/12/2023**
DATE COMPLETED: **9/12/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.5**
GROUND SURFACE ELEVATION: **46.1**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.1	0			Pavement Section: 7 inches	
					45.4		SP-SM		Tan, moist, medium dense, Poorly-graded SAND with Silt	
1	2.0	20	3-5-7-6	12						
					42.1		SM		Gray-tan, moist, loose, Silty SAND	
2	4.0	24	4-4-5-5	9		6				
3	6.0	24	2-3-2-2	5						
					38.1		SP-SM		Gray, moist to wet, very loose to loose, Poorly-graded SAND with Silt	▽
4	8.0	20	3-2-2-2	4		12				
5	13.0	24	3-4-4-5	8						
					31.1				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-7

LOG OF BORING NO. B-8

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	6.8		6.2
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **6.8**
GROUND SURFACE ELEVATION: **45.3**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.3	0	TS		Topsoil: 8 inches	
1	0.0	20	8-7-6-7	13	44.6		FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	22	5-4-3-4	7						
					41.3		SM		Gray-brown, moist to wet, very loose to medium dense, Silty SAND	
3	4.0	18	3-1-2-1	3		6				▽
4	6.0	20	2-3-1-2	4						
5	8.0	22	3-4-3-3	7						
						12				
6	13.0	24	4-5-6-4	11						
					30.3				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-8

LOG OF BORING NO. B-9

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.9		8.4
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.9**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.8	0				
1	0.0	20	7-10-10-7	20	45.2		TS		Topsoil: 7 inches	
							FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	18	3-4-5-4	9						
					41.8					
3	4.0	20	2-1-2-2	3			SM		Gray-brown, moist to wet, very loose to loose, Silty SAND	
4	6.0	18	2-2-1-2	3		6				
5	8.0	24	2-1-1-2	2						▽
						12				
6	13.0	24	4-4-6-4	10						
					30.8				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-9

LOG OF BORING NO. B-10

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	7.6		7.1
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **7.6**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	20	7-8-7-7	15	45.8	0	TS		Topsoil: 18 inches	
					44.3		FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	22	5-4-3-4	7						
3	4.0	22	2-2-3-2	5	41.8		SC		Gray-brown, moist to wet, very loose to loose, Clayey SAND	
4	6.0	16	2-2-2-2	4		6				▽
5	8.0	20	2-3-2-2	5	37.8		SM		Tan-gray, wet, loose, Silty SAND	
						12				
6	13.0	24	4-5-4-4	9						
					30.8				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-10

LOG OF BORING NO. B-11

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.2		7.5
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.2**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	3-4-5-4	9	45.8	0	TS		Topsoil: 10 inches	
					45.0		SM		Brown-gray, moist, loose, Silty SAND	
2	2.0	24	2-3-3-2	6						
					41.8		SP-SM		Gray, moist, loose, Poorly-graded SAND with Silt	
3	4.0	18	3-3-3-3	6		6				
4	6.0	22	3-3-2-3	5						▽
					37.8		SM		Gray, moist to wet, loose, Silty SAND	
5	8.0	24	3-3-4-3	7						
						12				
6	13.0	24	5-4-3-5	7						
					30.8				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
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LOG OF BORING NO. B-11

LOG OF BORING NO. B-12

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.2		9.0
DATE:	9/12/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/12/2023**
DATE COMPLETED: **9/12/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.2**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	14	3-3-4-3	7	45.6 44.9	0	TS SM		Topsoil: 8 inches Brown, moist, loose, Silty SAND	
2	2.0	20	4-3-3-2	6	43.6		SP-SM		Gray-tan, moist to wet, very loose to loose, Poorly-graded SAND with Silt	
3	4.0	20	2-1-2-2	3		6				
4	6.0	24	2-3-2-3	5						
5	8.0	24	1-2-2-1	4						▽
						12				
6	13.0	20	1-1-3-4	4						
						18				
7	18.0	24	2-2-4-5	6						
					23.6		SP		Gray, wet, medium dense, Poorly-graded SAND	
8	23.0	24	6-8-6-6	14		24				
					18.6		SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
9	28.0	24	5-9-7-7	16						
					15.6	30			Bottom of hole 30 feet	
						36				

NOTES:

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LOG OF BORING NO. B-12

LOG OF BORING NO. B-13

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.5		7.8
DATE:	9/7/23		9/8/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.5**
GROUND SURFACE ELEVATION: **46.3**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.3	0				
1	0.0	20	4-6-6-5	12	45.5		TS		Topsoil: 10 inches	
							SM		Brown-gray, moist to wet, loose to medium dense, Silty SAND	▽
2	2.0	18	4-4-5-6	9						
3	4.0	20	3-3-4-3	7		6				
4	6.0	18	2-2-3-2	5						
5	8.0	20	3-5-3-3	8						
					34.3	12	SP-SM		Tan, wet, loose, Poorly-graded SAND with Silt	
6	13.0	24	6-5-4-4	9						
					31.3				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-13

LOG OF BORING NO. P-1

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	7-7-8-7	15	45.6 44.8	0	TS SM		Topsoil: 10 inches Brown-gray, moist, loose to medium dense, Silty SAND AASHTO: A-2	
2	2.0	18	4-4-5-4	9						
3	4.0	20	5-4-5-8	9						
					39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

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LOG OF BORING NO. P-1

LOG OF BORING NO. P-2

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **44.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	15-20-8-7	28	44.8 44.0	0	TS SM		Topsoil: 10 inches Brown-gray, moist, medium dense, Silty SAND AASHTO: A-2	
2	2.0	20	6-5-8-7	13						
3	4.0	24	7-7-9-8	16						
					38.8	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

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LOG OF BORING NO. P-2

LOG OF BORING NO. P-3

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.6	0	TS		Topsoil: 8 inches	
1	0.0	24	10-14-6-6	20	44.9		SC		Brown, moist, loose to medium dense, Clayey SAND AASHTO: A-4(1)	
2	2.0	24	6-4-3-7	7						
					41.6		SM		Gray, moist, loose, Silty SAND AASHTO: A-2	
3	4.0	24	8-5-5-4	10	39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

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LOG OF BORING NO. P-4

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	4-10-10-7	20	45.8 45.3	0	TS SC		Topsoil: 6 inches Gray-brown, moist, loose to medium dense, Clayey SAND AASHTO: A-4(1)	
2	2.0	24	3-3-3-3	6						
3	4.0	24	2-3-3-2	6	41.8 39.8	6	SM		Gray, moist, loose, Silty SAND AASHTO: A-2	
									Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-4

LOG OF BORING NO. P-5

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	5-9-9-8	18	45.6 45.2	0	TS SM		Topsoil: 5 inches Brown-gray, moist, loose to medium dense, Silty SAND AASHTO: A-2	
2	2.0	24	3-3-4-4	7						
3	4.0	24	3-3-3-2	6						
					39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-5

LOG OF BORING NO. P-6

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	4-8-10-11	18	45.8 45.3	0	TS SM		Topsoil: 6 inches Brown-gray, moist, loose to medium dense, Silty SAND AASHTO: A-2	
2	2.0	24	4-3-3-4	6						
3	4.0	24	3-3-3-3	6						
					39.8	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-6

LOG OF BORING NO. P-7

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.6	0				
1	0.0	22	3-3-4-3	7	44.6		TS		Topsoil: 12 inches	
							SM		Brown-gray, moist, loose, Silty SAND AASHTO: A-2	
2	2.0	18	2-3-4-2	7						
3	4.0	20	3-3-4-3	7						
					39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-8

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/8/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/8/2023**
DATE COMPLETED: **9/8/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **46.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.4	0				
1	0.0	20	3-4-3-6	7	45.4		TS		Topsoil: 12 inches	
							SM		Brown-tan, moist, loose, Silty SAND AASHTO: A-2	
2	2.0	18	4-4-3-4	7						
3	4.0	16	2-2-3-2	5						
					40.4	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-8

LOG OF BORING NO. P-9

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/8/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/8/2023**
DATE COMPLETED: **9/8/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **46.7**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	22	3-4-6-7	10	46.7 45.9	0	TS SM		Topsoil: 10 inches Brown-gray, moist, loose, Silty SAND AASHTO: A-2	
2	2.0	20	4-5-4-3	9						
3	4.0	18	3-3-2-1	5						
					40.7	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

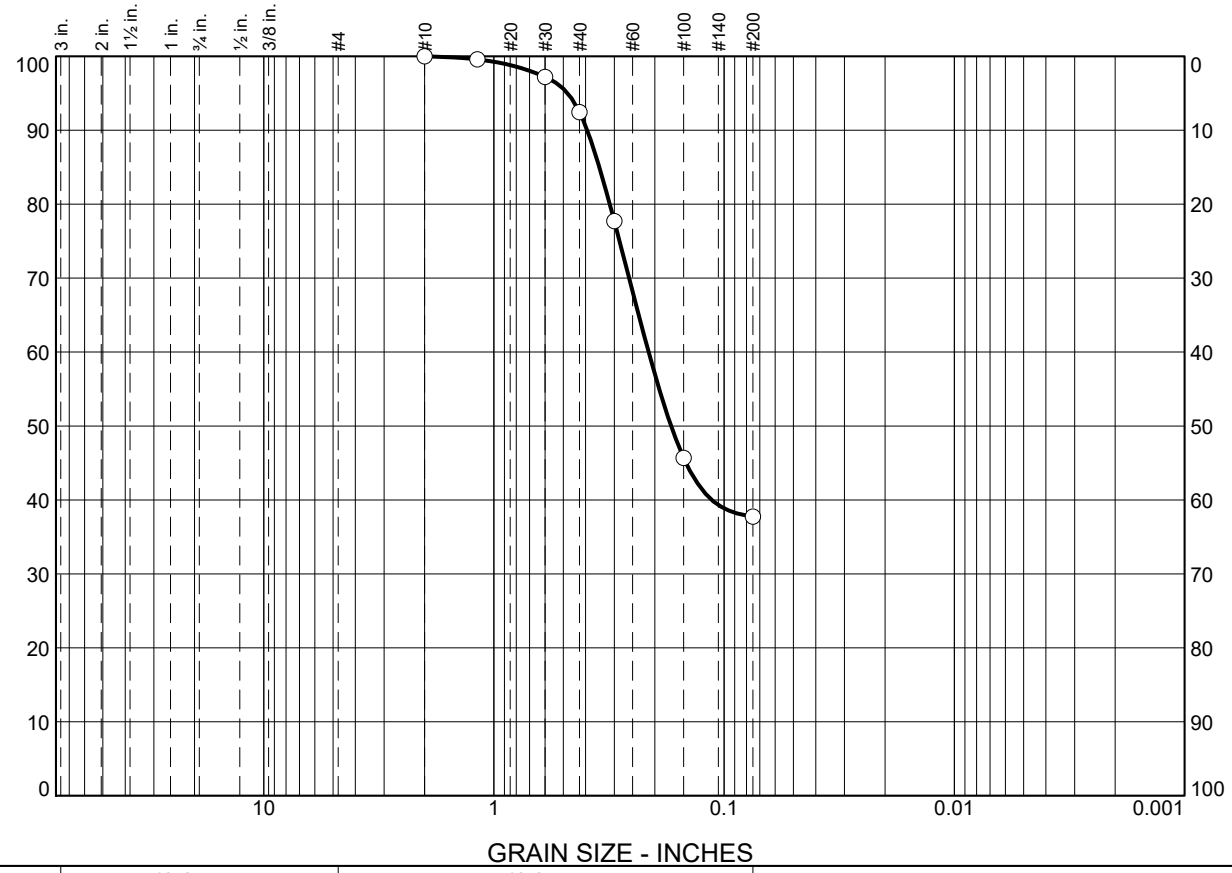
NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-9

APPENDIX C
LABORATORY DATA

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.0	7.5	54.7	37.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.6		
#30	97.2		
#40	92.5		
#50	77.7		
#100	45.7		
#200	37.8		

* (no specification provided)

Soil Description

Gray, Clayey SAND

Atterberg Limits

PL= 14 LL= 23 PI= 9 NM= 18.5

Coefficients

D_{90}= 0.3936 D_{85}= 0.3483 D_{60}= 0.2128
D_{50}= 0.1700 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(0)

Remarks

Pocket Penetrometer Read: 0.50 tsf

Source of Sample: B-2 **Depth:** 2.0-4.0 feet
Sample Number: S-2

Date: 9/11/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

Client: Delmarva Christian School
Project: Delmarva Christian Academy

Project No: 31231819 **Figure**

Tested By: E. Sammler **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.3	3.8	62.3	33.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.7		
#16	99.3		
#30	98.1		
#40	95.9		
#50	92.3		
#100	57.4		
#200	33.6		

* (no specification provided)

Soil Description

Gray-brown, Clayey SAND

Atterberg Limits

PL= 17 LL= 30 PI= 13 NM= 25.5

Coefficients

D_{90}= 0.2784 D_{85}= 0.2470 D_{60}= 0.1576
D_{50}= 0.1274 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

Pocket Penetrometer Read: 0.25 tsf

Source of Sample: B-10 **Depth:** 6.0-8.0 feet
Sample Number: S-4 **Date:** 9/6/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

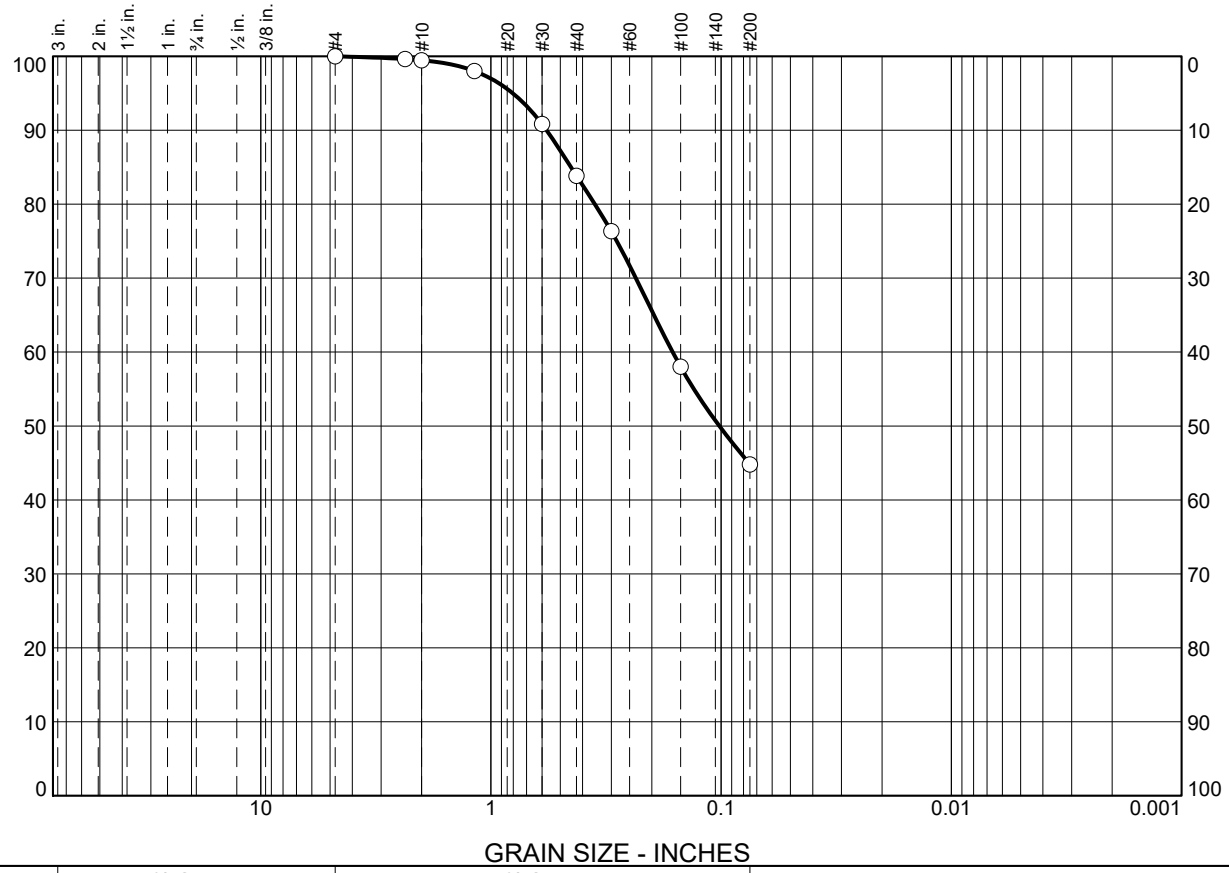
Client: Delmarva Christian School
Project: Delmarva Christian Academy

Project No: 31231819 **Figure**

Tested By: E. Sammler **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.5	15.7	39.0	44.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.6		
#10	99.5		
#16	98.0		
#30	90.8		
#40	83.8		
#50	76.3		
#100	58.0		
#200	44.8		

* (no specification provided)

Soil Description

Gray brown, Clayey SAND

Atterberg Limits

PL= 16 LL= 26 PI= 10 NM= 8.7

Coefficients

D_{90}= 0.5731 D_{85}= 0.4491 D_{60}= 0.1625
D_{50}= 0.1018 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Source of Sample: P-4 **Depth:** 1.0-4.0 feet
Sample Number: S-09062023-01 **Date:** 9/6/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

Client: Delmarva Christian School
Project: Delmarva Christian Academy

Project No: 31231819 **Figure**

Tested By: J. Maynard **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

MOISTURE-DENSITY RELATIONSHIP TEST REPORT
ASTM D 1557 Method B Modified

Project No.: 31231819 **Date:** 9/6/2023

Project: Delmarva Christian Academy

Client: Delmarva Christian School

Source of Sample: P-4 **Depth:** 1.0-4.0 feet

Sample Number: S-09062023-01

Remarks:

MATERIAL DESCRIPTION

Description: Gray brown, Clayey SAND

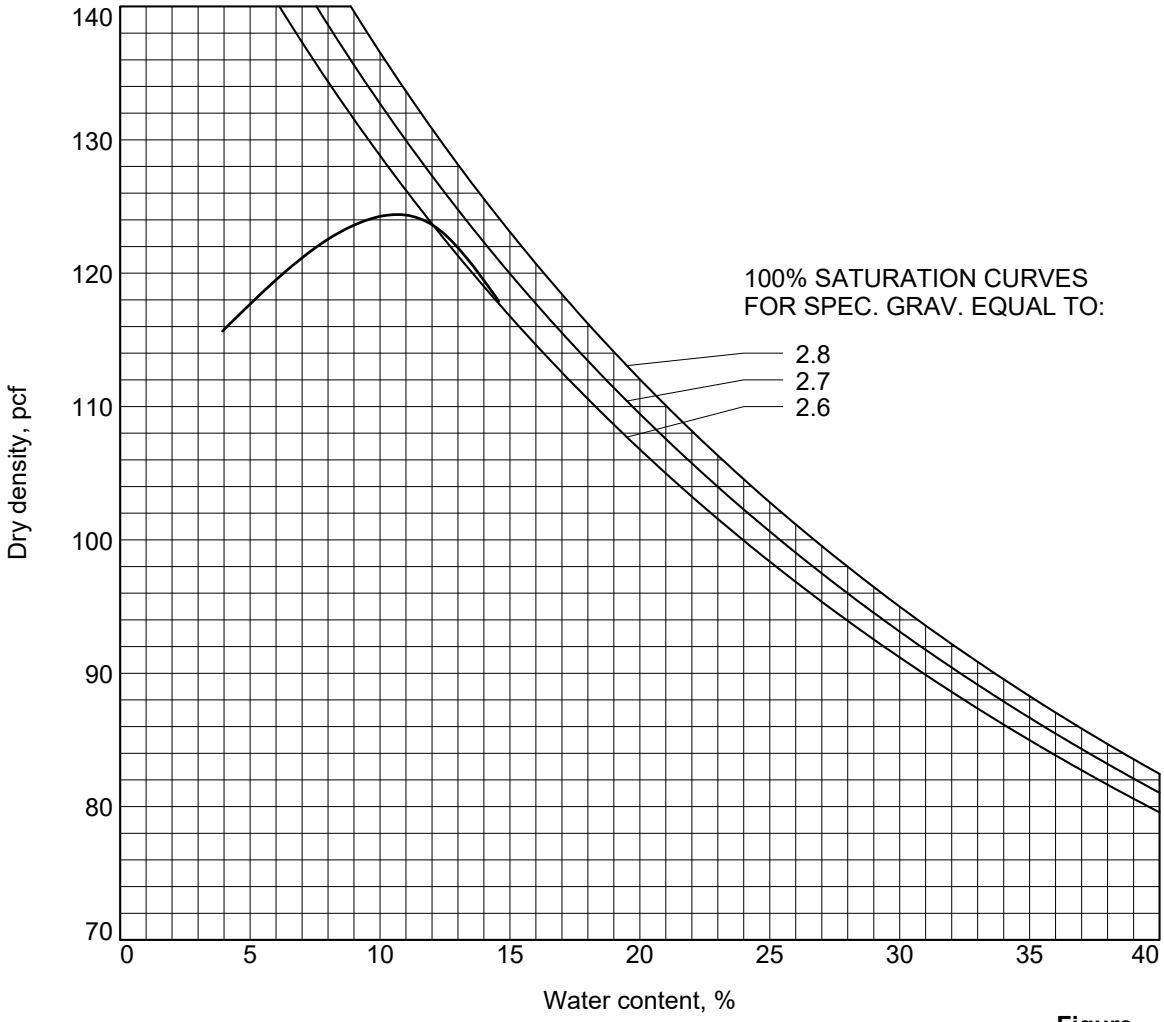
Classifications - **USCS:** SC **AASHTO:** A-4(1)

Nat. Moist. = 8.7 % **Sp.G. =** 2.6A

Liquid Limit = 26 **Plasticity Index =** 10

% < No.200 = 44.8 %

TEST RESULTS
Maximum dry density = 124.4 pcf
Optimum moisture = 10.7 %



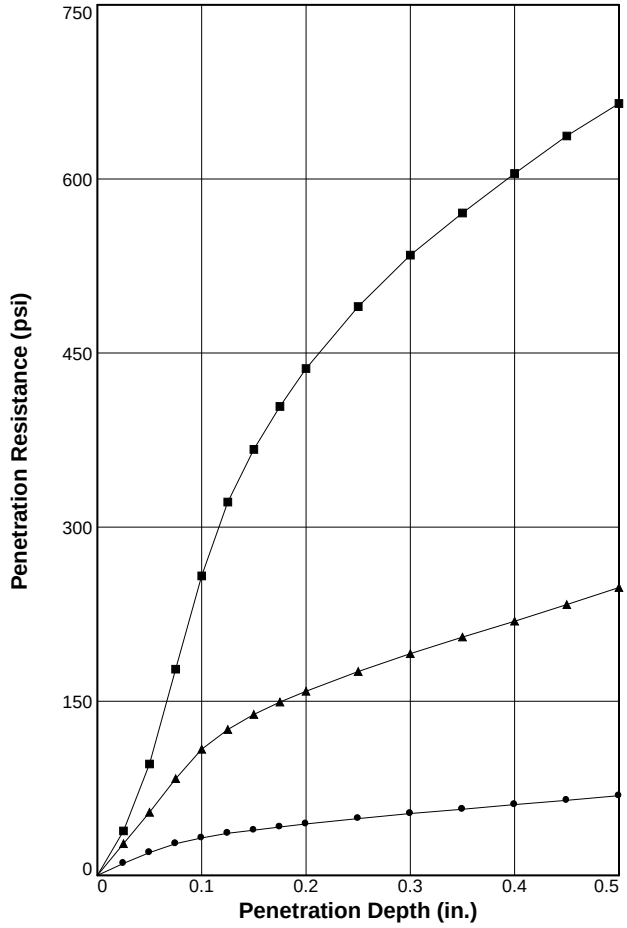
Figure

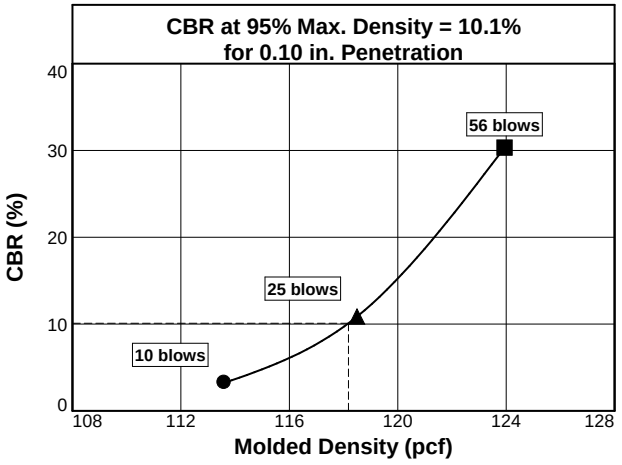
Geo-Technology Associates, Inc.

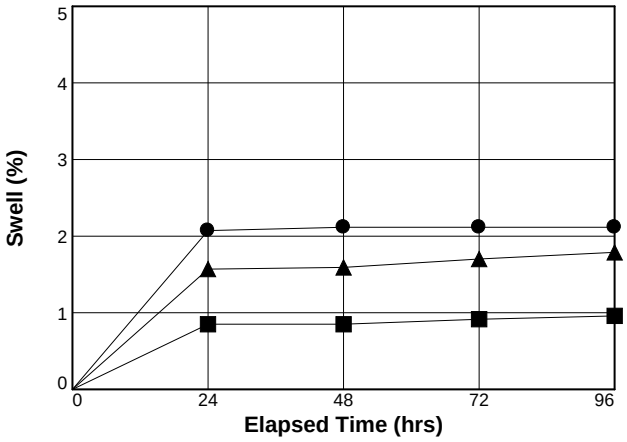
Tested By: D. Hearn **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

BEARING RATIO TEST REPORT
ASTM D1883-14







	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	113.6	91.3	10.0	111.3	89.4	18.8	3.2	3.0	0.000	10	2.1
2 △	118.5	95.3	10.3	116.4	93.6	16.3	10.9	10.6	0.000	10	1.8
3 □	123.9	99.6	9.4	122.8	98.7	14.3	30.3	30.4	0.018	10	1

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Gray brown, Clayey SAND	SC	124.4	10.7	26	10

Project No: 31231819

Project: Delmarva Christian Academy

Source of Sample: P-4 **Depth:** 1.0-4.0 feet

Sample Number: S-09062023-01

Date: 9/6/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

Test Description/Remarks:

AASHTO Classification: A-4(1)

Figure _____

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

DELMARVA CHRISTIAN SCHOOL

SECTION 011100 – SUMMARY OF WORK

PART 1 – GENERAL

1.1 Drawings and general provisions of contract, including General and Supplementary Conditions and other Division – 1 Specifications Sections, apply to this Section.

1.2 PROJECT DESCRIPTION

A. This part of the project consists of the Bid Pac A Contracts, No. 1 through No. 18. The description of the contracts are as follows:

Bid Pac A

Contract 1	Site Work
Contract 2	Concrete Work
Contract 3	Masonry Work
Contract 4	Steel Work
Contract 5	Carpentry & General Work
Contract 6	Roofing Work
Contract 7	Furnish Hollow Metal/Doors/Hardware
Contract 8	Aluminum Storefront/Windows/Glass and Glazing
Contract 9	Drywall/Metal Stud
Contract 10	Acoustical Work
Contract 11	Floor Covering Work
Contract 12	Caulking/Painting
Contract 13	Casework
Contract 14	Kitchen Equipment
Contract 15	Mechanical
Contract 15A	Plumbing
Contract 15B	HVAC
Contract 16	Sprinkler System
Contract 17	Electrical
Contract 18	Wall Panels

1.3 CONTRACTOR USE OF PREMISES

A. General: During the construction period the contractor will be allowed reasonable use of the premises. However, the contractors use of the premises will not limit the Owners use of premises.

1.4 The Construction Managers scope of work is part of this section and denotes the work to be performed.

1.5 MISCELLANEOUS PROVISIONS

A. Miscellaneous Provision

1. The construction will start in June 2025 Note that weekend and evening work may be required to meet the schedule. All materials may be procured early so that they are readily available. The Owner will pay ninety-five percent (95%) of stored materials providing they are properly insured, stored and can be verified.

B. Project Meetings

1. Pre-Construction Conference: Attendance by Owner, Architect, Engineers, Construction Manager, Contractor, major Subcontractors, and Suppliers.

2. Progress Meetings: Bi-weekly; attendance by Owner, Architect, Engineers, Construction Manager, Contractor, applicable Subcontractors, and Suppliers.

NOTE: Meetings may be held more frequently as required. Must attend these meetings and missing meetings will not be tolerated from Primary Contractors. Missing meetings will result in a penalty of $200.00 dollars per meeting if your firm was requested to attend at the previous progress meeting.

C. Record Drawings

1. The contractors of the respective Contracts 1 thru Contract 18 shall be responsible for maintaining record "as builts" throughout construction as indicated in Section 017000.

D. Schedule

Construction starts June 2025. Project has to be finished by August 2027
Please provide sufficient manpower in your cost to meet the completion date of August 1, 2027.

Contract 1	Site Work
Contract 2	Concrete Work
Contract 3	Masonry Work
Contract 4	Steel Work
Contract 5	Carpentry & General Work
Contract 6	Roofing Work
Contract 7	Furnish Hollow Metal/Doors/Hardware
Contract 8	Aluminum Storefront/Windows/Glass and Glazing
Contract 9	Drywall/Metal Stud
Contract 10	Acoustical Work
Contract 11	Floor Covering Work
Contract 12	Caulking/Painting
Contract 13	Casework
Contract 14	Kitchen Equipment
Contract 15	Mechanical
Contract 15A	Plumbing
Contract 15B	HVAC
Contract 16	Sprinkler System
Contract 17	Electrical
Contract 18	Wall Panels

Bid Pac A

The following parts of the specifications are to be considered part of each and every one of the contracts of Bid Pac A, Contracts No. 1 through 18. However, they shall not be listed with the Scope of Work for each of the Scopes of Work for the contracts. They will be referred to as the Administrative Sections with each of the Scope of Work for the contracts.

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

000115	LIST OF DRAWINGS
000116	ADVERTISEMNET FOR BIDS
002113	INSTRUCTIONS TO BIDDERS
004126	BID FORMS INCLUDING:
	BID FORM
	NON-COLLUSION STATEMENT

CONTRACTING INFORMATION

005226	AGREEMENT INCLUDING STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR (AIA A132 – 2009)
006276	MONTHLY REQUISTION & CONTINUATION SHEET (AIA G732-2009 & G703-1992)
006300	STANDARD FORMS CERTIFICATES AND MODIFICATION FORMS
007226	GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION (AIA A232-2009)
007300	SUPPLEMENTARY GENERAL CONDITIONS A232-2009 INCLUDING ATTACHMENT "A"
	CONSTRUCTION MANAGER GENERAL CONDITIONS
007316	INSURANCE INCLUDING SAMPLE CERTIFICATE OF INSURANCE
008013	GENERAL REQUIREMENTS

009300	REFERENCE MATERIALS GEOTECHNICAL REPORTS (BORING LOGS)

DIVISION 01 – GENERAL REQUIREMENTS

011100	SUMMARY OF WORK
011200	MULTIPLE CONTRACT SUMMARY
011216	ALTERATION PROJECT PROCEDURES
011400	WORK RESTRICTIONS
012000	PRICE AND PAYMENT PROCEDURES
012100	ALLOWANCES
012200	UNIT PRICES
012300	ALTERNATES
012500	SUBSTITUTION PROCEDURES
012600	CONTRACT MODIFICATION PROCEDURES
012900	PAYMENT PROCEDURES
012973	SCHEDULE OF VALUES
013100	PROJECT MANAGEMENT AND COORDINATION
013113	PROJECT COORDINATION
013216	CONSTRUCTION SCHEDULE
013233	CONSTRUCTION PROGRESS DOCUMENTATION
013300	SUBMITTAL PROCEDURES
013301	RELEASE FOR USE OF DIGITAL MEDIA
013319	FIELD ENGINEERING
013500	SAFETY
014000	QUALITY CONTROL
014100	REGULATORY REQUIREMENTS
014200	REFERENCES
015000	TEMPORARY CONSTRUCTION UTILITIES, FACILITIES & CONTROLS
016000	MATERIALS AND EQUIPMENT PRODUCT REQUIREMENTS
017000	CONTRACT CLOSEOUT
017500	FACILTY START UP/COMMISSIONING
017700	CLOSEOUT PROCEDURES
017836	WARRANTIES
017900	DEMONSTRATION AND TRAINING
019113	GENERAL COMMISSIONING REQUIREMENTS

SCOPE OF WORK - Bid Pac A
CONTRACT NO. 1 SITE WORK

A. The administrative sections, prints, addendums, and technical specifications 033000.

B. Provide all layout work required to accomplish this Contract work. A Licensed surveyor must perform the layout work.

C. Provide topsoil stripping as required. Retain and stockpile all topsoil or soil needed to re-grade the site. Any soils not needed will be disposed of offsite by this Owners contractor. This is inclusive of all new building area footprints.

D. Provide all grading and fine grading of sub-grades for swales, berms, walks, pavement and playground fields.

E. Provide all site select fill for the building, site concrete and parking areas. Include excavation and grading of any crawlspaces or basements if noted in project documents.

F. Provide all storm drainage and storm water control for a complete system including manholes, ponds and catch basins, nyoplast inlets, pumping pits, underground detention system and catch basins as shown.

G. Provide Sanitary Sewerage System complete including traffic control as need. Provide force main, grinder pump, and grease trap including of existing grease trap. Provide abandonment of existing force main.

H. Provide all crusher run for paving and site concrete.

I. Provide hot mix asphalt paving includes roto mill of existing paving. Provide upgrades of existing island and new islands.

J. Provide all striping of paving and signage required including the painting of curbs and include parking bumpers and bus parking signage.

K. Provide all lawns, grasses, hydro seeding, sodding, turf relocation and erosion control materials complete. Provide lawn maintenance (grass cutting) within the limits of disturbance for the entire construction schedule.

L. Provide all sediment and erosion control, including the installation, maintenance, and removal after construction of the silt fence and construction entrance. Restore areas where sediment and erosion control has been removed after construction. Also, provide all bio-retention areas, detention basins complete. Maintain the construction entrance and a clean roadway and street.

M. Provide all water lines, fire water lines, and site fire hydrants. Provide lines to within five (5) feet of the building with the exception of the fire water line. The fire water line is to be provided with the flange 8" above the finish floor in the fire pump room and other locations. See location on the architectural prints. Restore all areas disturbed by the installation of the new water lines. Coordinate the work with Contract No. 16 Sprinkler System. Provide flushing and testing of fire water line from street to floor flange. Flange must be capped after flushing to maintain a clean system. Provide tie bolts from underground to flange above the floor. Also, provide identification of fire hydrants per the Fire Marshal requirements. Provide temporary water for

other trades during construction. Provide water meter pit and meter complete. Provide the disinfection of the domestic water system. Provide relocation of fire hydrants. Provide water tap and traffic control.

N. Provide any temporary seeding required for erosion control.

O. Coordinate all construction work with other utilities and notify Miss Utility prior to the start of work to locate existing underground utilities. All other existing utilities on site to be located under this contract, including data communication lines if any. Any damage to the existing utilities will be repaired under this contract at no additional cost to the owner.

P. Provide all excavation and backfill required to accomplish the work of this Contract, including the proper compaction of all backfill materials. Owners contractor will Provide the removal off site of any and all excess fill. Provide compaction testing. Provide all final grading of site.

Q. Each prospective bidder must visit the site to familiarize themselves with the current existing conditions.

R. Provide all gas lines, valves, meters complete. Provide relocation and removal where required.

S. Provide the relocation or adjustment of existing utility lines as necessary to install new lines or need to be relocated due to the construction of the new building.

T. Install all bollards furnished by Contract No.4 Steel Work. Include concrete in fill as required.

U. Provide all site concrete work as shown. Run all concrete work to the face of the buildings to meet interior concrete work performed by Contract No. 2 Concrete Work. Provide all stone bases and preparation work to install the site concrete. Provide all slab work and frost walls at exterior, as well as any necessary demolition to install pads and frost walls if under a canopy roof. Provide colored, stamped and patterned concrete and exposed aggregate concrete if noted in contract documents on exterior.

V. Site contract will provide level surface for cranepad set up. Contract 4 Steel Work is responsible for any needed added material support and removal afterwards.

W. This contract is to provide the building, step and ramp fill to an elevation of plus or minus one (1") inch.

X. Construction Manager will provide all temporary fencing.

Y. Provide exterior caulking of expansion joints at all concrete locations including sidewalks and curbs.

Z. Electrical service to your construction trailer to be provided by this contract.

AA. Provide all highway entrances per DelDot specifications complete, including traffic control. Replace or relocate any existing obstructions in the roadway including mail boxes, signs, ect..

BB. Provide all underground roof and gutter drain lines, and roof drain curb outlets complete, including connections to downspouts and splash blocks. Provide the rainwater conductor and the

cast iron rainwater boots. Also provide removal of drain lines where portion of the building is being demolished and relocate where needed.

CC. Provide the demolition of all trees, shrubs and existing stumps as required. Provide offsite deposit of all demolition material.

DD. Provide CCR Reports, soil testing and all license and permits to perform the Site Work scope of work. Owner will obtain the building permit.

EE. Provide site furnishings including bike racks, gates, trash receptors, benches and all associated foundations for a complete installation.

FF. All electric lines, data lines, phone lines, etc.. are to be provided by Contract No. 17 Electrical.

GG. This contract is responsible for all demolition that pertains to your scope of work.

HH. Provide all demolition required to install new work and shown on drawings including curbs sidewalks, sheds, bollards, paving, signage, striping, storm sewer, piping, storm drainage, manholes, catch basins, benches, bollards, fencing, tree and shrub removal, etc. Provide the demolition of anything that gets removed outside of the footprint of the main existing building to build the new building including canopies, walkway covers, concrete work, foundation, ramps, loading docks and miscellaneous steel. We suggest that the site work bidders visit the job site and note the extent of the demolition required to erect the new addition, and new site work. Also protect existing trees. Contract 1 Site Work is to remove all outdoor concrete and sidewalks not attached to the building such as concrete stairs.Provide demolition of existing fencing if indicated.

II. Provide the relocation or adjustment of existing utility lines as necessary to install new lines. Including, but not limited to, phone box, utility poles, and signage.

JJ. Provide assistance of all testing and inspections for your work. Owner will provide an inspection agency to do the testing. If testing fails, contractor will pay for additional testing.

KK. Provide all fencing complete including all footings and hardware complete. Also provide all gates as shown. Provide fencing and gates for trash enclosures complete. Electric will be provided by Contract No. 17 Electrical. Provide aluminum fencing complete.

LL. Provide testing of trenches that are opened and backfilled pertaining to your scope of work.

MM. Provide dewatering if needed for your scope of work.

NN. Provide swing arm and sliding gates and all associated foundations for a complete system.

OO. Provide any boring under roadways for sewer, water, gas and storm sewer systems.

PP. Provide all fine grading of landscape beds.

QQ. Provide all soil amendments and fertilizers and the blending of these items into the top soil.

RR. Provide weed-control barriers and mulches complete.

SS. Provide all landscaping, trees and shrubs and the planting and pruning of these items complete. Provide protection of existing landscaping that is not to be removed. Provide relocation of existing landscaping as noted. Provide planting buffer.

TT. Provide plant maintenance and watering of landscaping for a period noted in the project documents.

VV. Provide planting bed irrigation complete if noted.

WW. Provide woodland removal for athletic fields and play fields.

XX. Provide shared use path complete if shown.

YY. Provide concrete wash out station for your concrete work and spill control station, including removal once complete.

ZZ. Provide street signs complete.

AAA. Furnish and install removable bollards complete and installation only of all other steel bollards. Contract No. 4 Steel Work will furnish steel bollards.

BBB. Provide temporary orange safety fencing around areas noted on bid documents.

CCC. Provide geopave porous pavement and all sub bases for a complete system where indicated.

DDD. Provide athletic field upgrades as noted and new athletic fields complete.

EEE. Provide demolition of athletic fields where indicated.

FFF. Provide as-builts of all trenched utilities as they are installed (water, elec, gas, etc..) and to as-built all field verifiable utilities (SD/sewer) Surveyed/Sealed by a licensed surveyor and provided to the owner for records..

GGG. Provide required a Type B Transportation Management Plan (TMP), which is a detailed analysis of the maintenance of traffic during construction and coordinate with DelDOT for all work to be performed on state roadways and project entrance.

HHH. Include the lump sum of the following amount $100,000 in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager.

JJJ. Provide bike racks and all associated concrete pads and footers.

KKK. Provide work as indicated in and around Tax Ditches. Coordinate with authorities having jurisdiction.

LLL. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor creating the infraction.

MMM. See section 012300 Alternates and bid form for your responsibility for the alternates.

NNN. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

OOO. It is the contracts responsibility to review all other contract scopes of work

SCOPE OF WORK - Bid Pac A
CONTRACT NO. 2 CONCRETE WORK

A. The administrative sections, prints, addendums, and technical specifications 033000, 033100.

B. Provide all layout for the building foundations, locations and elevations by a registered surveyor complete. **NOTE:** The site work layout will be provided by the site work contractor (coordinate with Bid Pac A Contract No. 1 Site Work).

C. Install all anchor bolts and the leveling, grouting and setting of the bearing plates for the structural steel material furnished by Contract No. 4 Steel Work and Contract No. 9 Drywall/Metal Stud materials. Steel and metal stud shop drawings to be used for layout of anchor bolts.

D. Provide all perimeter insulation under concrete slabs and foundation walls.

E. Provide the concrete infill for metal stairs and platforms.

F. Provide sufficient layout work in regards to the foundation so that the masonry contract can provide wall foundations. Maintain batter boards and lines until masonry contractor starts work after the masonry contract accepts layout and starts work. It is the masonry Contractors responsibility to maintain work from that point forward.

G. Provide all grading and grading of sub-grades for footings, foundation, floors and cast in place walls.

H. Provide all excavation required for foundation work and the backfill required to do the poured in place concrete work.

I. Provide all concrete foundations and rebar complete including any foundations outside the building foot print including planters, canopies, retaining walls, truck dock, piers, signage, etc..

J. Compact and backfill all trenches, foundations and other concrete work associated with this work only. Provide removal off-site of all excess soils due to excavation of your work.

K. Provide all floor slabs complete including weather (hot and cold) protection, mesh, vapor barriers, anti-slip additive, sealers, water proof barriers, composite waterproof membrane, expansion and control joints, caulking and perimeter insulation under slab for a complete system. Refer to Division 9 Flooring Sections in reference to floor finish tolerances. Concrete sealers and curing Compounds must be compatible with flooring adhesives. Any irregularities in concrete surfaces at expansion joints to be ground flat to meet flooring contractor's specifications. Provide all concrete floor slab infill areas where demolished masonry wall is removed below finish floor. Refer to Division 9 Flooring Sections in reference to floor finish tolerances.

L. Provide all concrete slab work to the exterior face of the enclosed building area. The site contract will pick it up from that point.

M. Provide stone drainage fill under all concrete slabs within the building footprint or under exterior concrete provided by this contract.

N. Provide all concrete bases and 2 x 4 sleepers required for all the locker installation. See prints for location and details. Coordinate with Contract No. 5 Carpentry and General Work.

O. **NOTE:** The item X in the site work contract scope of work. All fill in the building, step and ramps are to be plus or minus one (1") inch. This Contract is responsible to handle the preparation from that point to the completion of the concrete work.

P. Provide all depressed concrete for floor mats at entrance and all other items that need concrete depressions. Locations and sized to be coordinated with other contracts.

Q. All cast in place concrete beams, lintels and walls to be included in this contract. Bond beams and CMU grouting is responsibility of Masonry Scope.

R. It is the responsibility of this contract to coordinate with the Mechanical and Electrical Contractors, the elevation and locations of all imbedded items, at the time of pour including the proper sloping of floors to floor drains and troughs.

S. Concrete footings to be clean of all debris and dirt prior to sign off to Masonry Contractor.

T. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

U. Provide assistance of all testing and inspections for your work. Owner will provide an inspection agency to do the testing. If testing fails, contractor will pay for additional testing.

V. Notify mechanical and electrical contractors with a schedule of when the concrete is to be poured so these contractors can verify their equipment locations.

W. Provide concrete footers for trash enclosure if indicated.

X. Provide installation and concrete fill of all bollards if any shown under roof area. Steel bollards to be provided by Steel Work Contract No. 4.

Y. Provide colored concrete finish complete and pattern concrete if noted in finish schedule and specifications.

Z. Provide an allowance of $25,000 for cold weather protection. All protection to be approved by construction manager before work is performed.

AA. Existing building elevations to be confirmed under this contract.

BB. Provide infill of concrete where demolition has been performed.

CC. All concrete debris to be disposed of off-site in a required manner meeting all local, state and federal laws.

DD. Provide installation of steel edging in concrete as noted. Contract No. 4 Steel Work will furnish.

EE. Provide polished concrete with clear sealer in areas noted. Refer to Alternates.

FF. Provide all caulking and sealants for concrete slabs provided by this contract. Exposed and unexposed floors.

GG. The concrete contractor is to coordinate with surveyor on the amount of locations and elevations the surveyor is to locate. Concrete contractor is responsible for accuracy of the layout.

HH. Provide testing of trenches that are opened and backfilled pertaining to your scope of work.

II. Provide dewatering if needed for your scope of work.

JJ. Provide reinforcement for all concrete provided by this contract.

KK. Provide self adhering sheet waterproofing and composite waterproofing complete.

LL. Provide sealed concrete complete.

MM. Provide termite control system.

NN. Provide concrete seat.

OO. Provide concrete wash out station.

PP. Provide cast in place stairs and landing and check wall at all interior and exterior locations.

QQ. Provide insulation that is under concrete pads.

RR. Provide concrete infill at existing walls and floors where demolition items have been removed.

SS. Provide interior and exterior ramps and pads noted on structural drawings complete.

TT. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

UU. See section 012300 Alternates and bid form for your responsibility for the alternates.

VV. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

WW. It is the contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK – Bid Pac A
CONTRACT NO. 3 – MASONRY WORK

A. The administrative sections, prints, addendums, and technical specification sections 033000, 042000, 071100,072100,076200,079200.

B. Provide all masonry work complete including cmu block, pre-cast concrete units, split face block and brickwork, and including decorative block, jack arches, dumpster walls, signage walls, etc. All hollow metal doors and frames are to be stored and set by Contract No.5 Carpentry and General Work.

C. Provide all concealed and thru wall flashings.

D. Provide cavity wall insulation and other insulation attached between masonry walls and masonry veneer. Perimeter foundation wall insulation to be provided by Contract No. 2 Concrete Work. Provide cavity drainage mat system. Provide all rigid insulation that is located between masonry and masonry veneer. Contract No. 9 Drywall/Metal Stud will provide ridged insulation where attached to metal stud framing or masonry wall and no masonry veneer is located. Contract 9 Drywall/Metal Stud will provide all spray applied membrane air barriers.Contract 3 Masonry provides transition membrane around window and doors, etc.. where there is masonry backup and veneer.

E. Provide the installation of all bearing plates and bolts associated with the masonry for the steelwork and cold formed metal framing. The plates and bolts will be furnished by Contract No. 4 Steel Work. Steel contractor and masonry contractor to coordinate locations and placement of items at the time of masonry construction.

F. Install all steel lintels attached or resting on masonry work finished by contract No. 4 Steel Work. Provide masonry pockets and grout filling of masonry cores where steel beams are attached or resting on masonry work. All structural steel beams provided and installed by Contract No. 4 Steel Work.

G. Provide the concrete and rebar for all the filling of block cores, bond beams and bearing points. Include all reinforcements, wall anchors and fasteners to attach to sub surface.

H. Install joist bearing plates furnished by Contract No. 4 Steel Work that rest on masonry. Coordinate with Contract No. 4 Steel Work.

I. See Item F Contract No. 2 Concrete Work for the layout and maintenance responsibility. This contract is responsible for layout of their portion of their work.

J. Provide all grouting of masonry walls required. Also provide grouting of new doors and frames in existing openings.

K. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

L. Provide fire stopping and protection for masonry walls including fire safing with mineral wool insulation. Provide wall markings for masonry fire and smoke partitions. Provide fire or acoustical sealant where wall intersects with floor or roof deck.

M. All masonry debris to be disposed of off-site in a required manner meeting all local, state and federal laws.

N. Provide masonry opening required for mechanical and electrical equipment. Location and sizes must be coordinated with each contractor. Also include masonry openings for other trades and access panels and doors as noted by these trades.

O. Provide an allowance of $25,000 for cold weather protection. All protection to be approved by construction manager before work is performed.

P. All wall penetrations to be patched prier to painting or cost of touch up painting to be deducted from contract.

Q. Provide bituminous damp proofing and all related accessories as noted on the project documents that is attached to masonry. Also provide waterproof membrane at locations noted in project documents.

R. Furnish all wall anchors that are welded to steel beams and coordinate with Contract No. 4 Steel Work for the welding of these anchors only. All other wall anchors are to be furnished by the mason.

S. Provide cement plaster if noted in project documents.

T. Provide the repairs of masonry due to the removal of existing attachments to the existing building due to demolition required to clear the area for the new building. Provide patching where the new and remaining existing building intersect.

U. Masonry contractor to coordinate the cleaning of debris from the foundation with the concrete contractor in a timely manner. Concrete contractor to clean foundation one time.

V. Provide caulking for control joints in masonry, expansion joints in masonry, cast stone joints and any place that are similar products with masonry. Any masonry to a dissimilar product is to be by other contract."

W. Provide modifications and relocation for masonry openings for windows, doors and louvers. Include patching and infill of masonry where new and existing windows and doors are to be located.

X. Provide masonry infill as shown in details throughout the prints. **NOTE**: Read all prints carefully. Also provide all the flashing required as shown on the details to secure a waterproof building.

Y. Provide all concrete floor slab infill areas where demolished masonry wall is removed below finish floor. Refer to Division 9 Flooring Sections in reference to floor finish tolerances.

Z. Provide date stones and time capsule complete if indicated.

AA. All anchor bolts for structural steel set in CMU is to be furnished by Contract A-4 Steel Work and installed by Contract A-3 Masonry. Any fasteners required other than anchor bolts provided by each contractor for their scope of work.

BB. Provide assistance of all testing and inspections for your work. Owner will provide an inspection agency to do the testing. If testing fails, contractor will pay for additional testing.

CC. Provide spray polyurethane foam between masonry wall and roof and floor connections.

DD. Provide masonry for site sign if indicated.

EE. Provide removal off site of all demolition debris in a required manner meeting all local, state and federal laws.

FF. Provide all select demolition required of all interior and exterior masonry areas in the project. The debris must be disposed of off-site in a required manner meeting all local, state, and federal laws. Provide shoring, bracing or other support where required due to demolition.

GG. All anchor bolts set in CMU is to be furnished by Contract A-4 Steel Work and installed by Contract A-3 Masonry. Any fasteners required other than anchor bolts provided by each contractor for their scope of work.

HH. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

II. See section 012300 Alternates and bid form for your responsibility for the alternates.

JJ. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of for the project.

KK. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK – Bid Pac A
CONTRACT NO. 4 STEEL WORK

A. The administrative sections, prints, addendums, and technical specification sections 024119, 051200, 052100, 053100, 055133.

B. Provide and install all structural steel, steel joist, bridging, decking, and other miscellaneous steel for a complete job. Touch up with metal primer all areas required caused by welding. Provide structural steel framing and supports for mechanical and electrical equipment.

C. Furnish all steel lintels, bearing plates or bolts shown to install in the masonry by Contract No. 5 Masonry. Steel contractor is responsible for verifying dimensions and elevations of these items prior to setting steel. Provide required steel coatings on lintels.

D. Furnish all anchor bolts and bearing plates to be installed in concrete by Contract No. 4 Concrete Work. Steel contractor is responsible for verifying dimensions and elevations of these items prior to setting steel.

E. Provide all railings at ramps or steps complete. Rails are to be core bored into concrete pads or masonry. Provide aluminum or steel rails, posts and hardware as shown.

F. Furnish all bollards required on the site to Contract No. 1 Site Work and Contract No. 2 Concrete Work for their installation.

G. Provide all miscellaneous steel items along with support system for each item including wall termination plates and angles where walls terminate next to steel decking. Provide miscellaneous steel framing for overhead coiling doors, operable partitions and other suspension systems. Provide all gauge bent plate and continuous gauge plate.

H. Provide all steel framing for the canopies complete.

I. Provide all railings complete including sleeves if required.

J. Provide all stairs, ladders, safety cages, rails, railings, guardrails, steel corner guards, steel stair nosing and any other aluminum or steel products shown. Provide steel gates including at stairway location if indicated.

K. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

L. Provide all steel products that are anchored in to the walls. Provide steel post supports in stud walls complete. Also provide top of wall steel angle bracing, grating, edge guards, SST mesh and metal nosing. Provide metal fabrication complete. Provide bent plates and angles complete. Provide parapet steel plate and roof edge steel angles.

M. Provide all steel decking, including any decking that maybe fastened to cold form metal trusses and framing if shown. See specification for different types of decking. Include deck cell insulation on acoustical deck.

N. Provide welding of wall anchors furnished and located by Contract No. 3 Masonry Work that are attached to steel.

O. Provide assistance of all testing and inspections for your work. Owner will provide an inspection agency to do the testing. If testing fails, contractor will pay for additional testing.

P. Furnish steel plate and fasteners that sets on top of parapet walls. Carpentry contract will install.

Q. Provide 3" pipe stud at cold formed framed half wall locations and coordinate with meta stud/drywall contract.

R. Provide steel for roof mechanical screens. Louvered panels provided by Contract No. 5 Carpentry & General Works. Refer to Alternates.

S. Provide architecturally exposed structural steel.

T. Provide all complete selective demolition of joist, decking, railings, stairs, miscellaneous steel, ladders and structural steel. Provide the temporary shoring that may be necessary to remove existing steel that is replaced or modified for the new addition or the renovation of the existing.

U. Temporary Shoring has been avoided to the greatest extent possible with the current details. Any temporary shoring that is required is a delegated design item and the design and implementation of the shoring is the esponsibility of the contractor.

V. The AISC Certified Erection requirement is waived for this project. The Special Inspections set forth in the IBC should be followed closely**.**

W. Contract 4 Steel is to confirm elevations of foundations prior to setting steel.

X. Contract 1 Sitework will provide level surface, if additional material is needed for crane pad, Contract 4 Steel Work is responsible for any needed added material support and removal afterwords.

Y. Provide an allowance of $25,000 for miscellaneous metals. This allowance is to be used by the discretion of the construction manager.

Z. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

AA. See section 012300 Alternates and bid form for your responsibility for the alternates.

BB. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

CC. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK – Bid Pac A
CONTRACT NO. 5 CARPENTRY & GENERAL WORK (FOR REFERENCE ONLY)

A. The administrative sections, prints, addendums, and technical specification sections 024119, 033000,061000,081113,081416,083302,087100,102114,104413,116653,122413,133416,16623

B. Provide the installation and proper storage of all hollow metal frames furnished by Contract No. 7 Furnish Hollow Metal/Doors Hardware. These items will be tailgate delivery.

C. Provide the installation and the proper storage of all wood, fiberglass and hollow metal doors furnished by Contract No. 7 Furnish Hollow Metal/Doors Hardware. These items will be tailgate delivery.

D. Provide the installation and the proper storage of all hardware furnished by Contract No. 7 Furnish Hollow Metal/Doors Hardware. These items will be tailgate delivery.

E. Provide all toilet partitions and wood blocking required in walls to install the toilet partitions.

F. Provide all exterior building signage, plaques and cast letters complete.

G. Provide all lockers and benches including wood blocking required to install the lockers. The concrete bases are provided by Contract No. 2 Concrete Work. Coordinate work with this Contract. Refer to Alternates.

H. Provide fire extinguishers, AEDS, cabinets, and accessories including any wood blocking required to install the cabinets and extinguishers. Also, remove store and reinstall existing cabinets in new location if noted.

I. Provide all toilet accessories and mirrors including all concealed wood blocking to install the toilet accessories and mirrors or cutting of masonry to install toilet accessories. Contract No. 15 Mechanical will provide lavatory shields and shower seats at required locations. Hand dryers provided by this contract and wired by Contract 17 Electrical.

J. Provide all miscellaneous specialties complete plus all suspension systems complete to install the miscellaneous items. The extent of miscellaneous specialties is indicated on the drawings, but are not limited to the following: display cases, etc..

K. Provide wood blocking required to install p-lam stools by Contract 13 Casework. Provide wall caps for intermediate height walls. Contract No. 5 Carpentry & General Works provides wood wall caps on half walls. P-lam or solid surface wall caps and sills provided by Contract No. 13 Casework.

L. Provide all wood trims and panels complete including blocking required. Provide wood wall caps as noted. Provide wood treads and risers for stairs if noted.

M. Provide all expansion, fire rated and architectural control joint covers assemblies as shown. Coordinate with other contracts involved. Roof joint covers provided by roofing contract.

N. Provide all plywood sheathing and wood framing required. Include all hurricane ties as shown. Provide fire rated plywood and lumber if noted in project documents. Provide wood blocking and furring for roof curbs.

O. Provide all visual display boards, glass boards, display cases, tack boards, tack strips, tackable surfaces, cubicle curtains and tracks, recovery couch and wood blocking required.

P. Provide all wood blocking required on the project whether shown on the contract documents or not, including casework blocking and kitchen equipment blocking.

Q. Provide all architectural louvers that are required other than the louvers required by the mechanical equipment provided by Contract No.15 Mechanical. Louvers that is required for mechanical systems to be provided by Contract No. 15 Mechanical Complete. Contract No. 5 Carpentry and General Work to provide all other louvers complete that are not required for mechanical equipment.

R. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

S. Provide all wood and metal storage shelving in closets and other areas. P-lam and melamine shelving provided by Contract No. 13 Casework.

T. Provide all wood blocking required at roofing locations so that the roofer can install his work. **NOTE**: all locations included but not limited to skylights, roof hatches, and other items. This includes rooftop mechanical items and wood roof curbs as required.

U. Provide overhead doors, security grills and coiling doors complete, including openers and all related items. Provide stainless steel counters associated with doors noted above including stainless jambs and aluminum wrapped moldings. Provide fire rated doors.

V. Provide window roller shades and blinds ncluding electric roller shades at all windows noted.

W. Provide roof, wall and floor access doors or panels and materials to install compete. Mechanical, Sprinkler, and Electrical contractors to provide access panels or doors for their portion of work. All other panels or doors by this contract if shown on plans.

X. Provide all blocking complete for projection screens. Projection screens will be provided by owners vendor."

Y. Provide mechanical screen panels complete. Steel supports provided by Contract 4 Steel Work. Refer to Alternates.

Z. Provide the patching as required where doors and jambs are removed.

AA. Provide knox box complete.

BB. Provide athletic equipment including score boards, wall pads, backboard edge padding, basketball and volleyball equipment and blocking complete.

CC. Provide display case and all glass, tracks, shelving, tack able surfaces and wood complete.

DD. Provide decorative formed & metal closures, trims and all related items for complete systems. Also provide decorative formed metal closures and trims complete, fiberglass, and metal column covers complete.

EE. Provide gym divider curtain and all associated fasteners, tracks and support system for a complete system.

FF. Provide all wood trims, azek, moldings, impro wall coverings, FRP panels and blocking required complete. Also provide wood benches.

GG. Provide all wood framing for floor, walls, stairs, ceilings, and roof. Provide fire rated wood framing and plywood as noted.

HH. Provide asphalt felt barrier between all treated wood blocking that comes in contact with steel or cold formed framing.

II. Provide plank lap siding ands all trims, accessories, flashings and fastners for a complete system including the caulking of joints as required.

JJ. Provide all signage and cast letters, ADA signage, directories, logo signage and plaques for a complete system including wood blocking. Provide pin mounted lettering and aluminum panel sign.

KK. Provide spray fire resistant material on structured steel if noted.

LL. Provide solatube skylights complete. Contract 6 Roofing to provide waterproofing and flashing of skylights.

MM. Provide rustless netting system with trolley complete; including all hardware and fasterners for a complete system.

NN. Provide wood cross and fastening system.

OO. Provide concrete seat bench top.

PP. Provide residential appliances complete. Electrical and plumbing hook ups and venting by Contracts 15 and 17. Contract No. 14 Kitchen Equipment will provide kitchen equipment.

QQ. Provide impact wall protection and corner guards complete.

RR. Install steel plate furnished by steel contract on top of parapet walls to fasten wood blocking.

SS. Provide all work noted as by General Contractor as noted on Food Service drawings that is not part of mechanical or electrical scope of work.

TT. Provide the installation and proper storage of fire rated steel framed entrances complete, furnished by Contract 7.

UU. Provide allowance of $25,000 for temporary enclosures as described in Section 015000 Temporary Construction Utilities, Facilities & Control Item 3.14Enclosures.

VV. Provide fire rated roll down opening system and counter roll down protection complete.

WW. Provide assistance of all wood framing testing, inspections and special inspections as noted in your related specifications or noted on drawings that relates to your scope of work. Owneris to provide all testing and inspections whether noted otherwise in other locations in the documents.

XX. Provide cubicle curtains, recovery couch and tracks and all associated hardware and fasteners. Provide blocking for tracks.

YY. Provide interior and exterior electronic scoreboards, shot clock and all hardware and foundations for a complete system where indicated.

ZZ. Provide telescoping gym bleachers and all hardware for a complete system.

AAA. Include the lump sum of the following amount $100,000 in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager.

BBB. Provide wall protection complete.

CCC. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

DDD. See section 012300 Alternates and bid form for your responsibility for the alternates.

EEE. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of for the project.

FFF. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK Bid Pac A
CONTRACT NO. 6 ROOFING

A. The administrative sections, prints, addendums, and technical specification sections 024119, 072100,072200,074113,074213,075423,076200,077200,079200.

B. Provide all roof membrane and all other roofing complete including all rigid insulation, nailable deck sheathing, tapered insulation, dens deck board, asphalt shingles and standing seam metal roofing..

C. Provide all flashing required to make a complete roof system including fiberglass and hypalon flashing. Also, include any flashing necessary for the waterproofing of new mechanical and electrical equipment. Provide EPDM flashing with termination bar and sealants as noted in the project documents. Also provide all roof expansion joint covers.

D. Provide all aluminum trim, parapet wall caps, roof accessories, traffic pads, copings, riglets, counter flashings, metal coping system, walkways, ridge vent, gutters and downspouts, splash blocks, ice & water guards, roof hatches with safety rails, roof curbs and roof accessories as shown.

E. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

F. Provide all caulking sealants that are related to roofing that is provided under this contract. Provide reglets and counter flashings for all roof locations and Masonry Contract No. 3 will provide thru-wall flashings. Coordinate with Contract No. 3 Masonry for flashing compatibility.

G. Provide all flashing for prefabricated roof curbs and rails to make water proof.

H. Provide bituminous damp proofing and self adhering sheet waterproofing on roofing areas complete. Masonry Contract 3 will provide bituminous damp proofing applied to masonry and Contract No. 2 Concrete will provide waterproof barriers and composite waterproof membrane under concrete.

I. Provide the roof construction infill at all existing roof penetrations where mechanical or electrical items have been removed so that the new roofing can be installed if indicated.

J. This contract is responsible for all demolition that pertains to your scope of work. Provide demolition of copings, cornice, metal roof edge, metal flashings, sidings, roof hatch, roofing materials, etc as indicated.

K. Provide the removal of all existing roofing that must be removed for the installation of the new roofing system complete. Provide temporary protection of exposed surfaces after demolition of existing roofing as indicated.

L. Coordinate final connections of downspouts to underground piping with site contractor.

M. Carpentry contract to provide floor, wall and ceiling expansion joint covers. Roofing contract to provide roof expansion joint cover.

N. Provide the metal roof edge metals including all accessories for a complete system.

O. Provide water proofing and flashing of new skylights provided Contract 5 Carpentry.

P. Contract No. 6 Roofing will provide demolition of existing roofing product and wall panels at the time of installation of new roofing material. Provide temporary protection of exposed surfaces after demolition of existing roofing.

Q. Provide removal of existing gutters and downspouts if shown.

R. Provide roof edge fall protection complete.

S. Provide the field measurements of roof, trims, copings. Field measure when each sections are ready for measurement. Do not wait for the entire building to be ready to field measure but when each section is ready. Any cost for manufacturer supplier or contractor to provide this service is to be included in base bid cost.

T. Provide smoke vents complete unless connected to HVAC equipment. If vents are connected to mechanical equipment contract 15 Mechanical will provide.

U. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

V. See section 012300 Alternates and bid form for your responsibility for the alternates.

W. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope for the project.

X. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK Bid Pac A
CONTRACT NO. 7 FURNISH HOLLOW METAL/DOORS HARDWARE

A. The administrative sections, prints, addendums, and technical specification sections 081113, 081416,084113,088000.

B. Furnish all hollow metal frames, hollow metal barrow lites, all steel windows, hollow metal doors, all wood doors, and all hardware complete. Furnish wood infill panels window and door and louvers mullions that are fastened in hollow metal frames. Contract No.5 is responsible to place material in their storage area. Contract No. 7 to tailgate deliver to storage area. All materials need to be properly marked and identified for installation by Contract No. 5 Carpentry and General Work. Develop a sign-off system so that both parties of Contract No. 5 Carpentry and General Work and Contract No. 7 Furnish Hollow Metal/Doors Hardware agree the correct amount of material has been delivered.

C. Provide all required hardware templates and reference material so that Contract No. 5 Carpentry may install the material. Contract No. 7 Furnish Hollow Metal/Doors Hardware will be responsible for providing and coordinating information with all other trades that interfaces such as Contract No. 5 Carpentry and General Work and Contract No. 8 Aluminum Storefront/Windows/Glass and Glazing and Contract No. 17 Electrical.

D. Furnish the hardware to Contract No. 8 Aluminum Storefront/Windows/Glass and Glazing Contractor to install.

E. Electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

F. Access control system is to be provided by owner, doors/frames are to be prepped for them under your contract. Provide all hardware accept card readers as noted in the hardware specifications.

G. Furnish fiberglass doors complete if noted.

H. Furnish wood frames, stile and rail wood doors, fiberglass doors and fire rated steel framed entrances and storefronts complete.

I. Provide automatic door operators complete. Contract 5 Carpentry will install on all non-aluminum storefront doors and Contract 8 Aluminum Storefront contract is to install on any storefront doors. Contract 17 Electrical is to provide power and low voltage to operator.

J. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

K. See section 012300 Alternates and bid form for your responsibility for the alternates.

L. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

M. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK Bid Pac A
CONTRACT NO. 8 ALUMINUM STOREFRONT/WINDOWS/GLASS AND GLAZING

A. The administrative sections, prints, addendums, and technical specification sections 076200, 079200, 084113, 084413, 088000

B. Provide all aluminum entrances, storefront, spandrel glass, aluminum windows, aluminum window sills, translucent wall assemblies, curtain walls, and doors complete. Provide all break metal around new windows and doors complete. Provide all window and door mullions that are attached to aluminum windows and doors. Also provide window panning, low pressure foam insulation around window units, and simulated divided lite with applied grids if shown.

C. Install all hardware for the aluminum doors. Coordinate with Contract No.7 Furnish Hollow Metal/Doors/Hardware.

D. Provide all glass and glazing. Include in doors and windows furnished by Contract No. 7 Furnish Hollow Metal/Doors/Hardware. Also include applied grids for simulated divided lite if shown. Provide structural silicone joints complete. Provide fire and insulated glazing and firerated aluminum door and window panels.

E. Provide all caulking for new work provided by this contract including interior and exterior windows and storefront."

F. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

G. Electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source.

H. Provide cleaning of glass and frames at completion of installation.

I. Provide decorative surface applied film and ballistic film on glass as noted.

J. Provide all prefabricated canopies and all fasteners and hardware for a complete system.

K. Temporary closures may not be necessary during the period of construction. Once the interior finishes are to begin installation; temporary closures will be needed. If windows and doors are not available for installation when openings are ready; Contract No. 10 Aluminum Storefront is to provide temporary closures for the openings until finished windows and doors are installed.

L. Provide aluminum head and sill flashings and all other associated flashings for your product for a complete system. Provide self adhering flashing around windows and doors.

M. Provide fire rated joint system for aluminum entrances, curtain wall and storefront complete.

N. Provide all Demountable Partitions including all associated hardware for a complete system as shown on project documents.

O. Provide safety and security films complete where indicated.

P. Insstall automatic door operators attached to storefront doors. Contract 7 Carpentry is to install all others.

Q. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

R. See section 012300 Alternates and bid form for your responsibility for the alternates.

S. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

T. **It is this contracts responsibility to review all other contract scopes of work.**

SCOPE OF WORK Bid Pac A
CONTRACT NO. 9 DRYWALL/METAL STUD

A. The administrative sections, prints, addendums, and technical specification sections 054000, 061000,072100,092900.

B. Provide all batt insulation (walls and ceilings). Provide all rigid and spray foam insulation that attaches to all metal framing and masonry walls. Provide mineral wool board insulation. Provide structural nailable insulated sheathing and parapet sheathing. Provide transition membrane around window and doors, etc...

C. Provide all metal stud, framing, furring and drywall work complete. Provide slide clips on structural beams for metal stud wall support. Provide metal furring whether shown or not on drawings at all locations including masonry walls for attachment of substrates. Also provide all cold formed metal trusses and all brackets and clips complete. Provide all tile backer board complete. Provide sealants to top and bottom of partitions and at penetrations to seal. Provide infill framing at existing walls and openings. Provide girts and hat channels complete. Provide gypsum wall board on metal furring at wall and ceiling locations.

D. Provide all metal blocking required.

E. Coordinate with Contract No. 5 Carpentry so that they can install any wood blocking required in the metal stud walls.

F. Provide all bulkhead, soffit framing, parapet wall framing and framing for cants at roof complete. Provide z-furring and metal strapping for soffts and siding.

G. Provide all gypsum sheathing work complete, including all vapor barrier, weather bariers and air infiltration barriors and building wrap or building paper. This contractor is responsible for maintaining the proper attachment of the barriers and building paper to the building until the final veneer covers the area.

H. Provide all drywall suspended ceilings, walls, shaft walls, fascias and soffits called for on the prints complete including all framing required. Coordinate with Contract No. 16 Mechanical, No. 16 Sprinkler System and No. 17 Electrical. Provide framing for access panels supplied by this contract. Wrap steel columns with drywall.

I. Provide all expansion control required for drywall and all gypsum board moldings and Z reveal trim. Provide sealant and caulk for the Z reveal trim.

J. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

K. Provide fire protection for metal stud walls or ceilings as shown including fire safing mineral wool insulation and fire or acoustical sealant. Provide fire safing and smoke sealant between floors and curtain wall assemblies. Provide acoustical and fire rated insulation in deck flutes where walls intersect.

L. Provide all hurricane ties and clips complete that are fastened to cold form framing.

M. As part of the warranty portion. Provide an inspection of drywall and plaster with the owner after 1 year of substantial completion and identify locations to be re pointed due to flaws and cracks in the drywall and plaster. Repair all areas and repaint as needed. Any defect caused by abuse will be charged to the owner.

N. Provide wall labeling for smoke and fire walls for drywall/metal stud walls or ceilings.

O. Provide assistance of all cold formed metal framing testing, inspections and special inspections as noted in your related specifications or noted on drawings that relates to your scope of work. Owner is to provide all testing whether noted otherwise in other locations in the documents.

P. Provide insulated air barrier system to the complete exterior of the building including masonry and metal framed wall systems. Also include spray foam insulation with intumessant coating complete if required.

Q. Provide modifications and relocation of metal framing for windows and door opening. Include patching and infill of metal framing and drywall where new and existing windows are to be located.

R. Provide <u>all</u> sealant or elastomeric spray as noted where walls meet metal deck as shown on contract documents. Provide for metal stud and masonry walls complete.

S. Provide all spray applied cellulosic and polyurethane foam insulation complete.

T. Provide wall tile cement backer board in areas where tile wainscot is shown.

U. Provide spray fire resistant materials and all associated accessories as noted in the project documents. Coordinate with other trades that have attachments to this location.

V. Provide fiberglass wall panels, abuse resistant gypsum board and gypsum liner panles complete.

W. Provide the insulation of all cold formed headers complete.

X. Provide all bullet resistant panels as shown on project documents.

Y. Provide sprayed acoustical insulation and prep of surface to receive coating.

Z. Provide metal stud infill at renovated areas of construction.

AA. Provide all intumescent coatings complete where indicated.

CC. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

DD. See section 012300 Alternates and bid form for your responsibility for the alternates.

EE. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of for the project.

FF. **It is this contracts responsibility to review all other contract scopes of work.**

SCOPE OF WORK Bid Pac A
CONTRACT NO. 10 ACOUSTICAL WORK

A. The administrative sections, prints, addendums, and technical specification sections 095110, 09890.

B. Provide all the new acoustical and lay-in ceilings required including the hangers for a complete system. Also include all acoustical wall and ceiling panels, suspended decorative grid, clouds, wood panel ceilings and specialty ceilings. Provide aluminum fascias and trims as noted. Provide axiom trim.

C. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

D. Provide all insulation if shown above the acoustical ceilings.

E. Provide metal lay in ceilings and panels complete if noted in project documents.

F. Provide specialties ceilings, wood, metal blade, metal linear, plank, baffle and linear ceiling, metal panel ceilings, blade system complete where indicated.

G. Provide tackable fabric wrapped panels complete.

H. Provide sound absorbent wall units complete.

I. Provide acoustical room components and wall panels complete.

J. Provide cloud diffusers, laminate baffles, barrels, clouds, metal works and specialty ceilings complete where indicated.

K. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

L. See section 012300 Alternates and bid form for your responsibility for the alternates.

M. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

N. It is this contracts responsibility to review all other contract scopes of work

DELMARVA CHRISTIAN SCHOOL

SCOPE OF WORK Bid Pac A
CONTRACT NO. 11 FLOOR COVERINGS

A. The administrative sections, prints, addendums, and technical specification sections 093000, 096516,096519,096813,096816,098700.

B. Provide all preparation of walls and floors to receive the new base and floor tile.

C. Provide all base complete except the wood bases. Provide rubber profile base and millwork resilient base complete.

D. Provide all resilient tile flooring complete including the concrete floor preparation and patching to receive the new material. This includes all VCT, rubber and luxury vinyls.

E. Refer to the Finish Schedule for the scope of work.

F. Provide all carpet and carpet tile complete and all floor preparation and patching to receive the new material.

G. Provide all rubber floor, rubber treads and risers for all stairs and landings as shown.

H. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

I. Provide vinyl tile, walk off mats, and ceramic, porcelain and quarry tile and all associated accessories for a complete system. Include floor preparation and patching to receive the new material. Provide tile on stairs complete.

J. Provide synthetic athletic flooring including court stripping and floor logo signage.

K. Provide all preparation of walls and floors to receive the new base, floor tile, and carpet after the existing materials have been removed. The debris can be placed in the jobsite dumpster. **NOTE:** Site visit is essential to determine your floor preparation.

L. Provide final cleaning, waxing and sealing of all floor coverings furnished by this contract per manufacturers' recommendations and project specifications. Provide protection of finished floor coverings until completion of the project.

M. Provide resinous flooring and base complete including preparation of sub base.

N. Provide custom logo walk off mat.

O. Provide all transitions for all the flooring types needed for the project complete.

P. Provide schluter systems metal edge guards at all outside wall corners of ceramic tile walls as noted in documents.

Q. Provide abrasion nosing on first and last tread of all stairs as noted on the documents.

R. Provide all preparation of walls and floors to receive the new wall and floor tile.

S. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

T. See section 012300 Alternates and bid form for your responsibility for the alternates.

U. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

V. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK Bid Pac A
CONTRACT NO. 12 CAULKING/PAINTING

A. The administrative sections, prints, addendums, and technical specification sections 079200, 099123.

B. Provide all exterior and interior caulking required except the caulking required by Contract No. 8 Aluminum Storefront/Windows/Glass and Glazing, Contract No. 1 Sitework, Contract No. 2 Concrete Work, Contract 3 Masonry work and Contract 18 Wall Panels. Prepare the surfaces to receive the new caulking. Also, include any location where dissimilar materials meet not covered in above contracts. Provide caulking for all other areas of construction except those contracts listed above.

B. Provide all exterior and interior painting including the preparation of new and existing surfaces to receive the new paint. Provide painted graphics as noted in project documents. **NOTE:** Special attention needs to be given for existing surface preparation. Paint all new and existing walls, ceilings, trims, frames, etc..

C. Provide the sanding, cleaning and painting of all exterior lintels, steel rails and other metals including bollards and exposed ceilings.

D. Reference the finish schedules for the scope of work as well as the prints.

E. Provide all epoxy, high performance coatings, painting, concrete sealer paint and exposed ceiling painting including the preparation of the areas to receive painting. See the finish schedule.

F. Painters option to apply finish coat of paint after all finishes are installed or be responsible for ALL touch up necessary.

G. Electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

I. Provide all caulking that is required where casework meets walls, floors or ceilings if required. Also provide caulking of drywall trim/block interface as noted on the reveal details on the project documents. Provide caulking at all trims, moldings.

J. Provide interior caulking to **all** windows and door frames. Drywall returns, sills and etc. would be the responsibility of this contract to caulk. Caulk between the top of wood base and wall.

K. Provide the painting of exposed conduit, sprinkler, plumbing and mechanical piping and duct work. Painting Contractor shall coordinate work with Sprinkler, Mechanical and Electrical Contractors.

L. Provide two color graphic in gym and cafeteria as noted in the documents.

M. Provide staining and varnishing of job site finished wood products include prep of material complete except wood flooring.

N. Provide wall coverings including preparation of walls for a complete system if indicated.

O. Provide exterior painting of all unfinished products.

P. Provide interior painting of all unfished surfaces.

Q. Included in all prep of surfaces is the light sanding of surface and filling of nail and screw holes.

R. Provide painting of exposed fire sprinkler piping and connections.

S. Paint mechanical screen steel complete. Reference Alternates.

T. Provide the painting or staining of exterior siding and trim complete including caulking of joints.

U. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

V. See section 012300 Alternates and bid form for your responsibility for the alternates.

W. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

X. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK Bid Pac A
CONTRACT NO. 13 CASEWORK

A. The administrative sections, prints, addendums, and technical specification section 064116,123531.

B. Provide all casework in the office area, work room, classrooms, library, bathrooms, reception desk, circulation desk, library shelving, cubbies and other areas noted on drawings. Provide all wood work and trim that is attached to casework and cubbies.

C. This Contract is responsible to have personnel on the jobsite to receive material being shipped to the jobsite, and climate controlled storage units for temporary storage.

D. Provide and coordinate all casework that required mechanical and electrical connection and cut outs with Contract No. 15 Mechanical and Contract No. 17 Electrical.

E. Provide all counters for casework and stationary counters as shown. Provide metal counter supports as shown.

F. Provide all casework and counter tops and p-lam and solid surface wall caps that are noted. This contract to provide cut outs of all sinks, faucets and accessories. Templates to be provided by associated contractors. Wood, stained or painted, wall caps to be provided by Contract No. 5 Carpentry & General Work.

G. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

H. Provide all solid surface counter tops, wall caps, window sills and benches complete. Provide stationless steel tops, chem tops, etc..

I. Provide any bath accessories that are built in to casework.

J. Provide p-lam shelving in closets and all other shelving, casework and counters for this project. Also provide melamine shelves complete.

K. Provide manufactured laminate and wood casework, mail and literature distribution equipment, media shelving and casework including all accessories and connections complete.

L. Provide all science laboratory casework and all fixtures as noted in the specification section. Provide epoxy resin counters. Provide fume hood, chemical storage, etc..

M. Carpentry Contract No. 5 to provide wood shelving in closets only. All other shelving, casework and counters by this contract.

N. Provide all modular casework and all fixtures as noted in the specification section.

O. Provide plam or solid surface window sills and aprons complete. Also provide all p-lam and solid surface trims, bench seat tops and cubbies and any other items noted on documents.

P. Provide p-lam wall panels complete. They are noted in hallways and gym, etc..

Q. Provide both solid surface bench seat and wood veneer bench face.

R. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

S. See section 012300 Alternates and bid form for your responsibility for the alternates.

U. The intent of this scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

V. It is this contracts responsibility to review all other contracts scopes of work.

SCOPE OF WORK BID PAC A
CONTRACT NO. 14 KITCHEN EQUIPMENT

A. The administrative sections, prints, and addendums.

B. Trash can be placed in the jobsite dumpster provided by Construction Manager.

C. The kitchen equipment contractor is responsible for coordinating with all related trades. (i.e. mechanical, sprinkler, electrical, concrete and flooring).

D. The kitchen equipment contractor shall provide all kitchen equipment noted on the plans and specifications. Furnish and install complete.

E. This contractor is responsible for placing all equipment and receiving all equipment at the jobsite.

F. Provide all stainless steel work in the kitchen area.

G. This contract is responsible for coordinating installation of imbedded items with Contract No. 2 Concrete Work.

H. Temporary electrical service to your construction trailer to be powered by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

I. Mechanical, Sprinkler and Electrical contractors to provide hook up of equipment to their scope of work.

J. Provide hanging of kitchen hood complete. Mechanical contract will provide duct work and connections.

K. Items noted on documents are walk in freezer, microwave, HD bun drawer, HD grill, popcorn maker, beverage mechadiser, dishwasher, cheese dispenser, etc to be provided by this contract.

L. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your or your subcontractor are creating the infraction.

M. See section 012300 Alternates and bid form for your responsibility for the alternates.

N. The intent of this scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

O. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK – Bid Pac A
CONTRACT NO. 15 MECHANICAL
CONTRACT NO. 15 MECHANICAL IS TO INCLUDE ALL ITEMS DEFINED IN THE FOLLOWING CONTRACTS:
CONTRACT NO. 15A PLUMBING
CONTRACT NO. 15B HVAC

SCOPE OF WORK – Bid Pac A
CONTRACT NO. 15A PLUMBING

A. The administrative sections, prints, addendums and technical specification sections 033000. Technical specifications are noted on mechanical and plumbing contract drawings. Also, refer to electrical drawings for any mechanical or plumbing equipment.

B. Provide all plumbing complete including hook up to residential and commercial equipment including grease interceptor system, trench drains and dryer vents. Also provide caulking of plumbing fixtures to countertops, walls or other surfaces. Provide lavatory shields complete. Provide shower units and eyewashes complete.

C. Provide all testing and permits for the plumbing work. Provide chlorination on all water lines.

D. Provide Fire stopping and patching of wall, floor and ceiling areas that require mechanical penetration. Coordinate with other trades. Provide access panels and doors as required. This contract to install the access doors.

E. Provide all final connections from 5'outside of building to building for all site utilities. Includes water, sewer, and storm sewer.

F. It is the responsibility of the plumbing contractor to coordinate and inspect at the time of pour all imbedded mechanical items in concrete or masonry units for proper elevations and locations.

G. This contract is responsible to restore sub-grade to within 1"+ / - of final grade. Provide compaction and testing as required.

H. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

I. Provide gas piping and final connections and all related items.

J. Provide coordination of all plumbing penetrations with all trades involved. Hammer penetrations will not be tolerated. All wall penetrations to be patched prior to painting or cost for touch up paint to be deducted from contract.

K. Provide acid neutralization tank, water circulation pumps and domestic water booster and all connections and piping for a complete system.

L. Provide hook-ups and connections of kitchen equipment complete. All refrigerant piping associated with the walk in boxes shall be insulated and jacketed under this scope.

M. Coordinate the hook up with the storm water system provided by Contract No. 1 Site Work. Provide all final connections from 5'outside of building to building for all site utilities. Includes water, sewer, and storm sewer. Contract No. 1 Site Work will provide rain water conductor and cast iron rainwater boots.

N. In regards to coordination drawings, the plumbing contractor has the responsibility to coordinate all the trades and producing a coordination drawing showing all trades.

O. Provide two (2) gas regulators for kitchen equipment hook-up complete.

P. Provide gas and water piping and connections for science equipment. Provide emergency eye wash and showers.

Q. Provide coordination of all blocking needed for hanging and supporting of equipment with carpentry contract.

R. Provide all sleeves for piping complete.

S. Provide grease interceptor complete.

T. Plumbing contract is to provide demolition and installation of new concrete floor pads where plumbing items are relocated, demolished or added new.

U. Provide the selective demolition of all existing plumbing items. This will require the capping of the utilities. Provide removal of water.

V. Provide all pipe insulation, insulation coverings, valve insulation, labeling and identification of plumbing lines.

W. Excavation and backfill for underground plumbing work as detailed below is the responsibility of this Contractor. Soil types shall be in accordance with the contract documents (Geo-Tech reports included for reference and use)

X. Backfilling is the responsibility of this Contractor. Soil types shall be in accordance with project documents. It is the intent to use on site material and not imported fill. The use of this on site material shall conform with the compaction requirements identified in Section 312300. Excavated materials shall be covered immediately and protected from moisture mitigation. If Materials become unusable, this contractor shall own purchasing #10 stone dust to utilize as backfill in all trench or structure locations. Excess unsuitable materials from plumbing excavations shall be removed from the site by this contractor. (includes water meter pit installation) it is not acceptable for anu UG piping to e in the stone layer installed by the concrete contractor, all UG piping must be installed in the subbase with adequate soil coverage.

Y. Equipment bases and housekeeping pads identified on the structural drawings are to be provided by the Contract 2 concrete contractor. Any required pads or bases for the scope of this contract not identified on the documents will be provided by this contractor.

Z. Valve tags, charts and labeling shall be a part of this contractor’s responsibility complete.

AA. Provide roof drains, sumps and all related anchoring, support and adjustment that is required for your work complete.

BB. Gas piping, meter and pressure regulator valve. (Proper sizing of the regulators is the responsibility of this contractor.) Include anchoring this equipment to the concrete pad provided by Contract 2 concrete contractor and anchoring the piping and stand to the exterior wall.

CC. Provide complete water sterilization, testing and reporting complete.

DD. Provide water and air testing and balancing.

EE. Provide complete signed and sealed testing report prior to substantial completion and final inspection as required by Sussex County.

FF. This contractor has been allotted 30 days to complete all work and provide final, sealed balancing report by the Construction Manager. This contractor will need to work closely with the Construction Manager and all MEP trades to sequence work so that the completion of the balancing is completed in a manner that does not delay acceptance from by the owner.

GG. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your company or subcontractor creating the infraction.

HH. See section 012300 Alternates and bid form for your responsibility for the alternates.

II. The intent of this scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

JJ. It is this contractor's responsibility to review all other contract scopes of work.

SCOPE OF WORK – Bid Pac A
CONTRACT NO. 15B HVAC

A. The administrative sections, prints, addendums and technical specification sections 033000.. Technical specifications are noted on mechanical and plumbing contract drawings. Also, refer to electrical drawings for any mechanical or plumbing equipment.

B. Provide all HVAC work complete including all required louvers for the mechanical work. Provide fire dampers as required by all codes that apply. Louvers that is required for mechanical systems to be provided by Contract No. 15B Mechanical Complete. Contract No. 12 Joint sealant is responsible for the caulking of the louvers. Contract No. 5 Carpentry and General Work to provide all other louvers complete that are not required for mechanical equipment.

C. Testing and balancing of the HVAC system is to done by Contract 15B.

D. Provide Fire stopping and patching of wall, floor and ceiling areas that require mechanical penetration. Coordinate with other trades. Provide access panels and doors as required. This contract to install the access doors.

E. Provided all roof curbs for all mechanical items.

F. It is the responsibility of the mechanical contractor to coordinate and inspect at the time of pour all imbedded mechanical items in concrete or masonry units for proper elevations and locations.

G. This contract is responsible to restore sub-grade to within 1"+ / - of final grade. Provide compaction and testing as required.

H. This contract is responsible for all temporary heat as needed through duration of construction. See allowances.

I. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

J. Provide coordination of all mechanical penetrations with all trades involved. Hammer penetrations will not be tolerated. All wall penetrations to be patched prior to painting or cost for touch up paint to be deducted from contract.

K. Provide all concrete housekeeping pads for mechanical equipment as required.

L. Provide installation only of duct mounted smoke and heat detectors. Other Contractor will provide all control wiring as needed for a complete system as required by all codes that apply.

M. Provide hook-ups and connections of kitchen equipment complete. All refrigerant piping associated with the walk in boxes shall be insulated and jacketed under this scope.

N. Provide the allowance of $50,000 in the contract for temporary heat fuel cost. Cost of work to be determined by fuel company receipts with amount of fuel and cost per gallon. All equipment and labor for temporary heat is part of the contract. This allowance is for fuel cost only.

O. Provide painting of roof top equipment if noted.

P. Provide rooftop units, acoustical package, inertia pads, fire and smoke dampers, heat pumps, energy recovery ventilation, make-up air unit, air curtains, fans, pumps, unit heaters, circulating pumps, pumps, smoke vents, rooftop units, split heat pumps, fancoil units, VRF, radiant heaters, duct sox, duct liner, unit and split fumes and all other mechanical equipment complete.

Q. Provide the mechanical controls system complete including low voltage wiring and raceways. Electrical contractor will provide power only.

R. In regards to coordination drawings, the HVAC contractor has the responsibility to coordinate all the trades and producing a coordination drawing showing all trades.

S. Provide coordination of all blocking needed for hanging and supporting of equipment with carpentry contract.

T. Provide all sleeves for piping and ductwork complete.

U. Provide any ductwork to fume hood. Science fume hood provide by contract 13 Casework.

V. HVAC contract is to provide demolition and installation of new concrete floor pads where HVAC items are relocated, demolished or added new.

W. Provide smoke vents complete if connected to mechanical system. If not connected; Contract 6 roofing provides.

X. This contractor shall provide all raceways, conduits, pull strings and boxes required for the complete ATC system.

Y. Provide kitchen hood ventilation control system complete.

Z. This contractor shall include all piping, fittings, and connections required for the installation of the complete HVAC system.

AA. Provide all insulation, wraps, covers etc. for work of this contract. Include all labelling and identification markers as directed by the contract documents.

BB. Division 16 of the specifications should be reviewed as it relates to the power wiring and other requirements for HVAC equipment including the coordination of furnishing and installing motor starters as provided in the specifications.

CC. Pipe insulation, insulation coverings, valve insulation, labelling and identification of mechanical piping, ductwork, shafts, connections to systems etc. shall be provided by this contractor.

DD. Provide all colored piping if shown on the project documents..

EE. Roof curbs, rails, etc. to be provided and loaded to the roof by this contractor. Layout and installation by this contractor, coordinate with the carpentry contractor for blocking and the roofing contractor for flashing and roofing details. Include any doghouses or raceways for service lines, including coordination of flashing.

FF. Final connection of kitchen equipment and appliances related to the mechanical piping and HVAC system provided by this contractor. Coordination with other trades (Special Systems, Electrical, Fire Alarm etc.) for final interconnections of these systems shall be provided by this contractor.

GG. This contractor shall provide all required fire dampers, connections and remote controllers for the HVAC system.

HH. Provide all VFD's complete for electrical contractor to install.

II. Provide (3) sets of filters for construction use. Include changing out the filters during the construction phase. Additionally include a complete change out of all filters prior to turn over to the owner (these filters shall be separate from the attic stock filters required) Providing a complete filter listing as part of the closeout documents is required.

JJ. Coordinate with all other trades as required. Provide all instrumentation, controls, coordination of work, testing as required to provide a complete ATC system for this project. This work shall include but not be limited to instrumentation and controls for: Provide all instrumentation, controls, coordination of work, testing as required to provide a complete ATC system for this project.

KK. Provide electrical thermostats intended for automatic temperature controls with subbase or adapter plates to mount standard electrical box.

LL. Provide control wiring and or air piping required for all automatic temperature controls.

MM. Provide wiring for remote thermostats and remote prewired auxiliary control panels for packaged equipment.

NN. Provide the magnetic starter coil and relay coils intended for automatic temperature controls including interlocking between starts and relays when controlled automatically.

OO. Provide water and air testing and balancing.

PP. Provide complete signed and sealed testing report prior to substantial completion and final inspection as required by Sussex County.

QQ. This contractor has been allotted 30 days to complete all work and provide final, sealed balancing report by the Construction Manager. This contractor will need to work closely with the Construction Manager and all MEP trades to sequence work so that the completion of the balancing is completed in a manner that does not delay acceptance from by the owner.

RR. Provide confirmation of duct testing completed by Mechanical contractor.

SS. All concrete shown on structural drawings are to be provided by Contract 2 Concrete Work; any other housekeeping pads necessary for plumbing and/or HVAC equipment is to be provided by Contract 15/15A/15B.

TT. The gas supplier is to provide high pressure gas service up through regulator and meter assembly. Contractor shall extend from utility's meter/regulator assembly to the generators.

UU. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your company or subcontractor creating the infraction.

VV. See section 012300 Alternates and bid form for your responsibility for the alternates.

WW. The intent of this scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

XX. It is this contractor's responsibility to review all other contract scopes of work.

SCOPE OF WORK Bid Pac A
CONTRACT NO. 16 SPRINKLER SYSTEM

A. The administrative sections, prints, addendums, and technical specifications sections 033000. Technical specifications are noted on the mechanical and plumbing contract drawings. Also, refer to electrical drawings for any sprinkler equipment.

B. Provide any fire stopping required where your work penetrated walls. Provide access panels and doors as required. This contract is to install their own panels.

C. Provide all fire sprinkler/protection including, but not limited to, backflow preventers, sprinkler heads, piping, fittings, standpipe, fire department connection and fire pumps.

D. Submit all required calculations and applications for review and approval by Sussex County and State of Delaware Fire Marshals Office.

E. Provide all required flow switches, alarms, tamper switches, alarm clock valves, pipe, hangers, inserts, valves, fittings, fire department hose valves, access panels and access doors associated with your scope of work.

F. Coordinate with all effected trades', provide coordination information to other contracts.

G. Fire sprinkler contractor shall pick up all new water services from a flange 8" above finish floor in the fire pump room and other locations throughout the building.

H. Temporary electrical service to your trailer to be provided by this contract. A localized electrical panel will provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

I. Provide flushing for all interior and exterior fire water lines complete, including site for water lines installed by site work contractor.

J. Provide coordination of all sprinkler penetrations with all trades involved. Hammer penetrations will not be tolerated. All wall penetrations to be patched prior to painting or cost of touch up painting to be deducted from contract. Provide sleeves as required.

K. Provide any demolition of existing walls required to install piping. Patch and repair as necessary. Provide any fire stopping required where your work penetration walls.

L. Provide the cutting and patching of the concrete flooring to hook system to the waterlines. Patch concrete floors in a proper manner.

M. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your company or subcontractor creating the infraction.

N. See section 012300 Alternates and bid form for your responsibility for the alternates.

O. The intent of this scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

P. It is this contracts responsibility to review all other contract scopes of work.

SCOPE OF WORK Bid Pac A
CONTRACT NO. 17 ELECTRICAL

A. The administrative sections, prints, addendums, and technical specification sections 033000. Technical specifications are noted on the electrical contract drawings. Also, refer to mechanical and plumbing drawings for any technical equipment.

B. Provide temporary lighting as required for all areas of construction. Provide temporary electric service to all construction managers' office trailers. Trench wire in ground. Remove temporary service at completion of job.

C. Provide the patching and fire stopping required for any electrical penetration thru walls, ceilings and floors. Provide access doors and panels as required. This contract is to install their own panels.

D. Provide all rough-in and final electrical connections to the kitchen equipment, commercial and residential equipment and mechanical equipment.

E. Provide all equipment, material, testing, permits, and inspections required for a complete electrical system for the entire project.

F. Provide all concrete work for the installation of all electrical equipment.

H. Electrical contractor shall provide line power to fire alarm system as required by code.

I. Electrical contractor shall provide power to all electric door hardware. This shall include wall boxes and conduit where necessary. Electrical contractor shall coordinate with Hardware contract and alarm company. This shall include wall boxes, conduit and installation of control boxes. Low voltage wiring by others; electrical contractor is to provide line voltage to all electric door hardware.

J. Provide temporary distribution panel with six (6) 60-amp, 120/240 volt, single phase, 3-wire power for construction trailers for other contractors. Electrical hook-up, including conduit and wiring to trailer location shall be the responsibility of the Contractor requesting power not the Electrical Contract.

K. This contract is responsible to restore sub-grade to within 1" + / - of final grade.

L. If the Electrical contractor requires power for his construction trailer, he shall provide power to his trailer from the temporary distribution panel provided. Electrical contractor is responsible for all material, labor, and equipment necessary to extend power from panel to electrical site trailer. Electrical contractor shall make connection to panel

M. Provide all heat and smoke detector power wiring per all codes that apply.

N. Provide electrical connections for owner purchased equipment.

O. Provide final connection of all power wiring from building to the utility company connection point.

P. Provide all conduits, wire and all related material to install all underground electric utilities complete.

Q. Provide all site lighting complete including concrete bases, conduit, wire and fixtures. Also provide power to exterior score board.

R. Provide proper compaction and testing of all trenches associated with electrical work.

S. Provide coordination of all electrical penetrations with all trades involved. Hammer penetrations will not be tolerated. All wall penetrations to be patched prior to painting or cost of touch up painting to be deducted from this contract.

T. Provide lightning protection system complete.

U. Provide heat terminals complete.

V. Provide the demolition, patching and fire stopping required for any electrical penetration thru walls. Also provide the patching of areas where existing electrical penetrations are removed due to demolition.

W. Provide the saw cutting, demolition and repair for any floor areas required to run electrical work. Refer to Division 9 Flooring Sections in reference to floor finish tolerances.

X. Provide the demolition and revisions required for the site lighting to be revised, also provide demolition and revisions required for the utility pole systems.

Y. Provide relocation of site telephone box.

Z. Provide all work noted as by electrical contractor as noted in specification 11400 Food Service Equipment or is noted by general contractor but is part of electrical scope.

AA. Provide the patching and fire stopping required for any electrical penetration thru walls.

BB. Provide pathways, conduit, boxes, raceways, cable trays, floor boxes, distribution backboards, electrical protection, bonding and grounding and power supplies only for Telecommunication system, structured cabling, audio visual and sound systems and secondary systems. Also provide site conduit and pull boxes for technology and communications systems. Structured Cabling, and Security systems provided by others.

CC. Provide underground and overhead exterior electrical work including conduit, manholes and hand holes complete.

DD. Provide owners interactive display devices electrical requirements complete.

EE. Provide fire alarm system and all hardware for a complete system.

FF. Provide analysis and coordination study of electrical system.

GG. Provide electrical power to electric hand dryers.

HH. Provide all lighting for project including bollard lights.

II. Provide electrical power to security gates.

JJ. Provide relocation of utility poles and equipment complete. Coordinate with the utility company and include cost for utility company's fees for relocation.

KK. Electrical Scope Clarification –Division 27 & 28 Items

Provide pathway and boxes only to the following items:
Intercom and Clocks
Network Equipment
Telephone
ERR/DAS
Intrusion Detection
Access Control
Video Surveillance

LL. Provide the electrical telecom and alarm grounding and bonding system complete.

MM. In regards to coordination drawings, the electrical contractor has the responsibility to coordinate all the trades and producing a coordination drawing showing all trades.

NN. Provide pathways only for auditorium and broadcast A/V system complete, A/V system is to be provided by owner's vendor.

OO. Provide all lighting complete including the testing of lighting and control systems.

PP. Provide heat trace system complete.

QQ. Provide Electrical power to projector screens and roller shades complete.

RR. Provide Electrical power and lighting to all canopies complete.

SS. Provide Provide an Allowance of $25,000 in your price for analysis and coordination study of electrical system.

TT. Provide all concrete housekeeping pads for electrical equipment required.

UU. Provide pathways only for gym, aux system and cafeteria sound and video system; systems are to be provided by owner's vendor.

VV. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your company or subcontractor creating the infraction.

WW. See section 012300 Alternates and bid form for your responsibility for the alternates.

XX. The intent of this scope is **NOT** to denote every minute detail but to create an awareness of the scope of work for the project.

YY. It is this contracts responsibility to review all other contract scopes of work.

DELMARVA CHRISTIAN SCHOOL

SCOPE OF WORK Bid Pac A
CONTRACT NO. 18 WALL PANELS

A. The administrative sections, prints, addendums, and technical specification sections 074213, 076200.

B. Provide soffit, fasca and trim complete.

C. Provide composite and metal material wall panels, soffit and fascia complete including all furring, hat channel, z girts and fasteners and trims. Provide rain screen system. Also include mineral wool.

D. Provide all types of metal wall panels, metal composite panels, alucobond with rain screen, chamclad, laminated PVC panel, T LC-1 Metal Panel and metal trims complete including all flashings, connections, joint sealants and accessories. Provide hat track, clips and furring for all panels.

E. Provide the cladding support system complete.

F. Temporary electrical service to your construction trailer to be provided by this contract. A localized electrical panel will be provided for your power source. Removal of temporary electric is the responsibility of this contract at completion of job.

G. Provide z furring and metal strapping for soffits and siding.

H. Provide all caulking required for wall panels complete."

I. This contract is to provide payment to construction manager for any fines this contract or its subcontractors receive for OSHA violations where the construction manager is fined from OSHA due to your company or subcontractor creating the infraction.

J. See section 012300 Alternates and bid form for your responsibility for the alternates.

K. The intent of the scope is **NOT** to denote every minute detail but to create an awareness of the scope of for the project.

L. **It is this contractor's responsibility to review all other contract scopes of work.**

END OF SECTION 011100

SECTION 011200 – MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. This section describes certain responsibilities of the Contractors. These instructions shall be strictly followed unless more stringent requirements are contained within other Specification sections or written directions from the Construction Manager state otherwise.

Protection of Existing Conditions
Project Supervision
Project Coordination
Protection of Existing Conditions
Systems Coordination Drawings
Field Engineering
Testing
Fees, Licenses, and Permits
Sleeves, Hangers, and Inserts
Chases and Recesses
New and Existing Openings
Penetrations
Fireproof Repair
Equipment Foundations
Cutting and Patching
Access Doors and Panels
Touch-up Painting
Starters and Disconnects
Final Cleaning

1.2 PROTECTION OF EXISTING CONDITIONS

A. Existing finished surfaces to remain in place in the existing site, shall be protected by the Trade Contractor performing the work in that area, by whatever materials and means are required to prevent any damage. Other surfaces shall be protected with tarpaulins, drop cloths, and similar coverings, as required.

B. At the completion of the work, or when protection is no longer required, temporary enclosures, tarpaulins, building paper, drop cloths and other temporary materials, shall be removed and existing work and finishes in altered portions of the existing site shall be cleaned and left in condition acceptable to the Owner, Architect, and the Construction Manager.

1.3 PROJECT SUPERVISION

A. Every Trade Contractor shall be responsible for the supervision of their work. Adequate supervision as required to maintain the progress schedule, shall be required within the scope of work within the contracts. When more than one major building phase is being constructed at different locations on the project site, separate supervision must be assigned to each phase when work of that contract is being performed. When performing construction work to maintain the progress schedule requires extended hours, multiple shifts, and/or additional work days, adequate

separate supervision shall be required for each Trade Contractor during these times. The competence level and ability of supervisory personnel must be adequate to perform the construction activities involved.

B. Although these various second level supervision personnel may be reassigned from time to time, each contractor shall retain one superintendent with full responsibility while performing work on the project.

C. The Construction Manager shall have the authority to direct the Trade Contractor to assign additional supervisory personnel to ensure compliance with the contract schedule and quality requirements at no addition to the contract price.

1.4 PROJECT COORDINATION

A. Every Trade Contractor shall be responsible for the coordination of the progress of their work with the progress of all other Trade Contractors work.

B. Inasmuch as Project completion within the time limit is dependent upon cooperation of those engaged therein, it is imperative that each Trade Contractor perform his work at such time and in such a manner as not to delay or otherwise interfere with work progress of other Trade Contractors. If any Trade Contractor's work depends upon proper execution or results of another Trade Contractor's work, the former shall inspect the work and report any defects therein to the Construction Manager.

C. Trade Contractors shall afford each other every reasonable opportunity for installation of their work, and shall work in conjunction with each other in order to facilitate proper and intelligent execution of work.

D. Plans are generally diagrammatic, and each Trade Contractor shall coordinate his work with the work of others, so that interference between mechanical, electrical, architectural and structural work does not occur. Each Trade Contractor shall furnish and install offsets, bends, turns, and the like in connection with his work to avoid interference with work of other Trade Contractors, to conceal work where required, and to secure necessary clearance and access for operation and maintenance. In case of interference or lack of clearance and access, the Construction Manager will be notified immediately, and shall, in turn, notify the Architect. The Architect will decide which work shall be relocated, regardless of which was installed first.

E. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

F. Verify utility requirements and characteristics of operating equipment are compatible with utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

G. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.

H. After Owner occupancy, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.5 FIELD ENGINEERING

H. Inspection:

1. Each Trade Contractor shall confirm locations of survey control points prior to starting work. Promptly notify Construction manager of any discrepancies discovered.

2. The Trade Contractor shall verify all measurements of the site and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of differences between actual dimensions and the measurements indicated on the Drawings; any difference which may be found should be submitted to the Architect for consideration before proceeding with the work.

I. The Owner shall secure a professional engineer or surveyor licensed in the State of Delaware to perform the following:

1. Provide benchmark elevation to serve as the basis for the construction layout of the project.

J. Construction Layout:

1. The Sitework Trade Contractor shall be responsible to perform the layout and elevations required to complete his work.

2. The Site Concrete Work Trade Contractor shall layout to complete the scope of their work.

3. Each Trade Contractor shall layout the remainder of his own work and be responsible for all lines, levels, grades, elevations, and measurements.

1.6 TESTING

A. The owner shall employ and pay for the services of a testing agency to perform the required construction material testing for specification divisions 1 through 3. Refer to section 014000 Quality Control for testing agency qualifications and test reporting requirements.

1.8 FEES, LICENSES, AND PERMITS

A. The following permits shall be purchased by the Owner:

1. Building Permit

B. All remaining fees, licenses, and permits shall be obtained and paid for by the trade contractor requiring them at no additional cost to the Owner to complete their work.

1. Each respective contractor will be required to obtain license from the County of Sussex and the Town of Georgetown as required.
2. Additionally, all contractors are responsible to coordinate required applicable inspections.

1.9 SLEEVES, HANGERS, AND INSERTS

A. Each Trade Contractor shall furnish sleeves and inserts required to accommodate his work,

together with instructions regarding their placement and location in the structure. Sleeves and inserts shall be furnished promptly in accordance with the established construction schedule so that they may be built-in as construction progresses.

B. Trade Contractors to furnish all embeds, sleeves, inserts, etc., that are to be cast in concrete or built in masonry to the appropriate Trade Contractor for installation.

C. Each Trade Contractor shall furnish and install hangers required to accommodate his work.

1.10 CHASES AND RECESSES

A. Each Trade Contractor shall provide all blockouts shown on the Contract Documents and having either or both dimensions greater than 10" to the appropriate Trade Contractor for installation into his work. Any openings with dimensions smaller than 10" or not shown on drawings but required by a Trade Contractor shall be furnished and installed by the Trade Contractor requiring the same.

B. It is the responsibility of the Trade Contractors requiring openings, chases, etc., to furnish information regarding size and location promptly in accordance with the established construction schedule, so that they may be built-in as construction progresses and avoid delays. Failure to provide the information promptly will result in the responsible Trade Contractor incurring any cost associated with the delay and the installation.

C. Trade Contractors shall cooperate fully with each other in the performance of above work, as cutting and patching of new work is neither contemplated nor will it be tolerated.

1.11 NEW AND EXISTING OPENINGS

A. Upon removal of existing work, which penetrates floors, walls, or ceilings, openings shall be immediately closed with material matching that adjacent to the opening. This shall include whatever structural support is required. The closing of existing openings shall be performed by the Trade Contractor who is responsible to perform this work as if it is new construction.

B. Each Trade Contractor shall be responsible to install any new openings required to install his works in any existing construction and to furnish and install any additional structural support. All cutting and patching must be performed by journeymen or master trade mechanics for the trade work of the cutting/patching. Costs for all patching work are the responsibility of the trade contractor requiring the new opening.

C. This structural support shall maintain the structural integrity of the building.

D. Prior to cutting or drilling of any new openings that require additional structural support, the contractor shall submit a shop drawing to the Construction manager for review and acceptance by the Architect prior to demolition.

E. Openings required by any Trade Contractor in new construction shall be coordinated with the Trade Contractor(s) performing adjacent work.

1.12 PENETRATIONS

A. Each Trade Contractor shall be responsible to seal his own penetrations in walls, floors, and ceilings, using fire resistant materials, as required.

B. All roofing work shall be performed by the Roofing Trade Contractor, including patching penetrations made by the other Trade Contractors. Unless assigned specifically in section 011100 the cutting of roof openings, structural reinforcement, roof curbs, and counter flashing, shall be provided and installed by each Trade Contractor whose work penetrates the roofing surface, including all additional blocking associated with penetration.

1.13 FIREPROOF REPAIR

A. Existing and new spray-on fireproofing which is damaged by Trade Contractors shall be repaired by the Trade Contractor who caused the damage. The repair work shall be performed by tradesman qualified and certified to perform the repair.

1.14 EQUIPMENT FOUNDATIONS

B. The Concrete Work Trade Contractor shall provide all interior foundations and housekeeping pads indicated on the Contract Documents. The Sitework Concrete Contractor shall place all exterior equipment foundations and housekeeping pads indicated on the Contract Documents. All other foundations, equipment, and housekeeping pads not shown, but required, shall be by the Trade Contractor requiring the same.

C. Each Trade Contractor shall furnish anchor bolts and other accessories required to anchor his equipment in place, together with instructions regarding their placement and location in the foundation. Anchor bolts and other accessories shall be furnished promptly in accordance with the established construction schedule so that they may be built-in as construction progresses.

1.15 CUTTING AND PATCHING

A. Responsibility: A Trade Contractor requiring the cutting of openings in new work, or in the existing work installed by others shall have such openings cut and patched by the trade which installed the original work and such cutting and patching shall be at the expense of the Trade Contractor requiring the opening.

B. Approval: Approval to do such cutting and patching shall be received from the Architect through the Construction Manager prior to proceeding with the work. Approval of any structural cutting must be received from the structural engineer and architect before proceeding.

C. Inspection:

1. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
2. After uncovering, inspect conditions affecting performance of work.
3. If, in the course of cutting and patching the existing building for alteration work, a material is uncovered which appears to contain asbestos, the Contractor shall immediately notify the Construction Manager. Contractors shall perform other construction activities until the area in question can be cleared.

D. Preparation:

1. Provide supports to assure structural integrity of surroundings, devices, and methods, to protect other portions of Project from damage.
2. Provide protection from elements for areas which may be exposed by uncovering work.

E. Performance:

1. Execute work by methods to avoid damage to other work and which provide proper surfaces to receive patching and finishing.
2. Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements and sight-exposed surfaces.
3. Restore work with new products in accordance with requirements of Contract Documents.
4. Fit work tightly to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
5. At penetrations of fire-rated wall, ceiling or floor construction, completely seal voids with fire-resistant materials as required to achieve fire-rating indicated.
6. Where fire protection materials are damaged or removed, reapply fire protection materials to achieve a rating equivalent to existing construction or as noted.
7. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

1.16 ACCESS DOOR AND PANELS

A. Access doors and panels, shown on architectural drawings, shall be furnished and installed by each Trade's Contractor whose product needs to be accessible.

B. Access doors and panels shall be furnished by the trade contractor requiring access and delivered to the Drywall and Metal Studs Trade Contractor for installation.

1.17 FINAL CLEANING

A. Trade Cleaning: Each contractor is responsible for final cleaning their own work as outlined in Section 011100 - Summary of Work. This initial cleaning must be completed before requesting inspection for Certification of Substantial Completion. This cleaning shall include, but not be limited to:

1. Clean surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces.
2. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned. Comply with Product manufacturer instruction and recommendations.
3. Within limits of Contract, clean site, sweep paved areas, rake clean landscaped surfaces.
4. Provide additional cleaning as required within individual Specification sections.
5. Remove waste and surplus materials, rubbish and construction facilities from the site. Dispose of in a legal manner.
6. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
7. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
8. Wipe down all walls, equipment, fixtures, casework and shelving to a dust-free sanitary condition.

9. Sweep, vacuum and mop all floors.
10. Clean all windows, glass and glazing.

1.18 TOUCH-UP PAINTING

A. The Caulking and Painting Contractor shall coordinate and schedule his final coat as directed by the Construction Manager to reduce the amount of touch-up painting required.

B. After the final coat has been applied, all touch-up paint and patching required to repair damage caused by other trade shall be reviewed by the Construction Manager and paid for from the construction contingency or back charged to the Trade Contractor who the Construction Manager determines is responsible.

1.19 STARTERS AND DISCONNECTS

A. The Electrical Contractor shall furnish and install starters, power and starter control wiring per the electrical drawings and the specifications. The Electrical Contractor shall furnish and install starters in the motor control center.

B. Individual starters and disconnects shown on other drawings and specifications shall be furnished by that Trade Contractor and will be installed and connected by the Electrical Contractor.

END OF SECTION 011200

SECTION 011216 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Products and installation for patching and extending work.

B. Transition and adjustments.

C. Repair of damaged surfaces, finishes, and cleaning.

1.2RELATED SECTIONS

A. Section 013100 – Project Management and Coordination: Work sequence, owner occupancy, maintenance of utility services.

B. Section 015000 – Temporary Construction Facilities and Temporary Controls: Temporary enclosures, protection of installed work, and cleaning during construction.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

A. New Materials: As specified in product sections; match existing Products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing Products where necessary, referring to existing Work as a standard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that demolition is complete and areas are ready for installation of new Work.

B. Beginning of restoration Work means acceptance of existing conditions.

3.2 PREPARATION

A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

C. Remove debris and abandoned items from area and from concealed spaces.

D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.

E. Close openings in exterior surfaces to protect existing work and salvage items indicated from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

3.3 INSTALLATION

A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

B. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring Products and finishes to original condition.

C. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.

D. Project, Designated Areas, Rooms and Spaces, and Finishes: Complete including operational mechanical and electrical work.

E. In addition to specified replacement of equipment and fixtures, restore existing plumbing, heating, ventilation, air conditioning, electrical, and other systems to full operational condition.

F. Re-cover and refinish work that exposes mechanical and electrical work exposed accidentally during the work.

G. Install Products as specified in individual sections.

3.4 TRANSITIONS

A. Where new work abuts or aligns with existing, perform a smooth and even transition. Patch Work to match existing adjacent work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect/Engineer.

3.5 ADJUSTMENTS

A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

B. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Architect/Engineer review.

C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

D. Fit work at penetrations of surfaces as specified in Section 024500.

3.6 REPAIR OF DAMAGED SURFACES

A. Patch or replace portions or existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

B. Repair substrate prior to patching finish.

3.7 FINISHES

A. Finish surfaces as specified in individual Product sections.

B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.8 CLEANING

A. In addition to cleaning specified in Section 015000, clean Owner occupied areas of work.

END OF SECTION 011216

SECTION 011400 - WORK RESTRICTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 USE OF PREMISES

A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy of site.

2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.3 OCCUPANCY REQUIREMENTS

A. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will provide, operate, and maintain mechanical and electrical systems serving occupied portions of building.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011400

SECTION 012000 – PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Measurement and payment criteria applicable to portions of the Work performed under a unit price payment method.

B. Defect assessment and non-payment for rejected work.

1.2 AUTHORITY

A. Measurement methods delineated in the individual specification sections complement the criteria of this section.

B. Take all measurements and compute quantities. The Construction Manager will verify measurements and quantities.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

1.3 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form as defined in individual Specification sections are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Construction Manager shall determine payment.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.

C. If the actual Work requires a 10 percent or greater change in quantity than those quantities indicated, the Owner may claim for a Contract Price adjustment.

1.4 MEASUREMENT OF QUANTITIES

A. Measurement Devices:

1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
3. Metering Devices: Inspected, tested and certified by the applicable State department within the past year.

B. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

C. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

D. Measurement by Area: Measured by square dimension using mean length and width or radius.

E. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

F. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.5 PAYMENT

A. Payment Includes: Full compensation for all required labor, Products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item or the Work; overhead and profit.

B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Architect/Engineer multiplied by the unit sum/price for Work which is incorporated in or made necessary by the Work.

1.6 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Architect, it is not practical to remove and replace the Work, the Architect will direct one of the following remedies:

1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of the Architect.
2. The defective Work will be partially repaired to the instructions of the Architect, and the unit sum/price will be adjusted to a new sum/price at the discretion of the Architect.

C. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.

D. The authority of the Architect to assess the defect and identify payment adjustment is final.

1.7 NON-PAYMENT FOR REJECTED PRODUCTS

A. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected Products.

1.8 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1.01, **Satisfactory fill in Place:** Indicate cost to provide satisfactory fill in place, furnished, placed and compacted `Unit of Measurement: cubic yards

B. Unit Price No. 1.02, **Stone in place:** Indicate cost to provide stone in place and compacted. Unit of Measurement: cubic yards

C. Unit Price No. 1.03, **Geo-Fabric in place:** Indicate cost to provide Geo-Fabric in place Unit of Measurement: Square yards

D. Unit Price No. 1.04, **Undercut & disposal (mass):** Indicate cost for mass excavation & disposal. Unit of Measurement: Cubic yards

E. Unit Price No. 1.05, **Undercut & disposal (trench):** Indicate cost for trench excavation & disposal. Unit of Measurement: Cubic yards.

F. Unit Price No. 1.06, **Select (trench) Backfill:** Indicate cost to provide satisfactory trench fill furnished, placed and compacted. Unit of Measurement: cubic yards.

G. Unit Price No. 1.07, **Top soil:** Indicate cost to provide top soil in place and compacted Unit of Measurement: cubic yards.

H. Unit price 1.08, **Removal of unsuitable soil and replacement of suitable soil,** Indicate cost to remove, disposed of unsuitable unclassified materials, and to provide, place and compact suitable soil**.** Unit of Measurement: cubic yards.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 012000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements due to unknown conditions or to defer selection of actual materials and equipment and/or installation to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Unit-cost allowances.
3. Quantity allowances.
4. Contingency allowances.
5. Testing and inspecting allowances.

C. Related Sections include the following:

1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
2. Division 1 Section "Unit Prices" for procedures for using unit prices.
3. Division 1 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
4. Divisions 2 through 35 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials selected by Architect or specified herein and shall include taxes, freight, and delivery to Project site.

B. Related costs for Supervision, field operation and temporary facilities; general overhead; profit; bond premiums; and taxes. costs are part of the Contract Sum.

1.7 TESTING AND INSPECTING ALLOWANCES

A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.

B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.

C. Costs of services not required by the Contract Documents are not included in the allowance.

D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.8 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1 (Contract 1 Site Work): Include the lump sum of the following amount $100,000 in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager.

B. Allowance No. 2 (Contract 2 Concrete Work): Include the lump sum of following amount $25,000 in the contract for cold weather protection of concrete work. Cost of work to be determined on a time and material basis.

C. Allowance No. 3 (Contract 3 Masonry Work): Include the lump sum of following amount $25,000 in the contract for cold weather protection of masonry work. Cost of work to be determined on a time and material basis.

D. Allowance No.4 (Contract 5 Carpentry & General Work): Include the lump sum of the following amount $100,000 in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager.

E. Allowance No. 5 (Contract 5 Carpentry & General Work): Include the lump sum of the following amount $25,000 in the contract for temporary enclosures as described in Section 015000 Temporary Construction Utilities, Facilities & Control Item 3.14 Enclosures

F. Allowance No.6 (Contract 4 Steel Work): Include the lump sum of the following amount $25,000 in the contract for unforeseen conditions that may arise during construction to be used at the discretion of the Construction Manager.

G. Allowance No. 7 (Contract 15 & 15B Mechanical): Include the lump sum of following amount $50,000 in the contract for temp. heating fuel cost. Cost of work to be determined by fuel company receipts with the amount of fuel and cost per gallon. All equipment and labor for temp heat is part of the contract. This allowance is for fuel cost only.

H. Allowance No.8 (Contract 16 Electrical): Include the lump sum of the following amount $25,000 in the contract for analysis and coordination study of electrical system..

END OF SECTION 012100

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. Related Sections include the following:

1. Division 1 Section "Allowances" for procedures for using unit prices to adjust quantity allowances.
2. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

A. Unit price is **an amount proposed by bidders, stated on the Bid Form, as** a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased. **Owner reserves the right to reject unit prices submitted with bid deemed unreasonable.**

B. Unit prices include necessary material, overhead, profit and applicable taxes.

C. Unit price shall include all costs related or required for the complete installation, including the cost of material and delivery; installation labor including fringe benefits, insurance, social security, workmens' compensation; rental value of equipment and machinery; incidental expense, supervision, field operation and temporary facilities; general overhead; profit; bond premiums; and taxes.

D. Material only unit price shall include the cost of material and shipping. All other Contractor's costs including storage, handling, labor; equipment and machinery; supervision; temporary facilities; general overhead; profit; bond premiums; and taxes shall be included in the contract sum and not the allowance.

E. Refer to individual Sections for construction activities requiring establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, **applicable taxes,** overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A **"Unit Price Schedule"** is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials and methods described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Unit Price No. 1.01, **Satisfactory fill in Place:** Indicate cost to provide satisfactory fill in place, furnished, placed and compacted `Unit of Measurement: cubic yards

B. Unit Price No. 1.02, **Stone in place:** Indicate cost to provide stone in place and compacted. Unit of Measurement: cubic yards

C. Unit Price No. 1.03, **Geo-Fabric in place:** Indicate cost to provide Geo-Fabric in place Unit of Measurement: Square yards

D. Unit Price No. 1.04, **Undercut & disposal (mass):** Indicate cost for mass excavation & disposal. Unit of Measurement: Cubic yards

E. Unit Price No. 1.05, **Undercut & disposal (trench):** Indicate cost for trench excavation & disposal. Unit of Measurement: Cubic yards.

F. Unit Price No. 1.06, **Select (trench) Backfill:** Indicate cost to provide satisfactory trench fill furnished, placed and compacted. Unit of Measurement: cubic yards.

G. Unit Price No. 1.07, **Top soil:** Indicate cost to provide top soil in place and compacted Unit of Measurement: cubic yards.

H. Unit price 1.08, **Removal of unsuitable soil and replacement of suitable soil,** Indicate cost to remove, disposed of unsuitable unclassified materials, and to provide, place and compact suitable soil**.** Unit of Measurement: cubic yards.

END OF SECTION 012200

SECTION 012300 – ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

2. Alternate to include all labor, material, overhead and profit as associated with work required. Work shall be executed concurrent with the project schedule.

3. Base bid shall include all work in any subtractive Alternates specified herein

4. All pricing for alternates shall remain valid for a period of 90 days after receipt of bids

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or

deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate 1: Mechanical Roof Screens
   1. The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
      a. All mechanical roof screens
   2. The following remains in scope and shall be considered part of the base bid:
      a. Primary roof structural steel for mechanical roof screen support.

B. Alternate 2: Polished Concrete Floor Finish
   1. The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
      a. All polished concrete finish.
   2. The following remains in scope and shall be considered part of base bid:
      a. All sealed concrete flooring.

C. Alternate 3: Middle School Corridor Lockers
   1. The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
      a. All lockers
   2. The following remains in the scope and shall be considered part of the base bid:
      a. Wall, floor, and base behind locker assemblies.

D. Alternate 4: Locker Room Lockers
   1. The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope.
      a. All athletic lockers.
   2. The following remains in scope and shall be considered part of the base bid:
      a. All floor finished under the locker assemblies
      b. All wall and base behind locker assemblies.

E. Alternate 5: Cable Trays
   1. The following shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
      a. All Cable trays.
   2. The following remains in scope and shall be considered part of the base bid.

a. All low voltage wiring.

F. Alternate 6: Epoxy Flooring in Science Labs
1. The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
a. All epoxy flooring in science labs.
b. All epoxy base in science labs.
2. The following remains in scope and shall be considered part of the base bid:
a. Sealed concrete in all science labs
b. Rubber base assemblies in science labs.

G. Alternate 7: Early Learning Center
1. The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
a. Early Childhood Center in its entirety.
2. The following remains in scope and shall be considered part of the base bid:
a. Site work required for Early Childhood center building pad.

H. Alternate 8: Performance & Payments Bonds
1. The following items shall be excluded from base bid and shall be listed as an add alternate to the base contract scope:
a. Cost to provide a performance and payment bond for contract.
2. The following items remain in scope and shall be considered part of base bid:
a. No bonds on base bid.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime contractor.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Reference Standards and Definitions" specifies the applicability of industry standards to products specified.
2. Division 1 Section "Submittals" specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.
3. Division 1 Section "Materials and Equipment" specifies requirements governing the Contractor's selection of products and product options.

1.3 DEFINITIONS

A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
2. Revisions to the Contract Documents requested by the Owner or Architect.
3. Specified options of products and construction methods included in the Contract Documents.
4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

A. Substitution Request Submittal: The Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Architect.

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

    a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors that will be necessary to accommodate the proposed substitution.
    b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
    c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
    d. Samples, where applicable or requested.
    e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    f. Cost information, including a proposal of the net change, if any in the Contract Sum.
    g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
    h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

4. Architect's Action: If necessary, the Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Architect will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.

    a. Use the product specified if the Architect cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Conditions: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect will return the requests without action except to record noncompliance with these requirements.

    1. Extensive revisions to the Contract Documents are not required.
    2. Proposed changes are in keeping with the general intent of the Contract Documents.
    3. The request is timely, fully documented, and properly submitted.
    4. The specified product or method of construction cannot be provided within the Contract Time. The Architect will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
    5. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.

6. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
11. Where a proposed substitution involves more than one prime contractor, each contractor shall cooperate with the other contractors involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of products.

B. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 012500

SUBSTITUTION REQUEST

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: [] New product [] 2-5 years old [] 5-10 yrs old [] More than 10 years old

Differences between proposed substitution and specified product: _____

_____

_____

[] Point-by-point comparative data attached - REQUIRED BY A/E

Reason for not providing specified item: _____

_____

Similar Installation:

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: [] No [] Yes; explain _____

_____

Savings to Owner for accepting substitution: _____ ($ _____).

Proposed substitution changes Contract Time: [] No [] Yes [Add] [Deduct] _____ days.

Supporting Data Attached: [] Drawings [] Product Data [] Samples [] Tests [] Reports [] _____

SUBSTITUTION REQUEST

The Undersigned certifies:

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

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: _____

_____

_____

_____

A/E's REVIEW AND ACTION

[] Substitution approved - Make submittals in accordance with Specification Section 01330.
[] Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
[] Substitution rejected - Use specified materials.
[] Substitution Request received too late - Use specified materials.

Signed by: Date:

Additional Comments: [] Contractor [] Subcontractor [] Supplier [] Manufacturer [] A/E [] _____

_____

_____

_____

_____

_____

_____

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections include the following:

1. Division 1 Section "Unit Prices" for administrative requirements for using unit prices.
2. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect or Construction Manager will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
2. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.

2. Submit the Schedule of Values to Architect through the construction manager at earliest possible date but no later than 14 days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section or Division.
    b. Description of the Work.
    c. Name of subcontractor.
    d. Name of manufacturer or fabricator.
    e. Name of supplier.
    f. Change Orders (numbers) that affect value.
    g. Dollar value.

        1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and Construction Manager and paid for by Construction Manager.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Construction Manager and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use AIA Document G702/CMa and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Construction Manager will return incomplete applications without action.

    1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit 4 signed and notarized original copies of each Application for Payment to Construction Manager by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Construction Manager reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

    a. Submit final Application for Payment with or proceeded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Submittals Schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. List of Contractor's principal consultants.
8. Copies of building permits.
9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
10. Initial progress report.
11. Report of preconstruction conference.
12. Certificates of insurance and insurance policies.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 012973 – SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-0 Specification Sections, apply to this section.

1.2 CONTRACT SUM BREAKDOWN

A. Within ten (10) days of receipt of Contract, each Trade Contractor shall submit to the Construction Manager for review a Contract Sum Breakdown, the total of which shall be equal to the initial contract sum.

B. The General Trade Contractor shall list quantities and unit prices that correspond to the activities he is responsible for. All unit prices should include labor, tools, equipment, overhead, and profit required to perform a complete installation.

1.3 FORM AND CONTENT

A. The breakdown shall be prepared on the forms provided with this Section. The schedule shall also indicate:

1. Title of project and location
2. Architect's name
3. Name and address of Contractor
4. Date of submission

B. Provide a separate line item for General Conditions which would include home office support, bonds, insurance premiums, mobilization, field supervision, temporary construction utilities, facilities, and controls.

1. Contractor must include line item amounts for General Condition Requirements as follows:

Submittals
Progress Meetings
Clean up
Progress Schedule Development
Coordination Drawing
Project Record Drawings

2. Breakdown of major construction activities shall be submitted per building wing, per floor, separating labor and material values.

END OF SECTION 012973

SECTION 013100 – PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Coordination.
B. Field engineering.
C. Preconstruction meeting.
D. Site mobilization meeting.
E. Progress meetings.
F. Preinstallation meetings.
G. Examination.
H. Preparation.

1.2 RELATED SECTIONS

A. Section 011216 – Alteration Project Procedures.

1.3 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Verify utility requirements and characteristics of operating equipment are compatible with utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean up of work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.

F. After Owner occupancy, co-ordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.4 FIELD ENGINEERING

A. Contractor to locate and protect survey control and reference points.

B. Control datum for survey is that established by Owner and shown on drawings.

C. Verify set-backs and easements, confirm drawing dimensions and elevations.

D. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

1.5 PRECONSTRUCTION MEETING

A. Construction Manager will schedule a meeting after Notice of Award.

B. Attendance Required: Owner, Architect/Engineer, Contractors.

C. Agenda:

1. Submission of executed bonds and insurance certificates.
2. Distribution of Contract Documents.
3. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule not previously required.
4. Designation of personnel representing the parties in contract, Architect and other Consultants.
5. Procedures and processing of field decisions, submittals, substitutions, Applications for Payments.
6. Scheduling.
7. Scheduling activities of inspection and testing service.

D. Construction Manager will record minutes and distribute copies within two days after meeting to participants, with copies to those affected by decisions made.

1.6 SITE MOBILIZATION MEETING

A. Construction Manager shall schedule a meeting at the project site prior to Contractor occupancy.

B. Attendance Required: Owner, Architect/Engineer, Special Consultants, Contractor, Contractors Superintendent, major Subcontractors, and other parties as required.

C. Agenda:

1. Use of premises by Owner and Contractor.
2. Owner’s requirements and occupancy.
3. Construction facilities and controls provided by Owner.
4. Temporary utilities provided by Owner.
5. Survey and layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Procedures for testing.
9. Procedures for maintaining record documents.
10. Requirements for start-up of equipment.
11. Inspection and acceptance of equipment put into service during construction period.

D. Construction Manager shall record minutes and distribute copies within two days after meeting to participants, with copies to Architect/Engineer, Owner, participants, and those affected by decisions made.

1.7 PROGRESS MEETINGS

A. Construction Manger shall schedule and administer meetings throughout progress of the work at weekly intervals unless otherwise required by the work.

B. Construction Manger shall make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required: Job superintendents, Prime Trade Contractors, Owner, Architect/Engineer, Special Consultants as required and parties as appropriate to agenda topics for each meeting.

D. Agenda

1. Review minutes of previous meetings.
2. Review work progress.
3. Field observations, problems, and decisions.
4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Current safety changes.
14. Other business relating to Work.

E. Construction Manager shall record minutes and distribute copies within two days after meeting to participants, with copies to Architect / Engineer, Owner, participants, and those affected by decisions made

1.8 PREINSTALLATION MEETING

A. When required in individual specification sections, the respective Contractor shall convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting or affected by, work of the specific section.

C. Notify Architect, Owner and Construction Manager four days in advance of meeting date.

D. Contractor shall prepare agenda and preside at meeting:

1. Review conditions of installation, preparation and installation procedures.
2. Review coordination with related work.

E. Record minutes and distribute copies within five days after meeting to participants, with copies to Architect, Owner, Construction Manager, participants, and those affected by decisions made.

1.9 ADDITIONAL MEETING

A. The Construction Manager may conduct additional meetings as required by the Project conditions or changes. All contractors must attend these meetings at no additional cost to the Owner.

B. Daily Coordination meeting of approximately 15 minute duration will be conducted by the Construction Manager for all Contractor's superintendents on site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Beginning new work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specifications sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct location.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply any manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION 013100

SECTION 013113- PROJECT COORDINATION

PART I - GENERAL

1.1 SECTION INCLUDES

A. Project coordination by the Project Coordinator.
B. Construction Mobilization.
C. Schedules.
D. Submittals.
E. Coordination drawings.
F. Closeout procedures.

1.2 RELATED SECTIONS

A. Document 007226- General Conditions – AIA G232-2009 CM/A: Duties of the Construction Manager.

B. Document 007300- Supplementary Conditions of the Contract.

C. Section 011100 - Summary of Work: Work covered by each Contract. Work sequence. Owner occupancy.

D. Section 013100 - Coordination and Meetings: Project meetings. Pre-construction Meetings. Progress meetings.

F. Section 013300 - Submittals: Submittal procedures.

F. Section 017700- Contract Closeout: Contract Closeout Procedures.

1.3 PROJECT COORDINATOR

A. Project Coordinator: Construction Manager.

1.4 CONSTRUCTION MOBILIZATION

A. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field office and
sheds, for construction and Owner access, traffic, and parking facilities.

B. During construction, coordinate use of site and facilities through the Project Coordinator.

C. Comply with Project Coordinator’s procedures for intraproject communications; submittals, reports and records, schedules, coordination drawings and recommendations; and resolution of ambiguities and conflicts.

D. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

1.5 SCHEDULES

A. Submit preliminary manpower loaded bar chart schedule in accordance with Section 01310.

B. After review, revise and resubmit schedule to comply with revised Project schedule.

C. During progress of work, revise and resubmit with Applications for Payment or as directed.

1.6 SUBMITTALS

A. Provide submittals to Project Coordinator for review and transmittal to Architect / Engineer.

B. Submit requests for interpretation of Contact Documents, and obtain instructions through the Project Coordinator.

C. Process requests for substitutions, and change orders, through the Project Coordinator.

D. Deliver closeout submittals for review and preliminary inspection reports, for transmittal to

I .7 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Systems Coordination Drawings are required from the Mechanical, Electrical, Plumbing and General
Trade Contractors with the lead role assigned to the Mechanical Trade Contractor.

C. The Mechanical Trade Contractor shall prepare 1/4” = 1 ft. scale Reproducible Systems Drawings for all areas with piping and ductwork. Drawings to indicate spatial relationship HVAC piping and ductwork.

D. The Mechanical Trade Contractor shall prepare and submit to the Construction Manager a regularly updated schedule indicating the development and review of these drawings with other Trade Contractors. The drawing development and review schedule must follow the project construction schedule.

E. The Mechanical Trade Contactor shall provide the Reproducible Systems Coordination the other Trade Contractors for their input and review. The routing is as follows: HVAC Ductwork / Piping, Plumbing, General Trades with the drawings being reamed to be Contractor.

F. Each Trade Contractor will add the work of his Contract on the Systems Coordination Drawings to -avoid interferences. All piping, equipment, light fixtures and in-ceiling equipment, such as rolling gates, must be shown on these drawings to include elevations and dimensions.

G. Prior to forwarding the Systems Coordination Drawings to the next Trade Contractor, an approval stamp, initialed and dated, should be affixed by the reviewing Trade Contractor. This approval by the reviewing Trade Contractor will install his work accordingly.

H. During the Systems Coordination Drawing process, the Construction Manager will conduct regularly scheduled meetings. Each Trade Contractor is required to attend these meetings. The Construction Manager is responsible for recording and distributing meting minutes to all Trade Contractors and the Architect / Engineer. The purpose of the meetings will be to review and discuss interferences and conflicts as well as any modifications to the Systems Coordination Drawings, All resolutions of interferences and conflicts which required modifications shall be initiated by the appropriate Trade Contractors on the Systems Coordination Drawings. At each meeting, the General Trade Contractors will review and update the Systems Coordination Drawing Schedule.

I. Once reviewed and approved by each General Trade Contractor, the Mechanical Trade Contract will prepare the Final Reproducible Systems Coordination Drawings with the work of all trades included. Submit the Reproducible Drawings along with two (2) prints to the Construction Manager who will forward to the Architect for his review.

J. The Mechanical Trade Contractor shall indicate any unresolved conflicts or interferences on the Systems Coordination Drawings. Those should be delineated by clouding, numbering and referencing to he affected contract drawings,

K. Review drawings prior to submission to Architect / Engineer.

L. The Architect will review and return drawings to the Construction Manager. The Construction Manager will distribute the number of drawings to the Trade Contractors for installation of their work.

M. The Systems Coordination Drawings DO NOT REPLACE any fabrication and layout drawings required by individual Specification Sections.

1.8 CLOSEOUT PROCEDURES

A. Notify Project Coordinator when work is considered ready for Substantial Completion. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractors Notice of Substantial Completion.

B. Comply with Project Coordinator’s instructions to correct items of work listed in executed Certificates of Substantial Completion and for access to Owner occupied areas.

C. Notify Project Coordinator when Work is considered finally complete. Accompany

Project Coordinator on preliminary final inspection.

D. Comply with Project Coordinators instructions for completion of items of Work determined by Architect / Engineers final inspection.

PART 2 - PRODUCTS – (NOT USED)

PARTS - EXECUTION— (NOT USED)

END OP SECTION 013113

SECTION 013216 - CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Scheduling requirements and coordination.

B. Construction Phasing Plans

C. Construction Milestone Schedules (by Phase and by Trade)

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

1.3 DEFINITIONS

A. Activity: An activity is any single identifiable step in the Project. It depends upon preceding and succeeding activities.

1.4 CONSTRUCTION SCHEDULE

A. The Construction Schedule, as reviewed by the Construction Manager and Owner, will be an integral part of the Contract, and will establish interim work completion dates for the various activities. Each Trade Contractor shall be responsible to achieve Starting Dates, Milestones or Target Dates, and Completion Dates established for each Phase of the overall Project.

B. The Construction Schedule may vary in accordance with construction conditions. Each Contractor shall delay or expedite material and equipment deliveries, and modify the required labor forces to accommodate these varying conditions.

C. This is a phased project. Multiple trips may be required to complete this Project.

D. Within fifteen (15) days after receipt of Notice of Intent to Award, each Contractor shall submit a preliminary Construction Schedule, in accordance with the milestone construction schedule included in these documents under the summary of work, to the Construction Manager. The schedule will include breakdowns of total man days of field labor into major categories of work, time estimates of various categories of work, crew size for each category, and quantity and type of equipment to be utilized.

E. Each Contractor shall provide to the Construction Manager a separate list of critical submittal dates for Shop Drawings, Product Data, and Samples, indicating delivery dates/lead times that may impact the construction schedule or completion of the Work. The critical submittal list shall accompany the Preliminary Submittal List as identified in Section 013300 - Submittals.

F. Each Contractor shall organize his Construction Schedule per Phase, Building, Wing, Floor, and Area as required by the Construction Manager.

G. The Construction Manager shall schedule a meeting with the Contractors, to review the contents of each Contractor's preliminary Construction Schedule, review the sequence of Work, and make all revisions required. The Construction manager shall have the final authority concerning the sequence of Work and durations of each activity. Each Contractor shall revise his schedule in accordance with that meeting and submit his schedule to the Construction Manager for review. The Construction Manager will then develop the Project Construction Schedule. Each Contractor shall schedule and perform his work in compliance with the Construction Manager's Project Construction Schedule.

H. The Schedule shall be the basis for the dates to start and complete Work for the various portions of each Contract, and to complete Work (including changes) for the Project. IT shall be the duty of the Contractor to conform to the current Schedule and to arrange his work in such a manner that it will be installed in accordance with the Schedule.

I. Each Contractor shall submit two (2) copies of a monthly updated Construction Schedule comparing the original schedule to actual work in progress and project work along with the Application for Payment.

J. As required, a representative of each Contractor shall meet with the Construction Manager and furnish to him information necessary for such re-evaluating and updating of the Project schedule. Information with regard to changes in the work and the Contractor's proposed effort to overcome any delays incurred shall be provided (in writing) to the Construction Manager.

K. Two (2) days after the Contractor has failed to Start on Schedule, Meet Assigned Milestone or Target Dates, or Completion of items such as Shop Drawing Submissions, Material - Equipment Deliveries, or Tasks according to the Master Construction Schedule or Revised Master Construction Schedule, the Construction Manager will forward a letter of Non-Conformance, via Facsimile Transmission and/or forward a letter of Non-Conformance, via Facsimile Transmission and/or Express Mail, to the Contractor and a copy to the Owner. Upon receipt of this notice, the Contractor is required to execute whatever measures as so directed by the Contract Manager including, but not specifically, assigning additional labor, shifts, overtime, materials, expediting of submittals or deliveries, equipment, scaffold, or any combination of these as deemed appropriate and necessary by the Construction Manager to return the above referenced activities back on schedule, without additional compensation to the Contractor.

L. Costs incurred by the Construction Manager in connection with maintaining the Construction Schedule, caused by the Contractor's noncompliance with the scheduling requirements, shall be reimbursed to the Construction Manager by the Contractor.

M. It is expressly understood and agreed that failure by the Construction Manager to exercise the option to either order the Contractor to expedite work, or to expedite the work by other means, shall not be considered precedent-setting for any other activities.

1.5 SCHEDULE COMPUTERIZATION

A. All Trade Contractors shall provide all their scheduling information via a computer assisted scheduling program, acceptable to the Construction Manager. Format to be Bar Chart.

B. All schedule information and updates for the above Contractors shall be provided to the

Construction Manager on 3.5" diskettes in format and density as required.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

PART 4 – SCHEDULE

Construction starts June 2025. Project has to be finished by August 2027
Please provide sufficient manpower in your cost to meet the completion date of August 1, 2027.

END OF SECTION 013216

SECTION 013233 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Daily construction reports.
5. Field condition reports.
6. Special reports.
7. Construction photographs.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting the Schedule of Values.
2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
3. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
4. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor activity is an activity that must be completed before a given activity can be started.

B. Event: The starting or ending point of an activity.

C. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

D. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

E. Major Area: A story of construction, a separate building, or a similar significant construction element.

F. Milestone: A key or critical point in time for reference or measurement.

G. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.4 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

B. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's and Construction Manager’s final release or approval.

C. Preliminary Construction Schedule: Submit three printed copies.

D. Contractor's Construction Schedule: Submit two printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.

E. Daily Construction Reports: Submit two copies at weekly intervals.

F. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

G. Special Reports: Submit two copies at time of unusual event.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures

related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations, content, and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, and interim milestones.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review submittal requirements and procedures.
11. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

C. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities including temporary lighting.

D. Each trade contractor is to submit preliminary manpower loaded bar chart schedule in accordance with section 013100.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to

maintain orderly progress of the Work and those required early because of long lead-time for manufacture or fabrication.

a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 120 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than 7 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect and Construction Manager’s administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
4. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

a. Subcontract awards.
b. Submittals.
c. Purchases.
d. Mockups.
e. Fabrication.
f. Sample testing.
g. Deliveries.
h. Installation.
i. Tests and inspections.
j. Adjusting.
k. Curing.
l. Startup and placement into final use and operation.

5. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

a. Structural completion.
b. Permanent space enclosure.
c. Completion of mechanical installation.
d. Completion of electrical installation.
e. Substantial Completion.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

1. Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.

G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

H. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within 14 days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. High and low temperatures and general weather conditions.
5. Accidents.
6. Meetings and significant decisions.
7. Unusual events (refer to special reports).
8. Stoppages, delays, shortages, and losses.
9. Meter readings and similar recordings.
10. Emergency procedures.
11. Orders and requests of authorities having jurisdiction.
12. Change Orders received and implemented.
13. Construction Change Directives received.
14. Services connected and disconnected.
15. Equipment or system tests and startups.
16. Partial Completions and occupancies.
17. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, and response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting Applications for Payment.
2. Division 1 Section "Project Coordination" for submitting Coordination Drawings.
3. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 1 Section "Quality Control" for submitting test and inspection reports and Delegated-Design Submittals.
5. Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.
6. Division 1 Section "Closeout Procedures" for submitting Record Drawings, Record Specifications, Record Product Data, and operation and maintenance manual requirements.
7. Division 1 Section "Substitutions for submitting products substitutions during bidding and after Award of Contract.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. General: **Upon request,** Architect will provide electronic copies of CAD Drawings of the Contract Drawings for Contractor's use in preparing submittals. **Contractor shall sign a release form provided by the Architect and payment of $200 processing fee for each consultant’s CADD files. Only plan drawings and backgrounds to be provided**

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
3. **All submittals by suppliers and fabricators shall be reviewed by Installing Contractor for compliance and coordination with other work prior to submission to the architect. Contractor's failure to review shop drawings and product data will be cause for rejection.**

C. Submittals Schedule: Comply with requirements in Division 1 Sections "Construction Progress Documentation" and "Construction Schedules" for list of submittals and time requirements for scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.

1. Initial Review: Allow not less than 15 working days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is required, allow not less than 21 working days for initial review of each submittal.

3. If intermediate submittal is necessary, process it in same manner as initial submittal.

4. Allow 15 working days for processing each re-submittal.

5. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

6. All contractors to provide all submittals and color samples to the Construction Manager within 45 days of your contract date. Any rejected submittals to be resubmitted within 15 days. A penalty of $100.00 per calendar day will be accessed for late submittals and color samples.

E. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches (100 by 125 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Name and address of Architect.
d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Submittal tracking number based on specification section
i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Other necessary identification.

F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of subcontractor, manufacturer, and supplier.
f. Submittal tracking number based on specification section
g. Category and type of submittal.
h. Submittal purpose and description.
i. Submittal and transmittal distribution record.
j. Remarks.
k. Signature of transmitter.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit number of copies requested but not less than seven copies of each submittal, unless otherwise indicated. Architect will return two copies plus copies for maintenance binders. Mark up and retain one returned copy as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Mill reports.
j. Standard product operating and maintenance manuals.
k. Compliance with recognized trade association standards.
l. Compliance with recognized testing agency standards.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.

d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1000 mm).

D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."

E. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.
2. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
3. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side that includes the following:

a. Generic description of Sample.
b. Product name or name of manufacturer.
c. Sample source
d. Project Name
e. Date.

4. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.

a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections,

operation, and similar construction characteristics.

5. Number of Samples for Verification: Submit minimum three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

    a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

F. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.
4. Project identification as described in submittal procedures above.

G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.
4. Project identification as described in submittal procedures above.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

J. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

K. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

L. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

M. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

N. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures Operation and Maintenance Data."

P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

R. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

T. Within 15 working days of award of contract and notice to proceed each prime the contractor shall provide written confirmation that Contractor shall comply with requirements contained herein. Architect of record shall then provide (1) six pack of beer as selected by the contractor.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

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

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 013300

BGWARCHITECTS
Innovative design. Stewardship driven.

4/10/2025

(Insert client name),

At your request, we will provide electronic files for your convenience and use in the preparation of shop drawings related to Delmarva Christian School, subject to the following terms and conditions:

Data contained on these electronic files are part of our instruments of service and shall not be used by you or anyone else receiving these data through or from you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against us, our officers, directors, employees, agents or sub-consultants that may arise out of or in connection with your use of the electronic files. Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold us harmless against all damages, liabilities or costs, including reasonable attorneys' fees and defense costs, arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by us and the electronic files, the signed or sealed hard-copy construction documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because information presented on the electronic files can be modified, unintentionally or otherwise, we reserve the right to remove all indication of ownership and/or involvement from each electronic display.

We will furnish you electronic files of the following:

- [Sheet No.] [Sheet Description and BGW Architects Job No.]

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, of the merchantability and fitness for any particular purpose. In no event shall we be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

Name:

Company:

Signature: _____

BGW ARCHITECTS
2909 Washington Blvd | Ogden, UT
www.bgwservices.com

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SECTION 013319 FIELD ENGINEERING

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work on this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Architect for consideration. Those judged to be equal to that specified will receive written approval.

C. Delaware Department of Transportation Specifications for Road and Bridge Construction, August 2001 and as amended.

D. Delaware Department of Natural Resources and Environmental Control (DNREC) Sediment and Stormwater Regulations.

1. 2 SUMMARY

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

A. The Contractor shall be responsible for all stakeouts and elevation checks required for construction. All such Work shall be performed by a professional land surveyor. The surveyor shall verify adequacy of benchmarks before starting construction.

B. Before the start of any building construction, the Contractor shall have a professional land surveyor locate and stake building corners, driveway entrances, driveways, parking areas and playfields. If there are any discrepancies between the actual layout and the project site plan, they shall be brought to the attention of the Architect and resolved before Work proceeds. A building and site stake out drawing stamped and signed by a professional land surveyor may be submitted in lieu of this preliminary stake out.

C. After the corners of the exterior walls have been started, the Contractor shall obtain a wall check survey certificate made by a professional land surveyor. This survey shall show the accurate location of the building with reference to property lines.

D. After the first sections of slab-on-grade have been placed in the building, the Contractor shall have a professional land surveyor verify and record the finish floor elevations on the wall check survey.

E. At the end of the project, the Contractor shall have a professional land surveyor prepare and certify an as-built survey showing the accurate horizontal and vertical locations of all building corners, paved areas, sidewalks, utilities (including inverts), fencing, site walls, etc. located within the project area.

F. As-Built survey shall be included in a standard C.A.D. format such as AutoCad and/or MicroStation and shall include 2-foot contours within the project limits.

G. A complete stormwater management as-built shall also be completed in accordance with DNREC's Standard Stormwater Management checklist. The Contractor's shall have a professional land surveyor prepare and certify an interim and final as-built, and the testing and inspection agent shall have a professional engineer certify the construction checklist at the interim and final stages of stormwater management facility construction.

H. The contractor will be responsible for preparing and submitting to the project engineer five (5) copies of the interim and final stormwater management facility as-built, and additional facility information in accordance with the requirements set forth by DNREC.

1.3 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Additional requirements for field engineering also may be described in other Sections of these Specifications.

1.4 QUALITY ASSURANCE

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

1.5 SUBMITTALS

A. Comply with pertinent provisions of Section 013300-Submittals.

B. Upon request of the Architect, submit;

1. Data demonstrating qualifications of persons proposed to be engaged for field engineering services.

2. Documentation verifying accuracy of field engineering work.

3. Certifications, signed by the Contractor's retained field engineer, certifying that elevations and locations of improvements are in conformance with requirements of the Contract Documents.

4. All certifications and surveys described in the Summary section of this specification.

1.6 PROCEDURES

A. In addition to procedures directed by the Contractor for the proper performance of the Contractor's responsibilities:

1. Locate and protect control points before starting Work on the site.

2. Preserve permanent reference points during process of the Work.

3. Do not change or relocate reference points or items of the Work without specific approval from the Architect.

4. Promptly advise the Architect when a reference point is lost or destroyed, or requires relations because of other changes in the Work.

a) Upon direction of the Architect, require the field engineer to replace reference stakes or markers.

b) Locate such replacements according to the original survey control.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

Not Applicable

END OF SECTION 013319

SECTION 013500 - SAFETY

1.1 SAFETY REQUIREMENTS

A. All work shall be performed in accordance with rules, regulations, procedures and safe practices and/or OSHA and all other Government agencies having jurisdiction over the project.

1.2 SAFETY PRECAUTIONS AND PROGRAMS:

A. Each Contractor shall be responsible for initiating, maintaining and supervising safety precautions and programs in connection with the work. The name of the safety officer for each contractor shall be provided to the Construction Manager.

B. All Contractors shall comply with the provisions of the "Occupational Safety and Health Act" and Federal, State and local requirements.

C. If a Contractor fails to maintain the safety precautions required by law or directed by the Construction Manager, the Construction Manager may take such action as necessary and charge the Contractor therefore. The failure of the Construction Manager to take any such action shall not relieve the Contractor of his obligations.

D. The Contractor individually shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods and for any damage which may result from their failure or their improper construction, maintenance or operation.

E. Prior to mobilizing to the job, the Contractor shall submit to the Construction Manager in writing, a description of his safety program for review and comment. Failure of the Construction Manager to make any changes shall not relieve the contractor of his obligations. During the conduct of the work, the Contractor shall immediately notify the Construction Manager in writing of all accidents and shall submit a written report describing in detail the circumstances of each accident within 24 hours of its occurrence.

F. All Contractors shall notify the Construction Manager of any flammable, combustible and/or toxic materials intended for use on the project and shall furnish the Construction Manager with literature pertinent to the use and control of all materials, including, but not limited to M.S.D.S. sheets.

G. Each Contractor shall delegate one representative who shall be responsible to maintain all safety requirements of the Contractor, and shall attend all project meetings scheduled by the Construction Manager.

1.3 SAFETY OF PERSONS AND PROPERTY:

A. The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage or loss to:

1. All Lewes Public Library personnel and all other persons who may be affected thereby.

2. All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-Subcontractors.

3. Other property at the site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction and underground property.

B. The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority, including the Owner's requirements bearing on the Safety of persons or property or their protection from damage, injury or loss.

C. The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including danger signs and other warnings against hazards. He shall comply with safety regulations and notify the Construction Manager, until he is in compliance.

D. The Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the Contractor, his Subcontractors, his Sub-Subcontractors, or anyone directly employed by any of them, or by anyone for whose acts any of them be liable.

E. The Contractor shall not load or permit any part of the work to be loaded so as to endanger its integrity and safety.

F. Contractors using a method of blasting to perform work on the project shall use all proper methods, including adequate safety matting and/or overburden, progressive time sequences and scaled distances, in accordance with all governmental regulations.

G. The use of audio equipment and headsets will not be permitted on the construction site.

1.4 PERSONAL PROTECTION REQUIREMENTS

A. All persons entering the project shall wear hard hats in good condition and meet ANSI Z89.1-1981 and ANSI Z89.2-1971. The hats shall be worn in the proper manner.

B. All persons entering the project shall wear proper work boots, clothing attire including long trousers and shirts.

C. All job site personnel are expected to strictly adhere to the following rules and regulations:

1. Use of approved eye protection by all Company personnel shall be required during all types of percussions and reciprocating work or when owner requirements govern.

2. Approved respiratory equipment shall be worn by all personnel exposed to hazardous volumes of toxic or noxious dusts, fumes, mists, or gases. Check

M.S.D.S. if not sure.

3. Personal protective equipment is to be used under unusual conditions, such as high temperature work, handling caustic or corrosive liquids, or molten metals.

4. When lifting material, keep back straight, bend knees, and lift with your legs. Get help if the load is too heavy.

5. Work clear of suspended loads. If a load is moved above where your are working or walking, stand clear until it has passed.

6. Unless it is part of your regular work, do not attempt to repair or adjust any electrical equipment.

7. Kill any circuit before attempting to work on it. Even voltages lower than 110 will cause death under certain conditions.

8. Treat all electric wires as live. Do not touch exposed wires. Report them immediately to your supervisor.

9. The Contractor is responsible for providing safety training to all of his employees.

10. All shipments to the site shall have the required documentation and labels attached and the documentation and labels shall be maintained while the material is on site.

11. As defined in the occupational Safety & Health Act, safety belts, complete with lanyards, or parachute-style harness, complete with lanyard, are to be used where there is a danger of falling.

1.5 HOUSEKEEPING

A. Materials and equipment must be piled up or stored in a safe manner. Aisles must be kept clear.

B. All drop cables/extension cords shall be elevated above the ground or protected in such a way to allow traffic to pass.

C. Smoking will only be permitted in designated areas.

D. Consumption of food and beverages in other than Company-designated areas and at specified times.

E. Glass-bottled refreshments will not be allowed in the workplace.

F. Graffiti will not be tolerated on the jobsite.

G. All compressed gas cylinders must be stored in an upright position and tied off with the

cap placed on top.

H. The cords and connections at temporary panels must be maintained in an orderly fashion at all times to prevent tripping.

I. Welding stubs and shells from explosive activated tools shall be collected and properly disposed of by Contractor.

J. Nails are to be bent over and/or removed from wood.

K. Aisles and stairwells as well as base areas of ladders are to be kept clear at all times.

1.6 M.S.D.S.-CONTROLLED PRODUCTS

A. The Contractor is responsible for notifying R.Y. Johnson & Son, Inc of any controlled products that they bring or cause to have brought onto the site. The Contractor shall provide R.Y. Johnson & Son, Inc. with a copy of the Material Safety Data Sheet (M.S.D.S.) for the controlled product, and the Contractor shall retain a copy of the M.S.D.S. on site for their reference. The legal storage, use, and disposal of any controlled product is the responsibility of the Contractor.

B. The Contractor shall comply with OSHA Communications' Standards 29 CFR 1910-1200 for hazardous materials. The Contractor shall maintain a Material Safety Data Sheet on file at the jobsite for each chemical brought to the site. M.S.D.S. sheets shall be submitted to R.Y. Johnson & Son, Inc. for record purposes.

C. Temporary storage of hazardous materials shall be located in containment dikes provided by the Contractor requiring same in area identified by the Construction Manager. All tanks, drums, and containers are to be labeled with appropriate warnings (i.e., flammable, no smoking). Periodic inspections for leakage shall be the responsibility of the Contractor. Final cleanup and removal shall be by the Contractor.

1.7 EMERGENCIES

A. In any emergency affecting the safety or persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss and shall immediately notify the Construction Manager of such emergency conditions. Any claims made by the Contractor for additional compensation or extension of time on account of emergency work shall be processed in accordance with Article 7, of the Supplementary Conditions.

1.8 ACCIDENT INVESTIGATION AND REPORTING

A. All accident/incidents shall be reported.

B. The Contractor shall submit an accident/incident report to R.Y. Johnson & Son, Inc. no later than 10 hours on the working day following the incident. A detailed report is to follow within 24 hours.

1.9 FIRST AID PROCEDURE

A. The Contractor is to provide his own First Aid service.

B. Each Contractor shall supply to R.Y. Johnson & Son, Inc. a list of their qualified First Aid personnel. Each Contractor is to have a minimum of one full-time qualified First Aid personnel on site. Contractor First Aid certificates shall be posted in the Contractor's site office and photocopies supplied to R.Y. Johnson & Son, Inc.

1.10 INDEMNIFICATION

A. Contractors shall indemnify and hold harmless the Owner, the Construction Manager and the Architect/Engineer, all municipal authorities, and their agents and employees from and against all claims, damages, losses, and expenses including, but not limited to attorney's fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other work than the work itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not is caused in part by a party indemnified hereunder.

B. In any and all claims against the Owner, the Construction Manager or the Architect/Engineer or any of their agents or employees by any employee of a Contractor, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the type of damages, compensation or any Subcontractor under workmen's compensation acts, disability benefit acts or other employee benefit acts.

C. To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Construction Manager, the Owner, and the Architect and their agents and employees from and against all claims, including citations and penalties imposed by the Occupational Safety and Health Administration, damages, losses, expenses and judgments including, but not limited to attorneys' fees, arising out of or resulting from performance of the work in an area which is unsafe, harmful, dangerous, or hazardous and which is caused in whole or in part by any act or omission of the Contractor, anyone directly or indirectly employed by it, or anyone for whose acts it may be liable, regardless of whether the claim, citation, penalty, damage, loss, expense or judgment results from unsafe, harmful, dangerous, hazardous or toxic materials or substances or whether from any other unsafe, harmful, dangerous or hazardous conditions.

D. The obligations of the Contractor under this paragraph shall not extend to the liability of the Architect/Engineer or the Construction Manager, his agents or employees arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, design or specifications, or (2) the giving of or the failure to give directions or instructions by the

Architect/Engineer of the Construction Manager, their agents or employees provided such giving or failure to give is the primary cause of the injury or damage.

E. No provision of this Subparagraph shall give rise to any duties on the part of the Architect or the Construction Manager not otherwise provided for by contract or by law.

F. In the event that any party is requested but refuses to honor the indemnity obligations hereunder, then the party refusing to honor such requests shall, in addition to all other obligations, pay the cost of bringing any such action, including attorney's fees to the party requesting indemnity.

END OF SECTION 013500

SECTION 014000 - QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality-control services.

B. Quality-control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Architect.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
3. Requirements for Contractor to provide quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

E. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Cutting and Patching" specifies requirements for repair and restoration of construction disturbed by inspection and testing activities.
2. Division 1 Section "Submittals" specifies requirements for development of a schedule of required tests and inspections.

1.3 RESPONSIBILITIES

A. Contractor Responsibilities: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.

1. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.

B. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.

C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

1. Provide access to the Work.
2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
4. Provide facilities for storage and curing of test samples.
5. Deliver samples to testing laboratories.
6. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
7. Provide security and protection of samples and test equipment at the Project Site.

D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Architect and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.

1. The agency shall notify the Architect and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
3. The agency shall not perform any duties of the Contractor.

E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.4 SUBMITTALS

A. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Architect. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:

    a. Date of issue.
    b. Project title and number.
    c. Name, address, and telephone number of testing agency.
    d. Dates and locations of samples and tests or inspections.
    e. Names of individuals making the inspection or test.
    f. Designation of the Work and test method.
    g. Identification of product and Specification Section.
    h. Complete inspection or test data.
    i. Test results and an interpretation of test results.
    j. Ambient conditions at the time of sample taking and testing.
    k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
    l. Name and signature of laboratory inspector.
    m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.

    1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.

C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION 014000

SECTION 014100- REGULATORY REQUIREMENTS

PART I - GENERAL

1.1 SECTION INCLUDES

A. Safety and Health Regulations.

B. Housekeeping.

C. M.S.D.S. Controlled Products.

D. Emergencies.

E. Employment Policy.

F. Environmental Statutes and Regulations.

G. Miscellaneous Regulations.

I. Standard of Quality.

I.2 RELATED SECTIONS

A. General and Supplementary Conditions of the Contract.

I.3 SAFETY AND BEALTH REGULATIONS

A. These Contract Documents and the joint and several phases of construction hereby contemplated are to be governed, at all lines by applicable provisions of the Federal law(s), including but not limited to, the latest amendments of the following:

1. Williams-Steiger Occupational Safely and Health Act of 1970, Public Law 91-596,
2. Part 1910 - Occupational Safety and Health Standards, Chapter XIII of Title 29, Code of Federal Regulations.

B. Nothing contained in these Contract Documents for construction shall be construed by the Contractor as relieving him in any way of his responsibility for strict compliance with the rules and regulations contained in the above mentioned Occupational Safety and Health Act.

C. The use of products containing asbestos will not he permitted.

D. All work shall be performed in accordance with rules, regulations, procedures and safe practices and/or OSHA
and all other Government Agencies having jurisdiction over the project.

E. Each Contractor shall be responsible for initiating, maintaining and supervising safety precautions and programs in connection with the work. The name of the safety officer for each contactor shall be provided to the Construction Manager.

F. All Contractors shall comply with the provisions of the Occupational Safety and Health Act and Federal, State and local requirements.

G. If a Contractor fails to maintain the safety precautions required by law or directed by the Construction Manager, the Construction Manager may take such action necessary and charge the Contractor therefore. The failure of the Construction Manager to take any such action shall not relieve the Contractor of his obligations.

H. The Contractor individually shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods and for any damage which may result from their failure or their improper construction, maintenance or operation.

I. Prior to mobilizing to the job, the Contractor shall submit to the Construction Manager in writing, a description
of his safety program for review and comment. During the conduct of the work, the Contractor shall immediately notify the Construction Manager in writing of all accidents and shall submit a written report describing in detail the circumstances of each accident within 24 hours of its occurrence.

J. All Contractors shall notify the Construction Manager of any flammable, combustible and/or toxic materials intended for use on the project and shall famish the Construction Manager with literature pertinent to the use and control of all materials, including, but not limited to M.S.D.S sheets.

K. Each Contractor shall delegate one representative who shall be responsible to maintain all safety requirements of the Contractor, and shall attend all project meetings scheduled by the Construction Manager.

L. The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage or loss to: -

1. All school personnel, employees on the work site and all other persons who may be affected thereby.
2. All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or
Sub-Subcontractors.
3. Other property at the site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction and underground property.

M. The Contractor shall give all notices and comply with all applicable laws, ordinances**,**

rules, regulations and lawful orders of any public authority, including the Owner's requirements bearing on the Safety of persons or property or their protection from damage, injury or loss.

N. The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including danger signs and other warnings against hazards. He shall comply with safety regulations and notify the Construction Manager, until he is in compliance.

O. The Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the Contractor, his Subcontractors and his Sub-Subcontractors or anyone directly employed by any of them, or by anyone for whose acts any of them be liable.

P. The Contractor shall not load or permit any part of the work to be loaded so as to endanger its integrity and safety.

Q. Contractors using a method of blasting to perform work on the project shall use all proper

R. The use of audio equipment and headsets will not be permitted on the construction site.

S. All persons entering the project shall wear hard hats in good condition and meet ANSIZ89.1-1981 and
ANSI Z89.2-1971. The hats shall be worn in the proper manner.

T. All persons entering the project shall wear proper work boots, clothing attire including long trousers and shirts.

U. All job site personnel are expected to strictly adhere to the following rules and regulations:

I. Use of approved eye protection by all company personnel shall be required during all types of percussions and reciprocating work or when owner requirements govern.
2. Approved respiratory equipment shall be worn by all company personnel exposed to hazardous volumes of toxic or noxious dusts, fumes, mists, or gases. Check M.S.D.S. if not sure.
3. Personal protective equipment is to be used under usual conditions, such as high temperature work, handling caustic or corrosive liquids or molten metals.
4. When lifting material, keep bask straight, knees bent, and lift with your legs. Get help if the load is
too heavy.
5. Work clear of suspended loads. If a load is moved above where you are working or walking, stand clear until it has passed.
6. Unless it is part of your regular work, do not attempt to repair or adjust any electrical equipment.
7. Kill any circuit before attempting to work on it. Even voltages lower than 110 will cause death under certain conditions.
8. Treat all electric wires as live. Do not touch exposed wires; report them immediately to your supervisor.
9. The Contractor is responsible for providing safety training to all of his employees.
10. All shipments to the site shall have the required documentation and labels attached and the documentation and labels shall be maintained while the material is on site.

11. As defined in the Occupational Safety & Health Act, safety belts, complete with lanyards or
parachute style harness, complete with lanyards, are to be used where there is a danger of falling.

1.4 HOUSEKEEPING

A. Materials and equipment must be piled up or scored in a safe manner. Aisles must be kept clear.

B. All drop cables/extension cords shall be elevated above the ground or protected in such a way to allow traffic to pass.

C. Smoking will only he permitted in designated areas.

D. Consumption of food and beverages in other than Company-designated areas and at specified times are prohibited.

E. Glass-bottled refreshments will not be allowed in the workplace.

F. Graffiti will not be tolerated on the job-site.

G. All compressed gas cylinders must be stored in an upright position and tied off with the cap placed on top.

H. The cords and connections at temporary panels must be maintained in an orderly fashion at all times to prevent tripping.

I. Welding stubs and shells from explosive activated tools shall be collected and properly disposed of by the Contractor.

J. Nails are to be bent over and/or removed from wood,

K. Aisles and stairwells as well as base areas of ladders are to be kept clear at all times.

1.5 M.S.D.S.-CONTROLLED PRODUCTS

A. The Contractor is responsible for notifying R.Y. Johnson Construction Management of any controlled products that they bring or cause to have brought onto the site. The Contractor shall provide
RY. Johnson Construction Management with a copy of the Material Safety Sheet (M.S.D.S.) for the controlled product and the Contractor shall retain a copy of the M.S.D.S. on site for their own reference. The legal storage, use, and disposal of any controlled product is the responsibility of the Contractor.

B. The Contractor shall comply with OSHA Communication Standards 29 CFR 1910-1200 for hazardous materials. The Contractor shall maintain a Material Safety Data Sheet on file at the job-site for each chemical brought to the site, M.S.D.S. sheets shall be submitted to R.Y. Johnson Construction Management for record purposes

C. Temporary storage of hazardous materials shall be located in containment dikes provided by the Contractor requiring same in area identified by the Construction Manager. All tanks, drums, and containers are to be labeled with appropriate warnings (i.e., flammable, no smoking). Periodic inspections for leakage shall he the responsibility of the Contractor. Final clean-up and removal shall be by the Contractor.

1.6 EMERGENCIES

A. In any emergency affecting the safety or persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss and shall immediately notify the Construction Manager of such emergency conditions. Any claims made by the Contractor for additional compensation or extension of time on account of emergency work shall be processed in accordance with Article 7, of the Supplementary Conditions.

I.7 EMPLOYMENT POLICY

A. Acceptance of a contract based on these specifications constitutes agreement by the Contractor to comply with State Policy as established by joint Resolution No. 16 of the General Assembly of l958, which is: That on all public works being paid for in whole or in part with State or other public funds, preference shall be given to available persons who have been residents of Delaware for a period of at least six (6) months immediately prior to availability of positions for employment of laborers, mechanics and others, not including supervisor personnel not to exceed ten percent (10%) of the total working force.

B. Competent Workmen: No person shall be employed to perform any work under the Contract who is not a competent and first-class workman or mechanic, as applicable. For purposes of this section, no workman or mechanic, as applicable, shall be regarded as competent and first class unless he shall be duly skilled in the applicable branch of labor and shall be paid not less than such rates of wages and for such hours work as shall be established and current rates of wages paid for such hours by employers of organized labor in performance of similar work in the locality where the work is to be performed.

C. It is understood that the provisions of Title VI of the Civil Rights Act 1964 are hereby included in this contract to the end that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or otherwise subjected to discrimination under this Agreement.

The Contractor agrees to make such reports and to maintain and make available, such records as may be required to ensure compliance with ART.38, par. b and c. - this means permitting access by appropriate State or Federal officials during normal business hours to such facilities, records and other sources of information as may be pertinent to ascertain compliance with the regulations.

D. All Contractors shall be subject to, and responsible for all costs relating to Contractor licensing ordinances and regulations.

1.8 ENVIRONMENTAL STATUES AND REGULUATIONS

A. Contractor shall comply with all applicable provisions of federal and state laws dealing with the prevention of environmental pollution and the preservation of natural resources, including but not limited to Act No 247 approved October 26, 1962; the Federal Air Quality Act of 1967; the Clean Air Act; the Clean Water Restoration Act; the Water Pollution Control Act Amendments of 1956; the Water Quality Act of 1965; the Water Quality Improvement Act of 1970; The Water Pollution Control Act Amendments of 1972; The Water Facilities Act (see Consolidated Farmer's Home Administration Act of 196l); the Watershed Protection and Flood Prevention Act; the Pennsylvania Air Pollution Control Act; the Clean Streams Law; the Solid Waste Management Act; the Municipal Waste Planning, Recycling and Waste Reduction Act; A.H.E.R.A.; and all rules and regulations there under, including, but not limited to, those formulated by the United States Environmental Protection Agency, the Pennsylvania Department of Environmental Resources and the Department of Environmental Protection. Nothing contained in the Contract shall be construed as relieving Contractor in anyway of Contractors
responsibility for strict compliance with all governmental requirements pertaining to environmental protection.

B. These Contact Documents and the joint and several phases of construction hereby contemplated are to be governed, at all times, by applicable provisions of Federal and State Law(s) dealing with the prevention of environmental pollution and the preservation of public natural resources, including but not limited to the latest amendments of the following:

1. Act No. 247 of the General Assembly oft he Commonwealth of Pennsylvania relating to the prevention of environment pollution and the preservation of public natural resources in construction projects, enacted October 26, 1972.

C. Pursuant to Act No. 247 of the 1972 Pennsylvania General Assembly, all proposals will be subject to all the provisions of all Federal and State statutes dealing with the prevention of pollution and preservation of public natural resources including, but not limited to; the Federal Air Quality Actor 1967; Clean Air Act, as amended: Clean Water Restoration Act; Water Pollution Control Act Amendments of 1956, Water Quality Act or 1965, Water Quality improvement Act of 1970. and Water Pollution Control Mt Amendments of 1972; the Water Facilities Act (see Consolidated Farmers Home Administration Act of 1961); the Watershed Protection and Flood Prevention Act; the Pennsylvania Air Pollution Control Act; Clean Streams Law; Solid Waste Management Act; Sewerage Facilities Act; and all rules and regulations there under including, but not limited to, those formulated by the United States Environmental Protection Agency and the Pennsylvania Department
of Environmental Resources.

D. Act No. 247 provides that if the successful bidder must undertake additional work due to enactment of new or the amendment of existing statues, rules or regulations occurring after the submission of the successful proposal, the Authority shall issue a change order setting for the additional work that must be undertaken, which shall not invalidate the contract. The cost of such a change

order to the Authority shall be determined in accordance with the provisions of the contract for change orders or force accounts, or if n such provision is set forth in the contract, then the cost to the Authority shall be the contractors costs for wages, labor costs other than wages, wage taxes, materials,
equipment rentals, insurance and subcontractors attributable to the additional activity plus a reasonable sum for overhead and profit; provided however, that such additional costs to undertake work not specified in the invitation for proposal shall not be approved unless written authorization is given the successful bidder prior to his undertaking such additional activity. In the event of a dispute between the Authority and the successful bidder, arbitration procedures maybe commenced under the applicable
terms of the construction contract, or, if the contract contains no such provision for arbitration, the then obtaining rules of the American Arbitration Association. I

E. Nothing contained in the Contract Documents for construction shall be construed by the Contractor as relieving him in any way of his responsibility for strict compliance with the statutes, rules and regulations contained in the above mentioned Environmental Protection Act.

l.9 MISCELLANEOUS REGULATIONS

A. Standard of Quality: The various materials and products specified in the specification by name or description are given to establish a standard of quality and of cost for bid purposes. It is not the intent to limit the acceptance to any one material or product specified, but rather to name or describe it as the absolute minimum standard that is desired and acceptable. A material or product of lesser quality would not be acceptable. Where proprietary names are used, whether or not followed by the words Approved equal®, they shall be subject to equals only as approved by the Architect and /or Engineer.

PART 2 -~ PRODUCTS (NOT USED)

PART 3- EXECUTION (NOT USED)

END OF SECTION 014100

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": The term "approved," when used to convey Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.

D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, and protecting, cleaning, and similar operations.

H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

J. The term "experienced," when used with an entity, means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.

K. "Project site" is the space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.

E. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

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

AA	Aluminum Association, Inc. (The) www.aluminum.org	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers www.taol.com/aaadm	(216) 241-7333
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AAN	American Association of Nurserymen (See ANLA)	
AASHTO	American Association of State Highway and Transportation Officials www.aashto.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 429-5155
ACI	American Concrete Institute/ACI International www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
ADC	Air Diffusion Council	(312) 201-0101
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AFPA	American Forest & Paper Association (See AF&PA)	
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AHA	American Hardboard Association www.ahardbd.org	(847) 934-8800
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955

AI	Asphalt Institute www.asphaltinstitute.org	(606) 288-4960
AIA	American Institute of Architects (The) www.aiaonline.org	(202) 626-7300
AISC	American Institute of Steel Construction, Inc. www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction	(303) 792-9559
ALA	American Laminators Association (See LMA)	
ALCA	Associated Landscape Contractors of America www.alca.org	(800) 395-2522 (703) 736-9666
ALSC	American Lumber Standard Committee	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANLA	American Nursery & Landscape Association (Formerly: AAN - American Association of Nurserymen) www.anla.org	(202) 789-2900
ANSI	American National Standards Institute www.ansi.org	(212) 642-4900
AOSA	Association of Official Seed Analysts www.zianet.com/AOSA	(402) 476-3852
APA	APA-The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(941) 454-6989
API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ASCA	Architectural Spray Coaters Association www.ascassoc.com	(856) 848-6120

ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	American Society for Testing and Materials www.astm.org	(610) 832-9585
AWCI	AWCI International (Association of the Wall and Ceiling Industries International) www.awci.org	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (See WCMA)	
AWI	Architectural Woodwork Institute www.awinet.org	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association www.awpa.com	(817) 326-6300
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 661-4261
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963

CCC	Carpet Cushion Council www.carpetcushion.org	(203) 637-1312
CCFSS	Center for Cold-Formed Steel Structures www.umr.edu/~ccfss	(573) 341-4471
CDA	Copper Development Association Inc. www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association (The) www.canelect.ca	(613) 230-9263
CFFA	Chemical Fabrics & Film Association, Inc. www.taol.com/cffa	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 412-0900
CGSB	Canadian General Standards Board www.pwgsc.gc.ca/cgsb	(819) 956-0425
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.com (under construction)	(301) 596-2584
CPA	Composite Panel Association (Formerly: National Particleboard Association) www.pbmdf.com	(301) 670-0604
CPPA	Corrugated Polyethylene Pipe Association Division of Plastics Pipe Institute www.cppa-info.org	(800) 510-2772 (419) 241-2221
CRI	Carpet and Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) Division of Canadian Standards Association www.iasapprovals.org	(216) 524-4990

CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 462-8961
CTI	Cooling Tower Institute www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA/TIA	Electronic Industries Alliance/Telecommunications Industry Association www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eifsfacts.com	(800) 294-3462 (770) 968-7945
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
FCI	Fluid Controls Institute www.fluidcontrolsinstitute.org	(216) 241-7333
FGMA	Flat Glass Marketing Association (See GANA)	
FM	Factory Mutual System (See FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America (Formerly: FGMA - Flat Glass Marketing Association) www.glasswebsite.com/gana	(785) 271-0208
GRI	Geosynthetic Research Institute www.drexel.edu/gri	(610) 522-8440
GTA	Glass Tempering Division of Glass Association of North America (See GANA)	

HI	Hydraulic Institute	(888) 786-7744 (973) 267-9700
HI	Hydronics Institute Division of Gas Appliance Manufacturers Association www.gamanet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association Division of National Association of Architectural Metal Manufacturers (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc.	(410) 838-6550
IAS	International Approval Services (See CSA International)	
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(508) 394-4424
ICRI	International Concrete Repair Institute www.icri.org	(703) 450-0116
IEC	International Electro technical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America (The) www.iesna.org	(212) 248-5000
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 938-7444
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
IRI	HSB Industrial Risk Insurers www.industrialrisk.com	(800) 520-7300 (860) 520-7300
ITS	Intertek Testing Services www.itsglobal.com	(800) 345-3851 (607) 753-6711
IWS	Insect Screening Weavers Association (Now defunct)	

KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LGSI	Light Gage Structural Institute www.loseke.com	(972) 625-4560
LMA	Laminating Materials Association (Formerly: ALA - American Laminators Association) www.lma.org	(201) 664-2700
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (847) 577-7200
LSGA	Laminated Safety Glass Association (See GANA)	
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association www.maplefloor.org	(847) 480-9138
MFMA	Metal Framing Manufacturers Association	(312) 644-6610
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(614) 228-6194
ML/SFA	Metal Lath/Steel Framing Association (See SSMA)	
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry, Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NAAMM	North American Association of Mirror Manufacturers (See GANA)	
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NAIMA	North American Insulation Manufacturers Association (The) www.naima.org	(703) 684-0084

NAMI	National Accreditation and Management Institute, Inc.	(304) 258-5100
NAPM	National Association of Photographic Manufacturers (See PIMA)	
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(414) 248-9094
NCTA	National Cable Television Association www.ncta.com	(202) 775-3669
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	International Electrical Testing Association www.electricnet.com/neta	(303) 697-8441
NFPA	National Fire Protection Association www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-6372
NGA	National Glass Association www.glass.org	(703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association www.nofma.org	(901) 526-5016

NPA	National Particleboard Association (See CPA)	
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(301) 587-1400
NSA	National Stone Association www.aggregates.org	(800) 342-1415 (202) 342-1100
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NTMA	National Terrazzo & Mosaic Association (The) www.ntma.com	(800) 323-9736 (703) 779-1022
NWWDA	National Wood Window and Door Association (See WDMA)	
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting and Decorating Contractors of America www.pdca.com	(800) 332-7322 (703) 359-0826
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (508) 230-3516
PGI	PVC Geomembrane Institute/Technology Program University of Illinois-Urbana Champaign //pgi-tp.ce.uiuc.edu	(217) 333-3929
PIMA	Photographic & Imaging Manufacturers Association (Formerly: NAPM - National Association of Photographic Manufacturers) www.pima.net	(914) 698-7603
RCSC	Research Council on Structural Connections c/o AISC www.boltcouncil.org	
RFCI	Resilient Floor Covering Institute	(Contact by mail only)
RIS	Redwood Inspection Service Division of the California Redwood Association www.calredwood.org	(888) 225-7339 (415) 382-0662

RMA	Rubber Manufacturers Association www.rma.org	(800) 220-7620 (202) 682-4800
SAE	SAE International www.sae.org	(724) 776-4841 (724) 776-4960 (publications)
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabfurn.com	(843) 689-6878
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 938-7444
SIGMA	Sealed Insulating Glass Manufacturers Association www.sigmaonline.org/sigma	(312) 644-6610
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SPI	The Society of the Plastics Industry, Inc. www.plasticsindustry.org	(202) 974-5200
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPI/SPFD	The Society of the Plastics Industry, Inc. Spray Polyurethane Foam Division (See SPI)	
SPRI	SPRI (Single Ply Roofing Institute) www.spri.org	(781) 444-0242
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSMA	Steel Stud Manufacturers Association (Formerly: ML/SFA - Metal Lath/Steel Framing Association) www.ssma.com	(312) 456-5590

SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(800) 837-8303 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWRI	Sealant, Waterproofing & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TPI	Truss Plate Institute	(608) 833-5900
TPI	Turfgrass Producers International www.turfgrasssod.org	(800) 405-8873 (847) 705-9898
UFAC	Upholstered Furniture Action Council www.ufac.org	(336) 885-5065
UL	Underwriters Laboratories Inc. www.ul.com	(800) 704-4050 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association //members.aol.com/unibell	(972) 243-3902
USG	United States Gypsum Company A Subsidiary of USG Corporation www.usg.com	(800) 874-4968 (312) 606-4000
USITT	United States Institute for Theatre Technology, Inc. www.culturenet.ca/usitt	(800) 938-7488 (315) 463-6463
USP	U.S. Pharmacopeia www.usp.org	(800) 822-8772 (301) 881-0666
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (Formerly: AWCMA - American Window Covering Manufacturers Association) www.windowcoverings.org	(212) 661-4261

WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WIC	Woodwork Institute of California www.wicnet.org	(916) 372-9943
WMMPA	Wood Molding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

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

PRIVATE tbl2

BOCA	BOCA International, Inc. www.bocai.org	(708) 799-2300
CABO	Council of American Building Officials (See ICC)	
IAPMO	International Association of Plumbing and Mechanical Officials (The) www.iapmo.org	(909) 595-8449
ICBO	International Conference of Building Officials www.icbo.org	(800) 284-4406 (562) 699-0541
ICC	International Code Council (Formerly: CABO - Council of American Building Officials) www.intlcode.org	(703) 931-4533
SBCCI	Southern Building Code Congress International, Inc. www.sbcci.org	(205) 591-1853

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

PRIVATE tbl3@dom1

CE	Army Corps of Engineers CRD Standards	(601) 634-2355
CFR	Code of Federal Regulations www.access.gpo.gov/nara/cfr	(202) 512-1800

CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-0990
DOC	Department of Commerce www.doc.gov	(202) 482-2000
DOD	Department of Defense DOD Specifications and Standards //astimage.daps.dla.mil/online	(215) 697-6257
EPA	Environmental Protection Agency www.epa.gov	(202) 260-2090
FAA	Federal Aviation Administration Department of Transportation www.faa.gov	(202) 366-4000
FCC	Federal Communications Commission www.fcc.gov	(202) 418-0190
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
FED-STD	Federal Standard (See FS)	
FS	Federal Specification (Available from DOD, GSA, and NIBS)	
FTMS	Federal Test Method Standard (See FS)	
GSA	General Services Administration www.gsa.gov	(202) 708-5082 (202) 619-8925 (Federal Specifications)
HUD	Department of Housing and Urban Development www.hud.gov	(202) 401-0388
LBL	Lawrence Berkeley Laboratory (See LBNL)	
LBNL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-5605
MILSPEC	Military Specification and Standards (See DOD)	
NCHRP	National Cooperative Highway Research Program (See TRB)	

NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-2000
OSHA	Occupational Safety & Health Administration (See CFR 29) www.osha.gov	(202) 219-5000
RUS	Rural Utilities Service (See USDA)	(202) 720-9540
TRB	Transportation Research Board www.nas.edu/trb	(202) 334-2933
USDA	Department of Agriculture www.usda.gov	(202) 720-8732
USPS	Postal Service www.usps.gov	(202) 268-2000

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 014219 – REFERENCE STANDARDS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Specification Format.

B. Specification Language and Form.

1.2 RELATED SECTIONS

A. The specifications have been arranged in accordance with CSI / CSC “masterformat” master list of titles and numbering system.

1.3 FORMAT

A. The imperative language of the technical sections of the specifications is directed to the Contractor unless specifically noted otherwise.

B. Portions of the specifications have been derived from an automated master specification production system and may include minor deviations from traditional writing forms. Such deviations must be recognized as a normal result of this production technique and no other meaning will be implied or permitted.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 014219

SECTION 015000 -TEMPORARY CONSTRUCTION UTILITIES, FACILITIES, AND CONTROLS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-0 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies requirements for temporary construction, utilities, facilities, and controls required to support the successful construction of the project and maintain services until the permanent utilities, facilities, and controls are complete. They shall be installed, maintained, and removed subject to the Construction Manager's approval.

TABLE OF PARTS

3.26 Lunch Wagon
3.27 Erosion Control
3.28 Excavation
3.29 Blasting
3.30 Material Inventories
3.31 Deliveries
3.32 Operation, Termination, and Removal
3.33 Snow Removal

1.3 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:

Municipal and Labor & Industry Building Code requirements
Health and safety regulations
Utility company regulations
Police, Fire Department and Rescue Squad rules
Environmental protection regulations

B. Inspections: Arrange for authorities, having jurisdiction, to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site. They shall be removed, relocated as required by the progress of the work, or directed by the Construction Manager.

1.5 EXISTING UTILITIES AND SYSTEMS

A. Precaution must be taken to protect existing sanitary sewer, electrical, water and gas lines that cross the site. All existing building utility systems such as electrical, water, gas will be demolished and reconstructed during this project.

B. Trade Contractors interrupting services due to their construction operations shall provide temporary utility lines, as required, to maintain services.

PART 2 PRODUCTS

2.1 MATERIALS

A. General: Provide new materials; if acceptable to the Construction Manager, undamaged, previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."

C. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

D. Water: Provide potable water approved by local health authorities.

E. Open-Mesh Fencing: Provide 11-gauge, galvanized two (2) inch, chain link fabric fencing, six (6) feet high with galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts. Drive posts 30" into the ground at no less than 15' spacing.

2.2 EQUIPMENT

A. General: Provide new equipment; if acceptable to the Construction Manager, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light, for connection of power tools, equipment, and GFI breakers.

D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress.

E. Electrical Welding Outlets: These will not be provided. Each Trade Contractor will be responsible for his own welding power.

F. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

G. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

H. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

I. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber, reinforced polyester shell or similar nonabsorbent material.

J. First Aid Supplies: Comply with governing regulations.

K. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

Comply with NFPA 10 classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 EXECUTIONS

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.

1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

3. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.

3.3 USE CHARGES

A. Cost for temporary facilities are to be paid by the Trade Contractor requiring or providing

the temporary facility unless noted otherwise.

B. Owner will pay utility consumption costs during construction.

3.4 WATER SERVICE

A. The Plumbing Contractor shall install water service and distribution piping of sizes and pressures adequate for construction. As a minimum, provide a manifold pipe with two 3/4" hose bibs at the building water riser point of entrance until portions of the permanent piping system can be used to support construction activities. Water service may be run from a temporary or permanent source. Coordinate needs with Construction Manager.
1. Sterilization: Sterilize temporary water piping prior to use.
2. Protect system from freezing.
3. Utilize City water pressure.

3.5 ELECTRICAL POWER

A. After start of work at project site, when requested by the Construction Manager, the Electrical Contractor shall provide a temporary electrical power distribution system sufficient to accommodate temporary lighting and construction operations, including the use of power tools, and start-up of specified building equipment which must be tested, started or placed into use prior to completion of its permanent power connections. Provide weatherproof, grounded wiring with overload protection; with direct wired connections, where feasible, and for voltages up to 220/208 volts. Locate multiple outlets for 120 volt power, not less than 4 gang, at each story of construction, spaced so that the entire area of construction can be reached by power tools on a single extension cord of 100' maximum length. Maximum 20 Amp circuit breaker, four (4) receptacles per circuit breaker.

B. The Electrical Trade Contractor shall provide and pay for all maintenance, servicing, operation, and supervision of lines installed.

C. Provide service with ground fault circuit interrupter feature, as per NEC and OSHA requirements. The Electrical Trade Contractor shall have a cord inspection program in place. He shall maintain the inspection records on site.

D. As permanent power distribution system is accepted as substantially complete, either entire system or usable portions thereof, the Electrical Trade Contractor shall make suitable provisions for temporary use thereof, and remove unused portions of temporary system.

E. If required, provide meters for electrical power.

F. When temporary electrical lines are no longer required, they shall be removed by the Electrical Trade Contractor and any part, or parts, of the grounds or buildings disturbed or damaged shall be brought back to their original condition.

G. Electricity from existing lines may be used at no charge to the Trade Contractor, except for heating units, temporary offices, or storage. Each trade shall provide extension cords from the existing facilities, as required, for the execution of the Work. Electrical power for welding equipment will not be available.

H. The Electrical Trade Contractor shall maintain and operate permanent electrical supply and distribution system until time of final acceptance and transfer of operation to Owner's

personnel.

I. The Electrical Trade Contractor shall install switching controls for all lighting which will enable turning off temporary lighting during off-construction hours. The Electrical Trade Contractor shall provide manpower to control light switching and be responsible for it.

J. Temporary power supplies to the Construction Manager's Office Conference/Office Complex shall be installed with service connection by the Electrical Trade Contractor.

K. The Electrical Trade Contractor will provide power for oil or gas fired temporary heaters, if required by the Construction Manager. It will be connected so that it can remain "live" when the lighting has been turned off.

L. The Electrical Trade Contractor will provide 24-hour temporary power to any heat tape (installed by others) on temporary water and/or fire line. All temporary heat work will comply with existing OSHA requirements.

M. Construction circuits shall be separate and independent from temporary lighting.

N. The Electrical Trade Contractor will extend a temporary electrical service and provide a termination box in the Trade Contractor's office trailer area for hook-up of the Trade Contractor's trailers. Cost for individual Trade Contractor trailer hook-up will be born by the Trade Contractor requiring this service. Use of electric heaters in those trailers and shanties will not be permitted.

3.6 LIGHTING

A. Whenever overhead floor or roof deck has been installed, the Electrical Trade Contractor shall provide temporary lighting with local switching.
The Electrical Trade Contractor shall provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight and general lighting as stated below:

1. Provide uniformly spaced general lighting utilizing one (1) 150 watt incandescent lamp equivalent to 1.0 watts/sq. ft. of floor areas, and one (1) 100 watt lamp per 50' of corridor or per flight of stairs. General lighting to have a minimum of 5' candles measured at floor level.

2. Limit lighting installations to intensities which will accommodate normal access and workmanship requirements, recognizing that each entity performing work requiring higher intensity lighting will provide supplementary plug in temporary lighting and localized areas where such work is in progress.

3. As permanent lighting system is substantially complete for each story or usable portion thereof, the Electrical Trade Contractor shall make suitable provisions for temporary use thereof and remove unused portions of temporary lighting system.

4. The Electrical Trade Contractor shall maintain and operate permanent lighting system until time of final acceptance and transfer of operation to Owner's personnel, including turning off lighting during off-construction hours.

5. The Electrical Trade Contractor shall replace bulbs that are burned out or

substantially dimmed by substantial hours of use.

6. Special lighting required for construction activities shall be provided by contractor requiring it.

7. The Electrical Trade Contractor shall provide safety lighting in the stairways, hallways, and exterior security lighting on a 24-hour basis.

8. Furnish and install dusk to dawn type security lights on poles as shown on the site construction staging plan.

9. If more lighting is necessary to install finishes, drywall, painting, etc., the contractor needing the extra lighting will provide.

3.7 TELEPHONES

A. The Construction Manager shall be responsible to provide telephone service to a demarcation point in the Trade Contractor office trailer area. Temporary phone service must support 10 office trailers that require phone and/or fax service. Cost for individual hook ups, telephones, and use fees, shall be the responsibility of each Trade Contractor.

B. The Construction Manager shall make arrangements for one (1) public telephone to be installed on the site and include monthly service cost for the duration of the project.

3.8 SANITARY FACILITIES

A. The Construction Manager shall provide temporary toilets. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

Provide toilet tissue for each facility.

B. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted. Provide means of locking facilities when construction is not in progress.

Provide one unit for use of Construction Managers office/conference meeting complex.

C. Drinking Water Facilities: Each trade contractor shall provide drinking water for it=s own personnel.

3.9 STORM SEWERS

A. If storm sewers are available, the Sitework Trade Contractor shall provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available, or cannot be used, the Sitework Trade Contractor shall provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.

B. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.

C. Comply with the soil erosion and sedimentation control plan and local authorities having jurisdiction.

3.10 DEWATERING FACILITIES

A. For temporary drainage and dewatering facilities, and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division-2 Sections. Where feasible, utilize the same facilities. The Sitework Trade Contractor shall be responsible to maintain the site, excavations and construction free of water.

B. In the event that storm drain piping is not completed when needed for roof drain tie in, then the Plumbing Trade Contractor shall provide temporary storm water drainage from the building, and the Sitework Trade Contractor shall control roof drainage from building onto the site.

C. Sitework Trade Contractor shall be responsible to drain or pump water and remove debris from the site so as not to delay his continuous work or progress. This shall include operating pumps during second shift in order to facilitate next-day continuation of work.

D. Sitework Trade Contractor shall excavate in a manner that prevents all surface water from flowing into the building area. Sitework Trade Contractor shall be responsible to remove any runoff water or debris which enters the building area.

E. Sitework Trade Contractor shall continue to drain site and remove debris until designed grades are obtained.

F. Once building excavation grades are complete, the Concrete Work Contractor shall be responsible to remove all water and debris to install and backfill the building foundations.

G. Upon completion of building foundations, each Trade Contractor shall be responsible to remove water and debris required to complete his work.

3.11 HEATING AND VENTILATION

A. Temporary heating shall be provided and maintained by the Trade Contractor performing the work if the outside temperature falls below 40E F at anytime during the day or night for all exterior work or work performed prior to the building being enclosed by walls and roof.

B. The Trade Contractor shall furnish temporary heat by acceptable means to provide sufficient heat to maintain a temperature of 55E F, 24 hours a day throughout the entire area of the work for which the Trade Contractor is responsible prior to the building being enclosed by walls and roof.

C. Except where use of the permanent system is authorized, provide vented, self-contained LP gas or fuel oil heaters with individual space thermostatic control. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited. Temporary heating may not be provided using electrical heating equipment if using electrical power supplied by the Owner.

D. As soon as the building, or portions thereof, is generally enclosed with walls and roof and

temporary heat is required for scheduled work, or required to facilitate proper workmanship, and permanent heating system is not yet operable or authorized for use, the HVAC Contractor shall arrange and provide temporary heat service for every entity authorized to do work at the project site. The HVAC Contractor shall maintain temperatures as indicated
by other Specification Sections for each type of work to be performed. The Construction Manager shall be the sole arbiter of when the building is considered generally enclosed.

E. Refer to paragraph 3.14 in section 015000 for responsibilities to install, maintain, and remove temporary enclosure of windows and doors until the permanent materials are in place.

F. After the conditions of construction require continuous 24 hour heat in the building, the HVAC Contractor shall provide, operate, and maintain temporary radiation or unit heaters to provide required temperatures (minimum 55E F) for the conduct of work. This service shall be continued until the permanent heating system has been completely installed and is in operation. The HVAC Contractor shall furnish and pay for all fuel as required for providing temporary heat after the building is generally enclosed.

G. As permanent heating/cooling system is substantially complete and operational for each story or usable portion thereof, the HVAC Trade Contractor shall make suitable provisions for use thereof in temporary heating and cooling. The HVAC Trade Contractor shall maintain and operate permanent system for temporary heating/cooling purposes, including service to occupied areas, if any, until time of final acceptance or transfer of operation to Owner's personnel, for major parts of system if not for entire heating system and air conditioning. The Owner shall pay for all fuel costs incurred by the permanent HVAC systems after acceptance of systems.

H. Warranty: The warranty as required by the contract specifications will not begin until final acceptance of the system has been given by the architect for all or part of a system. The warranty period does not start with the use of the equipment for temporary heating and cooling.

I. All permanent heating and air conditioning equipment used to supply temporary heat and air conditioning shall be completely cleaned and reconditioned by the HVAC Trade Contractor prior to final acceptance. Radiator traps and valves used in the heating system during the period of its operation to supply temporary heat shall not be reinstalled in the permanent system. Install new disposable filters and clean non-disposable filters prior to final acceptance. Replace significantly worn parts and parts that have been subject to unusual operating conditions.

J. APARAGRAPH OMITTED@

K. Temporary Ventilation: A Trade Contractor requiring ventilation for work shall provide fans or other necessary equipment to condition air, provided prior approval has been obtained from the Construction Manager.

L. Humidification: Where control of ambient humidity is required for proper performance of the work, or for curing/drying of installed work or for protection of installed work from deterioration due to variations in ambient conditions, each Trade Contractor shall provide his own temporary humidification or dehumidification equipment to maintain the required conditions. Coordinate the use of the equipment with temporary heating to produce the required conditions with a minimum overall use of energy.

M. Permanent electrical power needed to operate permanent heating system must be provided by the Electrical Trade Contractor in conjunction with building enclosure, or the Electrical Trade Contractor shall furnish adequate temporary power to operate permanent heating system.

N. In the event of permanent installed equipment failure, repairs or alternate equipment must be in place within 24 hours of failure or the Construction Manager will take action necessary to restore the heat to the design temperature and will deduct any and all charges from the HVAC Contractor.

O. If additional heating above 55 degrees F or cooling below 80 degrees F is required by a Contractor to properly install and maintain his work, he shall be responsible to provide the additional heating and cooling.

P. Connections for temporary electric to the temporary heat will be provided by the Electrical Contractor.

3.12 FIELD OFFICES

A. Trade Contractors shall provide offices for their own personnel. All type and location of jobsite offices and equipment will be approved by the Construction Manager.

B. Storage and Fabrication Sheds: Each Trade Contractor shall provide storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces. All steps and platforms connected to shelters must be per OSHA regulations.

C. All offices and sheds must have the Trade Contractor's identification on them.

3.13 ROADS AND PARKING

A. Sitework Trade Contractor shall construct and maintain temporary roads, construction parking and paving to adequately support the indicated loading and to withstand exposure to traffic during the construction period, in conjunction with the site logistics plan bound into this specification. Locate temporary paving for roads, storage areas and parking where the same permanent facilities will be located.

B. Sitework Trade Contractor shall be responsible for providing stable parking area for all construction personnel on the jobsite by use of crushed stone/binder paving, including permanent parking areas.

C. The Sitework Trade Contractor shall maintain truck tire wash facility at the construction entrance.

D. Snow removal will be performed by the Sitework Contractor.

3.14 ENCLOSURES

A. All temporary enclosures required for protection of exterior construction in progress and

completed from exposure, bad weather, other construction operations, and similar activities and to maintain the progress schedule, shall be provided by each contractor as necessary to protect their work.

B. General Trades Contractor shall provide temporary building enclosure for protection of construction in progress, and completed, from exposure, foul weather, other construction operations, and similar activities. The extent of temporary enclosures will be as necessary to maintain the progress schedule.

C. Where heat is needed and the permanent building enclosure is not complete, the General Trades Contractor shall provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

The Aluminum, Storefront, Windows, Glass and Glazing Trade Contractor shall be responsible to remove the temporary entrance enclosures and install the permanent entrances or reinstall parts of the temporary enclosures in such a manner that the building security is maintained at the end of each workday shift.

The Aluminum, Storefront, Windows, Glass and Glazing Trade Contractor shall be responsible to provide temporary window enclosures, in the event that aluminum window rough openings are fully prepared to receive finish window installation and the finish materials are not ready for prompt installation to maintain the construction schedule.

The General Trade Contractor shall furnish and install temporary entrance doors and maintain them until such time the permanent entrances are installed.

D. Install tarpaulins securely with noncombustible wood framing and other materials. Close openings of 25 sq. ft. or less with plywood or similar materials.

E. Dust partitions and enclosures if indicated on the drawings shall be constructed, maintained, and removed by the General Trades Contractor.

F. Each Trade Contractor is required to construct, maintain, and remove dust partitions required to prevent dust from entering occupied areas due to the performance of his work.

3.15 LIFTS AND HOISTS

A. Lifting and hoisting of all materials and equipment will be the responsibility of each Trade Contractor.

B. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and shall be provided by contractor requiring same.

C. Each Trade Contractor shall be responsible to provide all site and subsurface modification preparation and replacement required to use his lifting and hoisting equipment.

3.16 ELEVATORS

A. Not in project.

3.17 PROJECT IDENTIFICATION

A. The Construction Manager shall prepare project identification and other signs, as approved by the Owner, of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. See attached sketches at end of this section.

B. The Construction Manager shall provide one (1) sign erected on the site, where directed, to identify the project. Sign shall include Project name, Owner's name, Architect's name, and Construction Manager's name. Size shall be 4' x 8'; color and lettering style shall be as designed by the Architect.
See attached sketches at end of this section.

C. Engage an experienced sign painter to apply graphics.

D. Temporary Signs: The Construction Manager shall prepare signs to provide directional information to construction personnel and visitors as required by the Construction Manager. See attached sketches at end of this section.

E. No other signs allowed on site unless approved by the Construction Manager.

3.18 WASTE DISPOSAL AND CLEANUP

A. The construction manager shall provide trash collection containers for construction debris, exclusive of roofing tear off debris, rock, earth, site work demolition waste, masonry and concrete debris and pay for all debris disposal cost for them. Each trade contractor on the project will be required to clean up and deposit in the dumpster, all debris generated by his trade contract work on a daily basis. Roofing contractor, Site work contractor, Masonry contractor and Concrete contractor must pay their own solid waste removal costs. All other contractors will be provided with collection containers for their use at no cost to the contractor.

This requirement shall be enforced by the Construction Manager and will result in cost assessment against a Trade Contractor who fails to perform daily clean-up within 48 hours of verbal or written notice from the Construction Manager. Each Trade Contractor will be responsible for flattening or crushing all trash as necessary when placed into the dumpster. Hazardous material shall not be placed in the collection container.

B. Contractors may be required to place salvageable and recyclable materials and debris in separate designated dumpsters or dispose of properly for their own salvage value.

C. All Contractors are to participate in a monthly eight (8) hour general clean up which will be coordinated by the Construction Manager. Each Contractor shall provide a minimum of on (1) clean-up person for every 15 or less people on the Contractor's average work force for the month with the appropriate brooms, shovels, and wheel barrows. Clean up will be supervised by the Construction Manager.

D. The Trades Contractors shall be responsible for weekly broom cleaning of all floor surfaces, for dust, dirt and general trash.

E. The Construction Manger will be responsible for providing trash receptacles, "55 gallon

capacity". Emptying them with weekly cleanup or when filled to capacity, shall be done by the Contractors performing the work in that area.

F. The General Trades Contractor shall determine with the Construction Manager, a location for an enclosed trash chute to control dust for debris from second floor levels to the dumpster container. General Trades Contractor shall also erect a dimensional lumber guard railing around the trash chute to prevent jobsite personnel from exposure to falling debris.

3.19 CONSTRUCTION AIDS AND PROTECTION

A. The General Trades Contractor shall provide wood handrails and barricades on all stairs and landings, according to OSHA regulations. Provide barricades at all elevator shafts.

B. The Steel Work Trades Contractor shall furnish, install and remove at completion, all perimeter guard rails for elevated concrete slabs.

C. The General Trades Contractor shall install safety coverings, handrail around all recessed areas and openings on all floors. Building perimeters, roof, wall, or shaft openings shall have perimeter protection as required by OSHA. This work shall comply with all OSHA requirements and remain in place until permanent construction fills those openings.

D. The Roofing Trades Contractor shall install roof edge perimeter protections and guard rails or coverings, at all roof openings.

E. Each Trade Contractor, upon working in any of the areas named in the above paragraph, shall remove the safety covering and handrail to perform his work. Upon completion of his work for the day, lunch, or breaks, or any time when the individual Trade Contractor is not working in that opening, the safety covering and handrail must be replaced by the Trade Contractor removing it. At the end of each day, the General Trades Contractor will inspect the site and install all safety coverings and handrails. He shall report to the Construction Manager if coverings and handrails are not being reinstalled by other contractors.

At the end of the project, or in order to install permanent construction, the General Trades Contractor shall remove all coverings and handrails.

F. The Trade Contractors requiring access to above grade work are responsible for providing ladders, scaffolding and appropriate methods to access their work. Trade Contractor desiring use of in place above grade work platforms must arrange directly with the party that owns the equipment and make all rental and insurance arrangements directly with that party.

G. All work platforms, scaffolding, etc., on the project shall be available for access by the Owner, Architect, Municipal Authority, Testing Agency and/or Construction Manager.

3.20 FIRE SAFETY

A. Existing fire protection shall be maintained in place until permanent sprinklered fire protection system is available for use. The Sprinkler System Trades Contractor shall provide the permanent sprinkler fire protection system for use at the earliest possible date after building enclosure and 55° F temperatures are maintained to protect the building structure.

B. The Construction Manager shall provide fire extinguishers, as required by OSHA standards or other codes.

C. Each Contractor shall store combustible materials in containers in fire-safe locations.

D. Each Contractor shall maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

E. Each Contractor shall provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

F. The Construction Manager shall provide the local fire company with a set of site and floor plans. He shall invite the local fire company to visit the project site and plan emergency response.

3.21 BARRICADES, WARNING SIGNS, AND LIGHTS

A. All trade contractors requiring barricades, warning signs and lights shall comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against.

3.22 SITE ENCLOSURE FENCE

A. The Construction Manager shall perform all temporary fencing work as indicated on the site logistics drawing. This work shall be done immediately upon mobilizing for Work at the beginning of the Project.

B. The Sitework Contractor shall maintain permanent chain link fencing and fabric fencing throughout the duration of the Project, particularly maintaining security function of gate devices.

3.23 BUILDING SECURITY, ENCLOSURE, AND LOCKUP

A. The General Trades Contractor shall install substantial temporary enclosure of partially completed areas of construction. Provide and maintain locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.

B. Each Trade Contractor is responsible for the secure storage of their own material and equipment on and off the site.

3.24 ENVIRONMENTAL PROTECTION, NPDES, AND PPC

A. To the fullest extent permitted by law, the Trade Contractor shall indemnify and hold harmless the Owner and Construction Manager, their employees and agents, from claims, losses, damage, and expenses including, but not limited to, attorney's fees arising out of performance of the work as it relates to any type of pollution related situations. This would apply to bodily injury, sickness, disease or death, or to damages or destruction or contamination of tangible property arising out of the acts or omission of the Trade Contractor or the joint negligent acts of the Owner or Construction Manager, or anyone for whose acts the Trade Contractor may be liable.

B. Each Trade Contractor, prior to construction, must comply with the National Pollution Discharge Elimination System (NPDES) and submit and State and Local Preparedness, Prevention and Contingency Plans (PPC) to the Construction Manager before the start of work.

Each Trade Contractor must construct, operate and maintain storage of materials to provide protection for each individual worker, as well as the protection of property or real estate of the construction site and environment.

C. Each Trade Contractor shall provide protection, operate temporary facilities, and conduct construction in ways and methods that comply with all environmental regulations, and minimize the possibility that air, water, and soil from becoming contaminated or polluted as a result of work or storage of supplies and materials, or equipment usage.

D. Each Trade Contractor will designate and train a responsible employee in environmental contamination procedures, including, but not limited to, emergency responses, material and waste inventories, spills and leak precautions and responses, inspections, housekeeping, security, and external factors.

E. Open burning will not be permitted.

3.25 WORKDAY

A. The workdays for the project are defined as 7:00 a.m. to 3:30 p.m., Monday through Friday, with lunch period from 12:00B12:30 p.m. The progress schedule may require contractors to perform work other than the normal workday and in addition to the normal workday to meet milestones in the progress schedule for the project, or to make up time previously lost to regain the progress schedule requirements or to prevent interruption of the Owner's ongoing operations at no additional cost to the Owner.

B. Working times other than the normal workday or in addition to the normal work day, must be arranged in advance with the Construction Manager.

C. Trade Contractors who require additional workday hours to regain work time previously lost to meet the requirements of the project schedule shall be assessed for all costs including Construction Manager Supervision and other Trade Contractor cost necessary for the performance of their work.

3.26 LUNCH WAGON

A. Lunch wagons, catered events or other non-construction related functions shall not be permitted on the project site, except by the written permission of the Owner and Construction Manager.

B. No alcoholic beverages or controlled substances shall be allowed on the project at any time.

3.27 EROSION CONTROL

A. The Sitework Trade Contractor shall employ all methods required to comply with local regulatory authorities requirements to control erosion from the project site, including drainage control ditches, sediment basins, straw bale dikes, silt fencing and whatever

procedure necessary to comply with requirements.

B. The Sitework Trade Contractor shall maintain these controls throughout the duration of the project.

3.28 EXCAVATION

A. Any Trade Contractor performing excavation shall protect all excavated materials from moisture, freezing and drying, so that the same materials excavated can be utilized for backfill.

B. Any Trade Contractor performing excavation shall have an OSHA trained person on site during all excavation operations. This person shall evaluate soil types and conditions to determine the required shoring and excavation methods.

3.29 BLASTING

A. Blasting is not permitted.

3.30 MATERIAL INVENTORIES

A. Contractors shall coordinate the delivery and storage on the jobsite of all significant materials.

B. Each Trade Contractor shall be responsible for the proper location, secure, and weather resistant storage as required of all materials. This includes placement of materials not to obstruct passage on site or within building structures or in any way which causes impediment or obstruction to other Trade Contractors.

C. All material inventories must be stored by the Trade Contractor to avoid excessive loads on building structure.

D. When directed by the Construction Manager, a Trade Contractor shall remove or relocate material inventories as required for the progress of the project.

3.31 DELIVERIES

A. All contractors are required to properly instruct material suppliers and vendors to address deliveries to them specifically by named responsible party at the jobsite and require advance notice.

B. All deliveries addressed to the project in general, the Owner, Architect or Construction Manager, will be refused and returned to shipper.

C. The Owner will not be responsible for receipt, handling, or loss of any materials which are shipped to the Owner in error and received unknowing of relationship to the project.

D. Contractor receiving materials at the jobsite shall be responsible for prevention of any mud or other deposits on public roadways or other areas outside project limit lines, which may result due to methods of material delivery. Trade Contractor shall instruct delivery conveyor to take appropriate measures to prevent depositing mud or other construction deposits outside of contract limit lines. Total responsibility of cleanup of mud or other

construction deposit outside of contract limit lines will be the responsibility of the Trade Contractor receiving the delivery.

E. Each Contractor shall provide his superintendent with a telephone pager to enable locating the superintendent on and off site.

3.32 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Construction Manager requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or not later than Substantial Completion. Complete or, if necessary restore, permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of the Trade Contractor. The Owner reserves the right to take possession of Project identification signs.

2. The Sitework Trade Contractor shall remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt, and other petrochemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.

3.33 SNOW REMOVAL

A. Snow removal for roads, building exterior, contractor parking, contractor office, staging, and Construction Manager's office area access will be performed by the Sitework Contractor.

B. The General Trades Contractor shall be responsible for snow removal from within the building, maintaining safe walkway, stair traffic areas and building corridors, using anti-skid methods for snow, mud and/or ice removal, to provide safe usage.

C. All snow and ice removal required to perform contractor specific tasks on floors, roof,

work stages, etc., shall be performed by each Contractor.

END OF SECTION 015000

SECTION 016000 - MATERIALS AND EQUIPMENT PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime contractor.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Reference Standards and Definitions" specifies the applicability of industry standards to products specified.
2. Division 1 Section "Submittals" specifies requirements for submittal of the Contractor's Construction Schedule and the Submittal Schedule.
3. Division 1 Section "Substitutions" specifies administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, which is current as of the date of the Contract Documents.

b. "Foreign Products," as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.4 SUBMITTALS

A. Product List: A list of products required is included at the end of this Section. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

B. Product List: Prepare a list showing products specified in tabular form acceptable to the Architect. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.
2. Form: Prepare product list with information on each item tabulated under the following column headings:

a. Related Specification Section number.
b. Generic name used in Contract Documents.
c. Proprietary name, model number, and similar designations.
d. Manufacturer's name and address.
e. Supplier's name and address.
f. Installer's name and address.
g. Projected delivery date or time span of delivery period.

3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.

a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.

4. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of the completed product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.

5. Architect's Action: The Architect will respond in writing to Contractor within 2 weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.5 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contractors.
2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:

1. No available domestic product complies with the Contract Documents.
2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.

D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
   a. Name of product and manufacturer.
   b. Model and serial number.
   c. Capacity.
   d. Speed.
   e. Ratings.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.
2. Semi proprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.

a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

3. Nonproprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
4. Descriptive Specification Requirements: Where Specifications describe a product or assembly,

listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.
   a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.

6. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.

7. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
   a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category.

8. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern, and texture from the product line selected.

9. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection and for procedures required for processing such selections.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

   1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 016000

SECTION 017000 – CONTRACT CLOSEOUT

1.1 RELATED SECTIONS

A. General and Supplementary Conditions.
B. Section 013300 - Submittals: Procedures for closeout documents submittals.
C. Section 015000 - Construction Facilities and Temporary Controls: Progress cleaning.
D. Section 017500 - Starting of Systems: System start-up, testing, adjusting, and balancing.

1.2 CLOSEOUT PROCEDURES

A. Completion of the Work specified herein is a condition precedent to issuance of the Final Certificate of Payment by Construction Manager and Architect.

B. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect review.

C. Provide submittals to Architect through Construction Manager that is required by governing or other authorities.

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

E. Owner will occupy portions of the site as specified in Section 01011.

1.3 HAZARDOUS-FREE MATERIALS CERTIFICATION

A. Upon completion of this project, the Contractor shall deliver to the Architect three (3) copies of a notarized letter addressed to the Owner certifying that to the best of the Contractor's knowledge all products provided by them for incorporation into this project do not contain any hazardous materials exceeding current EPA guidelines.

B. It is the responsibility of the Contractor to review "Manufacturer's Safety Data Sheets" (MSDS) on all products to ascertain compliance with EPA guidelines prior to shop drawing submission to the Architect. Incorporation of products into the project without the submission of shop drawings or samples to the Architect will indicate that the Contractor has ascertained that the products meet EPA limits.

C. It is the responsibility of the Contractor to notify the Architect in writing of the lack of compliance of a product with EPA guidelines prior to ordering or incorporating any products into this project.

1.4 OPERATION AND MAINTENANCE DATA

A. Submit data on 8-1/2 x 11 inch text pages, bound in three D side ring binders with durable plastic covers.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of Project.

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers. Include for all mechanical and electrical equipment a compilation of the nameplate data for equipment; name, address and phone number of nearest distributor; name, address and phone number of nearest service organization.

2. Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

    a. Significant design criteria.
    b. List of equipment.
    c. Parts list for each component.
    d. Operating instructions.
    e. Maintenance instructions for equipment and systems.
    f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents. Include videotapes of training sessions.
    g. (1) 8x10 photograph of each piece of equipment.
    h. Name and telephone number of service representative.
    i. Test results/reports.
    j. Certified performance curves.
    k. Re-order information.
    l. Catalog, model, serial number.
    m. Wiring diagrams.
    n. Assembly drawings.
    o. Schedule
    p. Charts
    q. Nameplate data.

3. Part 3: Project documents and certificates, including the following:

    a. Shop drawings and product data.
    b. Air and water balance reports.
    c. Certificates.
    d. Photocopies of warranties and bonds.

E. Submit 1 draft copy of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content of all document sets as required prior to final submission.

F. Submit three copies of revised final volumes, within 10 days after final inspection.

1.5 WARRANTIES

A. Provide triplicate notarized copies.

B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.

C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.

D. Submit prior to final Application for Payment.

E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.6 FINAL SUBMISSIONS

A. Submit Consent of Surety to Final Payment.

B. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

C. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by the Architect.

D. Affidavit of payment of all claims against the work.

1.7 PROJECT RECORD DOCUMENTS

A. Trade contractors shall maintain on site, one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Construction Manager and Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish floor.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract Drawings.

G. Remove Architect seal from all documents.

H. Submit documents to Architect with final Application for Payment.

I. Submit a final liquidated damages settlement statement.

1.8 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed extra materials and parts as indicated within the respective specification sections; obtain receipt from Owner upon delivery and placement and prior to final payment.

END OF SECTION 017000

SECTION 017500 - FACILITY STARTUP/COMMISSIONING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Starting systems.

B. Demonstration and instructions.

1.2 RELATED SECTIONS

A. General and Supplementary Conditions.

B. Section 017000 - Contract Closeout: System operation and maintenance data and extra materials.

1.3 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Construction Manager, Architect/Engineer and Owner seven (7) days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or for other conditions which may cause damage.

D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable manufacturer=s representative and Contractors= personnel in accordance with manufacturers= instructions.

G. When specified in individual Specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

1.4 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner=s personnel no more than two (2) weeks prior to date of Substantial Completion.

B. Demonstrate Project equipment and instruct in a classroom environment located at site and instructed by a qualified manufacturers= representative who is knowledgeable about the Project.

C. Contractor shall video tape the demonstration/instructions on format acceptable to Owner and provide two (2) copies of tape at Project closeout or at such time as directed by Construction Manager. Tape shall be clear in visual and audio recreation of demonstration and instructions. A professionally prepared training video produced by the manufacturer shall be an acceptable substitute to on-site video tape.

D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners= personnel in detail to explain all aspects of operation and maintenance.

F. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment or designated location.

G. Prepare and insert additional data in operations and maintenance manuals when needed for additional data becomes apparent during construction.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 017500

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
3. Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
7. Complete startup testing of systems.
8. Submit test/adjust/balance records.
9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
10. Advise Owner of changeover in heat and other utilities.

11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
12. Complete final cleaning requirements, including touchup painting.
13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or on additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

C. Contractor to provide all close out documents and procedures as noted in this section 017700 within 90 days from time of substantial completion. A penalty of $100.00 per day will be assessed after the 90 day period until all close out documents and procedures have been submitted and approved by the architect.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Page number.

4. Include space for sign off and acceptance of each item.

1.6 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect and Owner's reference during normal working hours.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

    a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
    b. Accurately record information in an understandable drawing technique.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
    d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Mark important additional information that was either shown schematically or omitted from original Drawings.
4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders, Record Drawings, and Product Data, where applicable.

D. Record Product Data: Submit one copy of each Product Data submittal. Mark one (1) set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Drawings, and Record Specifications, where applicable.

E. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.7 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data:

a. Emergency instructions and procedures.
b. System, subsystem, and equipment descriptions, including operating standards.
c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
d. Description of controls and sequence of operations.
e. Piping diagrams.

2. Maintenance Data:

a. Manufacturer's information, including list of spare parts.
b. Name, address, and telephone number of Installer or supplier.
c. Maintenance procedures.
d. Maintenance and service schedules for preventive and routine maintenance.
e. Maintenance record forms.
f. Sources of spare parts and maintenance materials.
g. Copies of maintenance service agreements.
h. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.8 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Provide instructors experienced in operation and maintenance procedures.

2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with Owner, through Architect, with at least seven days' advance notice.
4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:

1. System design and operational philosophy.
2. Review of documentation.
3. Operations.
4. Adjustments.
5. Troubleshooting.
6. Maintenance.
7. Repair.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances. Cut lawn and field areas.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.

i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

    1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.
o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean ducts, blowers, and coils if units were operated without filters during construction.
r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
s. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017836 - WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer’s standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies procedures for submitting warranties.
2. Division 1 Section "Contract Closeout" specifies contract closeout procedures.
3. Divisions 2 through 34 Sections for specific requirements for warranties on products and installations specified to be warranted.
4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. Separate Prime Contracts: Each prime contractor is responsible for warranties related to its own contract.

1.3 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by

replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.

C. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Submit a draft to the Owner, through the Architect, for approval prior to final execution.

1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

D. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project

Manual.

E. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.

2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.

3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 LIST OF WARRANTIES

A. Schedule: Provide warranties on products and installations as specified in individual specification sections.

END OF SECTION 017836

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Instruction in operation and maintenance of systems, subsystems, and equipment.
2. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For instructor.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect.
d. Name of Construction Manager.
e. Name of Contractor.
f. Date of video recording.

2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
4. At completion of training, submit complete training manual(s) for Owner's use prepared in same paper and PDF file format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.5 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.7 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.

2. Documentation: Review the following items in detail:

   a. Emergency manuals.
   b. Systems and equipment operation manuals.
   c. Systems and equipment maintenance manuals.
   d. Product maintenance manuals.
   e. Project Record Documents.
   f. Identification systems.
   g. Warranties and bonds.
   h. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.

5. Adjustments: Include the following:

   a. Alignments.
   b. Checking adjustments.

c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning.
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

1.8 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

1.9 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish an instructor to describe Owner's operational philosophy.
3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Construction Manager, with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.10 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD modewith vibration reduction technology.

1. Submit video recordings on Owner preferred technology.
2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged according to Project Manual table of contents:

    a. Name of Contractor/Installer.
    b. Business address.
    c. Business phone number.
    d. Point of contact.
    e. Email address.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.

1. Film training session(s) in segments not to exceed 15 minutes.

    a. Produce segments to present a single significant piece of equipment per segment.
    b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
    c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.

D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

1. Furnish additional portable lighting as required.

E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.

G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017900

SECTION 033000 - CAST-IN-PLACE CONCRETE

SUMMARY

This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

STEEL REINFORCEMENT

Reinforcing Bars: ASTM A 615/A 615M, Grade as shown on structural drawings, deformed.

Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

CONCRETE MATERIALS

1. Cementitious Material: Use products as shown on the structural drawings.

2. Select type of portland cement from options in subparagraph below.

    a. Normal-Weight Aggregates: ASTM C 33, graded, 3/4-inch nominal maximum coarse-aggregate size.

    b. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

    c. Water: ASTM C 94/C 94M

    d. Air-Entraining Admixture: ASTM C 260.

CONCRETE MIXING: Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

EXECUTION FORMWORK

1. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

2. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

3. Retain one of two options in paragraph below. ACI 301 requires chamfers, unless otherwise specified.

4. Chamfer exterior corners and edges of permanently exposed concrete.

EMBEDDED ITEMS

Specify embedded items and anchorage devices for other work attached to or supported by cast-in-place concrete. Add specific requirements for installing embedded items, if any, that are part of the Work.

Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

VAPOR BARRIER Plastic Vapor barriers: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions. See specification section 033001 - VAPOR BARRIER

STEEL REINFORCEMENT General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

JOINTS Coordinate joint types, description, and location with Drawings. Joint types have been consolidated in this Article for consistency rather than for strict sequence of installation.

General: Construct joints true to line with faces perpendicular to surface plane of concrete. Revise criteria for locating construction joints in paragraph below to suit Project. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect. Insert spacing of contraction joints here or on Drawings if required. Contraction-joint spacings vary with slab thickness, aggregate size, and slump based on PCA's recommendations. Depth of joint may be varied to suit cutting method or if steel-fiber reinforcement is used. Early-entry saws may cut less than one-fourth of concrete thickness; steel-fiber-reinforced slabs, one-third of concrete thickness.

Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

Select type of joint-forming method from two subparagraphs below or retain both subparagraphs as Contractor's option. Add joint spacing if not indicated on Drawings.

Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

CONCRETE PLACEMENT

Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

Cold-Weather Placement: Comply with ACI 306.1.

Hot-Weather Placement: Comply with ACI 301.

Select types of formed finishes required from this Article. Coordinate finishes selected with finish schedule or indicate location of each finish on Drawings.

FINISHING FLOORS AND SLABS

General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

Select types of slab finishes required from remaining paragraphs. Coordinate finishes selected with finish schedule or indicate location of each finish on Drawings.

Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

Revise locations of float finish in subparagraph below to suit Project.

Apply float finish to surfaces to receive trowel finish.

Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until surface is free of trowel marks and uniform in texture

and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

Revise locations of trowel finish in first subparagraph below to suit Project.

Comply with flatness and levelness tolerances for trowel finished floor surfaces.

Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

CONCRETE PROTECTING AND CURING

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.

If evaporation rate in first paragraph below is exceeded, ACI 305R states that plastic shrinkage cracking is probable. See manufacturers' literature or ACI 305R for estimated moisture-loss chart relating relative humidity, air and concrete temperature, and wind velocity to rate of evaporation.

Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

Cure concrete according to ACI 308.1, by one or a combination of the following methods:

Moisture Curing: Keep surfaces continuously moist for not less than seven days.

CONCRETE SURFACE REPAIRS Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

FIELD QUALITY CONTROL

Testing and Inspecting: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports. Testing Services: Tests shall be performed according to ACI 301.

END OF SECTION 03300

SECTION 033010 - BELOW SLAB VAPOR BARRIERS

SUMMARY
This Section includes material and product data for under-slab vapor barriers.

1. Cast in place concrete slabs.
2. Depressed slabs.

MATERIALS
1. Vapor barrier must have all of the following qualities:
   A. Permeance of less than 0.1 Perms [grains/(ft² · hr · inHg)] as tested in accordance with ASTM E 1745 Section 7.
   B. Strength: ASTM E 1745 Class C.
   C. Thickness: 15 mils minimum

2. Vapor barrier products:
   A. Basis of Design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
   B. STEGOWRAP V.B. NOT REQUIRED. PROVIDE ALTERNATE MEETING ASTM 1745 CLASS C RATING, MINIMUM 15 MIL THICKNESS AND 0.1 PERMEANCE.

ACCESSORIES
1. Seam tape:
   B. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
2. Vapor-proofing mastic:
   A. Stego Mastic by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

INSTALLATION
1. Install vapor barrier in accordance with manufacturer's guidelines. All seams must be taped and mastic used at all foundation wall intersections.
2. Vapor barrier to be installed directly under concrete slabs, above sand or granular fill material.

END OF SECTION 03300

SECTION 042000 - UNIT MASONRY

GENERAL

SUMMARY

C. This Section includes unit masonry assemblies consisting of the following: concrete masonry units (CMUs) and face brick.
D. See Division 05 Section "Metal Fabrications" for furnishing steel lintels and shelf angles for unit masonry.

SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for each type and color of exposed masonry units and colored mortars.

C. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards.

D. For masonry units include material test reports substantiating compliance with requirements.

E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

QUALITY ASSURANCE

F. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner. Submittal data provided by masonry unit manufacturer may be used in lieu of independent special inspection. Final determination to be made upon review of submittal data.

G. Concrete Masonry Unit Test: For each type of unit required, per ASTM C 140.

H. Mortar Test (Property Specification): For each mix required.

I. Grout Test (Compressive Strength): For each mix required.

J. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in International Building Code.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PRODUCTS

MANUFACTURERS

FACE BRICK UNIT MASONRY

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, are limited to products specified.

B. Face brick masonry unit manufacturer: US Brick 701 East Bay Street. Suite 102 Charleston, SC. 29403.

C. Face Brick Product: US Brick, Chestnut Velour (Matches Existing Building), Modular (Contractor to confirm modular size matches existing).

D. General: Provide shapes indicated and as follows:
   1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.

   2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

   3. Face Brick: ASTM C 216, Grade SW, Type FBX

   4. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 6400 psi.

   5. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
   6. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not efflo-resced."

   7. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet.

   8. Size (Actual Dimensions): See elevation drawings for size call outs.

CONCRETE MASONRY UNITS (CMUs)

I. CMU masonry unit approved manufacturers.

   10. Amcon Block and Precast

   11. WW Thompson Concrete Products.

   12. Alternate manufacturers will be allowed, provide full product submittal for architect’s review and approval.

B. Shapes: Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

C. Integral Water Repellent: Provide units made with liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength for exposed units.

D. Products:

   1. Concrete Masonry Units: ASTM C 90.

   2. Provide submittal based on masonry units listed on plans.

   3. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.

4. Weight Classification: Normal weight.

5. Pattern and Texture for Decorative Units:

6. Standard pattern, ground finish.

7. Size: Manufactured with pre-faced surfaces having 1/16-inch- wide returns of facing to create 1/4-inch- wide mortar joints.

CONCRETE AND MASONRY LINTELS

A. General: Provide either concrete or masonry lintels, at Contractor's option, complying with requirements below.
B. Concrete Lintels: Precast units matching concrete masonry units and with reinforcing bars indicated or required to support loads indicated.

C. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Division 03 Section "Cast-in-Place Concrete."
D. Masonry Lintels: Made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout.

MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
B. Hydrated Lime: ASTM C 207, Type S.
C. Masonry Cement: ASTM C 91.

D. Products:
1. TCC Materials, Type S mortar, TCC BOM 101013, 101455

E. Mortar Pigments: Iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.

F. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

G. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
H. Aggregate for Grout: ASTM C 404.
I. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for structural-clay tile facing units.

J. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

a. Products:
ii. Addiment Incorporated; Mortar Kick.
iii. Euclid Chemical Company (The); Accelguard 80.
iv. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Morset.
v. Sonneborn, Div. of ChemRex; Trimix-NCA.
vi. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete masonry units, containing integral water repellent by same manufacturer.

b. Products:
i. Addiment Incorporated; Mortar Tite.
ii. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Dry-Block Mortar Admixture.
iii. Master Builders, Inc.; Color Cure Mortar Admix.
iv. Water: Potable.

REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Masonry Joint Reinforcement: Conform to IBC Standards; mill galvanized, carbon-steel wire for interior walls and hot-dip galvanized, carbon-steel wire for exterior walls.

C. Wire Size for Veneer Ties: W1.7 or 0.148-inch diameter.
D. Veneer Ties in Acsys Panel walls to be Hohman and Bernard “X-Seal” Anchor. All other masonry anchors substitutions to be reviewed and approved by architect.

E. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.

F. Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.188-inch- diameter, hot-dip galvanized, carbon-steel continuous wire.

TIES AND ANCHORS

A. Materials:
   2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153/A 153M, Class B-2 coating.
   3. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, hot-dip galvanized after fabrication to comply with ASTM A 153/A 153M.
   4. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
   5. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.
   6. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.
   7. Wire: Fabricate from 3/16-inch- diameter, hot-dip galvanized steel wire.
   8. Adjustable Anchors for Connecting to Structure: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   9. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire.
   10. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.188-inch- diameter, hot-dip galvanized steel wire.
   11. Adjustable Masonry-Veneer Anchors

B. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

   1. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
   2. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.
   3. Anchor Section: Rib-stiffened, sheet metal plate with screw holes top and bottom, and slotted holes for inserting wire tie.
   4. Fabricate sheet metal anchor sections from [0.067-inch-] [0.097-inch-] thick, steel sheet, galvanized after fabrication.
   5. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from [0.188-inch-] [0.25-inch-] diameter, hot-dip galvanized steel wire.

C. Products
   1. Dayton Superior Corporation, Dur-O-Wal Division; [D/A 213] [or] [D/A 210 with D/A 700-708].
   2. Heckmann Building Products Inc.; 315-D with 316.
   3. Hohmann & Barnard, Inc.; DW-10-X.
   4. Anchor Section: Rib-stiffened, sheet metal plate with screw holes top and bottom, and slotted holes for inserting connector section.

5. Connector Section: Rib-stiffened, sheet metal bent plate; sheet metal clip; or wire tie and rigid extruded vinyl clip designed to engage continuous wire. Size connector to extend at least halfway through veneer but with at least 5/8-inch cover on outside face.
6. Fabricate sheet metal anchor sections and other sheet metal parts from 0.067-inch- thick, steel sheet, galvanized after fabrication.
7. Fabricate wire connector sections from 0.188-inch- diameter, hot-dip galvanized, carbon-steel wire.

EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with Division 07 Section "Sheet Metal Flashing and Trim."

B. Metal Drip Edges: Fabricate from stainless steel or galvanized steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

C. Metal Flashing Terminations: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 3/8 inch to form a stop for retaining sealant backer rod.

D. Flexible Flashing: For flashing not exposed to the exterior, use one of the following, unless otherwise indicated:

E. Through wall flexible flashing.

1. Products:
   b. W.R. Meadows, Air Shield, through wall flexible flashing.
   c. W.R. Meadows, Mel-Prime Water based adhesive.

F. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch.

1. Products:
   b. Advanced Building Products Inc.; Peel-N-Seal.
   c. Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
   d. Dayton Superior Corporation, Dur-O-Wal Division; Dur-O-Barrier-44.
   e. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Perm-A-Barrier Wall Flashing.

MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene or PVC.
B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall.
C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

Weep/Vent Products:

A. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

1. Products:
   b. Advanced Building Products Inc.; Mortar Maze weep vent.

c. Dayton Superior Corporation, Dur-O-Wal Division; Cell Vents.
d. Heckmann Building Products Inc.; No. 85 Cell Vent.
e. Hohmann & Barnard, Inc.; Quadro-Vent.
f. Wire-Bond; Cell Vent.

B. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer's standard.

1. Products:
b. Mortar Net USA, Ltd.; Mortar Net Weep Vents.

C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Provide one of the following configurations:

b. Strips, full-depth of cavity and 10 inches wide, with dovetail shaped notches 7 inches deep.

c. Strips, not less than 1-1/2 inches thick and 10 inches wide, with dimpled surface designed to catch mortar droppings and prevent weep holes from being clogged with mortar.
d. Sheets or strips full depth of cavity and installed to full height of cavity.

1. Products:

a. Advanced Building Products Inc.; Mortar Break.
b. Archovations, Inc.; CavClear Masonry Mat.
c. Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
d. Mortar Net USA, Ltd.; Mortar Net.

D. Weep Vent Drainage System. 2” Base of wall weep area drainage flow composite

1. Products:
b. Mortar Net Solutions, Wall Defender 2”

MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/ grout stains from new masonry without damaging masonry. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

Manufacturers:
Diedrich Technologies, Inc.
EaCo Chem, Inc.
ProSoCo, Inc.

MORTAR AND GROUT MIXES

A. General: Do not use admixtures, unless otherwise indicated.
B. Do not use calcium chloride in mortar or grout.
C. Limit cementitious materials in mortar for exterior masonry to portland cement and lime.
D. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
E. Mortar for Unit Masonry: Comply with IBC Standards, Proportion Specification.

EXECUTION

INSTALLATION, GENERAL

F. Use full-size units without cutting if possible. If cutting is required, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

G. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

H. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

I. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:

1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

C. LAYING MASONRY WALLS
1. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
2.
3. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
4. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
5.
6. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.
7. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
B. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated.
C. Anchor masonry to structural members with anchors embedded in masonry joints and attached to structure.
D. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
B. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners. See Hohman and Bernard X Seal requirements for anchorage into foam applied walls.
C.
D. Embed connector sections and continuous wire in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing or face of Koreteck walls.
E. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
F.
G. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally with not less than 1 anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Install flashing as follows, unless otherwise indicated.

C. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing as recommended by flashing manufacturer.

D. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.

E. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.

F. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal flashing termination.

G. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:

H. Use specified weep/vent products to form weep holes.

I. Space weep holes 24 inches o.c., unless otherwise indicated.

J. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in Part 2 "Miscellaneous Masonry Accessories" Article.

K. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.

L. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

B. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

C. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

D. Placing Reinforcement: Comply with requirements in IBC standards.

FIELD QUALITY CONTROL

A. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.

B.

C. Mortar Test (Property Specification): For each mix provided, per UBC Standard 21-16. Test mortar for mortar air content and compressive strength.

CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
B.
C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
D.
E. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
F.
G. Protect adjacent surfaces from contact with cleaner.
H.
I. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
J.
K. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
L.
M. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
N.
O. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

MASONRY WASTE DISPOSAL

A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
B. Do not dispose of masonry waste as fill within 18 inches of finished grade.
C. Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SPECIFICATION SECTION

SECTION 051200 - STRUCTURAL STEEL FRAMING

SUMMARY

A. Section Includes:

1. Structural steel.
2. Grout.

DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.

C. Heavy Sections: Rolled and built-up sections as follows:

1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches (38 mm).
2. Welded built-up members with plates thicker than 2 inches (50 mm).
3. Column base plates thicker than 2 inches (50 mm).

D. Protected Zone: Structural members or portions of structural members indicated as "Protected Zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.

E. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
5. Indicate locations and dimensions of protected zones.
6. Identify demand critical welds.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand critical welds.

D. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data.

INFORMATIONAL SUBMITTALS

E. Qualification Data: For Installer and fabricator.

F. Welding certificates.

G. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

H. Mill test reports for structural steel, including chemical and physical properties.

I. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shop primers.
5. Nonshrink grout.

J. Survey of existing conditions.

K. Source quality-control reports.

L. Field quality-control and special inspection reports.

QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD**.** If the fabricator does not have the AISC certification they can still bid the project but they are responsible to have a third party inspector inspect the fabrication process to ensure they are meeting AISC guidelines.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector. If the erector does not have the AISC certification they can still bid the project but must be in compliance with Chapter N of AISC's Specification indicating quality control requirements.

C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1 or to SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

E. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 341 and AISC 341s1.
3. AISC 360.
4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PRODUCTS

PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC 360.
2. Use Allowable Stress Design; data are given at service-load level.

B. Moment Connections: Type FR, fully restrained.

C. Construction: Combined system of moment frame and shear walls.

STRUCTURAL-STEEL MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than the following:

1. W-Shapes: 60 percent.
2. Channels, Angles, M , S-Shapes: 60 percent.
3. Plate and Bar: 25 percent.
4. Cold-Formed Hollow Structural Sections: 25 percent.
5. Steel Pipe: 25 percent.
6. All Other Steel Materials: 25 percent.

C. W-Shapes: As Indicated.

D. Channels, Angles**,** M , S-Shapes: As Indicated.

E. Plate and Bar: As Indicated.

F. Corrosion-Resisting Structural-Steel Shapes, Plates, and Bars: As Indicated.

G. Cold-Formed Hollow Structural Sections: As Indicated.

H. Corrosion-Resisting, Cold-Formed Hollow Structural Sections: ASTM A 847/A 847M, structural tubing.

I. Steel Pipe: As Indicated.

1. Weight Class: Standard.
2. Finish: Black except where indicated to be galvanized.

J. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.

K. Steel Forgings: ASTM A 668/A 668M.

L. Welding Electrodes: Comply with AWS requirements.

BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.

B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M, Type 10.9), compressible-washer type with plain finish.

C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH (ASTM A 563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip or mechanically deposited zinc coating.

2. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with mechanically deposited zinc coating finish.

D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Plain.

E. Unheaded Anchor Rods: ASTM F 1554, Grade 36.

1. Configuration: As Indicated.
2. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
3. Plate Washers: ASTM A 36/A 36M carbon steel.
4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
5. Finish: Plain.

F. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-]hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
4. Finish: Plain.

G. Threaded Rods: ASTM A 36/A 36M.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Washers: ASTM A 36/A 36M carbon steel.
3. Finish: Plain.

H. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

I. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

J. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

PRIMER

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Primer: Comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting.", Section 099600 "High-Performance Coatings.".

C. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

D. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

GROUT

E. Metallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

F. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."

F. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural-steel frame. Straighten as required to provide uniform, square, and true members in completed wall framing. Build up welded framing, weld exposed joints continuously, and grind smooth.

G. Welded Door Frames: Build up welded door frames attached to structural-steel frame. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk machine screws, uniformly spaced not more than 10 inches (250 mm) o.c. unless otherwise indicated.

H. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Pretensioned.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

SHOP PRIMING

A. Shop prime steel surfaces except the following:

   1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
   2. Surfaces to be field welded.
   3. Surfaces of high-strength bolted, slip-critical connections.
   4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
   5. Galvanized surfaces.
   6. Surfaces enclosed in interior construction.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

   1. SSPC-SP 2, "Hand Tool Cleaning."
   2. SSPC-SP 3, "Power Tool Cleaning."
   3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
   4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
   5. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
   2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

D. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

   1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
   2. Galvanize lintels and shelf angles and welded door frames attached to structural-steel frame and located in exterior walls.

SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.

   1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

E. Prepare test and inspection reports.

EXECUTION

EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.

3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Pretensioned.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

C. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

    1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

        a. Liquid Penetrant Inspection: ASTM E 165.
        b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
        c. Ultrasonic Inspection: ASTM E 164.
        d. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

    1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
    2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

    1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

D. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

END OF SECTION 051200

SECTION 052100 - STEEL JOIST FRAMING

GENERAL

SUMMARY

A. Section Includes:

1. K-series steel joists.
2. KCS-type K-series steel joists.
3. K-series steel joist substitutes.
4. Joist accessories.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for installing bearing plates in concrete.
2. Section 042000 "Unit Masonry" for installing bearing plates in unit masonry.
3. Section 051200 "Structural Steel Framing" for field-welded shear connectors.

DEFINITIONS

A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

ACTION SUBMITTALS

A. Product Data: For each type of joist, accessory, and product.

B. Shop Drawings:

1. Include layout, designation, number, type, location, and spacing of joists.
2. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.
3. Indicate locations and details of bearing plates to be embedded in other construction.

INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Welding certificates.

C. Manufacturer certificates.

D. Mill Certificates: For each type of bolt.

E. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications**."**

    1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.

B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

SEQUENCING

A. Deliver steel bearing plates to be built into cast-in-place concrete and masonry construction.

PRODUCTS

PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.

    1. Use ASD; data are given at service-load level.
    2. Design special joists to withstand design loads with live-load deflections no greater than the following:
        a. Roof Joists: Vertical deflection of 1/360 of the span.

B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

K-SERIES STEEL JOISTS

A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.

    1. Joist Type: K-series steel joists and KCS-type K-series steel joists.

B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

C. Provide holes in chord members for connecting and securing other construction to joists.

D. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."

E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."

F. Do not camber joists.

G. Camber joists according to SJI's "Specifications."

H. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

JOIST ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications**."** Furnish additional erection bridging if required for stability.

C. Bridging: Fabricate as indicated and according to SJI's "Specifications**."** Furnish additional erection bridging if required for stability.

D. Fabricate steel bearing plates from ASTM A 36/A 36M steel with integral anchorages of sizes and thicknesses indicated. Shop prime paint.

E. Steel bearing plates with integral anchorages are specified in Section 055000 "Metal Fabrications."

F. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface unless otherwise indicated.

G. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: Plain, uncoated.

H. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

1. Finish: Plain.

I. Welding Electrodes: Comply with AWS standards.

J. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

K. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

CLEANING AND SHOP PAINTING

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by power-tool cleaning, SSPC-SP 3.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

D. Shop priming of joists and joist accessories is specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

EXECUTION

EXAMINATION

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications**,"** joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads are applied.

C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts.

E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with Research Council on Structural Connection's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.

F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

B. Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test field welds according to AWS D1.1/D1.1M and the following procedures, as applicable:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709.
c. Ultrasonic Testing: ASTM E 164.
d. Radiographic Testing: ASTM E 94.

C. Visually inspect bolted connections.

D. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

E. Perform additional testing to determine compliance of corrected Work with specified requirements.

PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists**,** bearing plates, abutting structural steel, and accessories.

1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2, or power-tool cleaning according to SSPC-SP 3.
2. Apply a compatible primer of same type as primer used on adjacent surfaces.

C. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

D. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 052100

SECTION 053100 - STEEL DECKING

GENERAL

SUMMARY

A. Section Includes:

1. Roof deck.
2. Form deck (floor)

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.
2. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.
3. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
4. Section 099113 "Exterior Painting" for repair painting of primed deck and finish painting of deck.
5. Section 099123 "Interior Painting" for repair painting of primed deck and finish painting of deck.

ACTION SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings:

1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Product Certificates: For each type of steel deck.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:

1. Power-actuated mechanical fasteners.
2. Acoustical roof deck.

D. Evaluation Reports: For steel deck.

E. Field quality-control reports.

QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

C. Electrical Raceway Units: Provide UL-labeled cellular floor-deck units complying with UL 209 and listed in UL's "Electrical Construction Equipment Directory" for use with standard header ducts and outlets for electrical distribution systems.

D. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PRODUCTS

PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

C. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

D. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

ROOF DECK

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. ASC Profiles, Inc.; a Blue Scope Steel company.
2. Canam United States; Canam Group Inc.
3. CMC Joist & Deck.
4. Consolidated Systems, Inc.; Metal Dek Group.
5. Epic Metals Corporation.
6. New Millennium Building Systems, LLC.
7. Nucor Corp.; Vulcraft Group.
8. Verco Manufacturing Co.

9. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:

1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 33 (230) minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.

   a. Color: Manufacturer's standard.
2. Deck Profile: As indicated.
3. Cellular Deck Profile: As indicated, with bottom plate.
4. Profile Depth: As indicated.
5. Design Uncoated-Steel Thickness: As indicated.
6. Design Uncoated-Steel Thicknesses; Deck Unit/Bottom Plate: As indicated.
7. Span Condition: Triple span or more.
8. Side Laps: Overlapped.

FORM DECK

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. ASC Profiles, Inc.; a Blue Scope Steel company.
2. Canam United States; Canam Group Inc.
3. CMC Joist & Deck.
4. Consolidated Systems, Inc.; Metal Dek Group.
5. Epic Metals Corporation.
6. New Millennium Building Systems, LLC.
7. Nucor Corp.; Vulcraft Group.
8. Verco Manufacturing Co.
9. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

B. Form Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230),G60 (Z180) zinc coating.
2. Profile Depth: As indicated.
3. Design Uncoated-Steel Thickness: As Indicated.
4. Span Condition: Triple span or more.

ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile indicated and recommended by SDI Publication No. 31 for overhang and slab depth.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

H. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.

I. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (1.52 mm) thick, with factory-punched hole of 3/8-inch (9.5-mm) minimum diameter.

J. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.

K. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, with 3-inch- (76-mm-) wide flanges and sloped recessed pans of 1-1/2-inch (38-mm) minimum depth. For drains, cut holes in the field.

L. Galvanizing Repair Paint: ASTM A 780.

M. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

EXECUTION

EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

ROOF-DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as follows:

1. Weld Diameter: 5/8 inch (16 mm), nominal.
2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.
3. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 18 inches (457 mm), and as follows:

1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
2. Mechanically clinch or button punch.
3. Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped 2 inches (51 mm) minimum.

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld flanges to top of deck. Space welds not more than 12 inches (305 mm) apart with at least one weld at each corner.

1. Install reinforcing channels or zees in ribs to span between supports and weld.

E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.

1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

G. Sound-Absorbing Insulation: Installation into topside ribs of deck as specified.

FLOOR-DECK INSTALLATION

A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:

1. Weld Diameter: 5/8 inch (16 mm), nominal.

2. Weld Spacing: Weld edge ribs of panels at each support. Space additional welds an average of 12 inches (305 mm) apart, but not more than 18 inches (457 mm) apart.
3. Weld Spacing: Space and locate welds as indicated.
4. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of half of the span or 36 inches (914 mm), and as follows:

1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
2. Mechanically clinch or button punch.
3. Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped.

D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.

E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

F. Install piercing hanger tabs at 14 inches (355 mm) apart in both directions, within 9 inches (228 mm) of walls at ends, and not more than 12 inches (305 mm) from walls at sides unless otherwise indicated.

FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Field welds will be subject to inspection.

C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

D. Remove and replace work that does not comply with specified requirements.

E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

C. Repair Painting: Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

D. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

GENERAL

SUMMARY

A. Section Includes:
   1. Exterior non-load-bearing wall framing.
   2. Load-bearing wall framing
   3. Ceiling joist framing.
   4. Soffit framing.

B. Related Requirements:

   1. Section 055000 "Metal Fabrications" for masonry shelf angles and connections.
   2. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies.
   3. Section 092216 "Non-Structural Metal Framing" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

ACTION SUBMITTALS

A. Product Data: For each type of cold-formed steel framing product and accessory.

B. Shop Drawings:

   1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
   2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Delegated-Design Submittal: For cold-formed steel metal roof trusses.

INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.

   1. Steel sheet.
   2. Expansion anchors.
   3. Power-actuated anchors.
   4. Mechanical fasteners.
   5. Vertical deflection clips.
   6. Horizontal drift deflection clips

7. Miscellaneous structural clips and accessories.

D. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

D. Comply with AISI S230 "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PRODUCTS

MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AllSteel & Gypsum Products, Inc.
2. California Expanded Metal Products Company.
3. ClarkWestern Building Systems, Inc.
4. Consolidated Fabricators Corp.; Building Products Division.
5. Craco Mfg., Inc.
6. Custom Stud Inc.
7. Design Shapes in Steel.
8. Dietrich Metal Framing; a Worthington Industries Company.
9. Formetal Co. Inc. (The).
10. MarinoWARE.
11. Nuconsteel; a Nucor Company.
12. Olmar Supply, Inc.
13. Quail Run Building Materials, Inc.
14. SCAFCO Corporation.
15. Southeastern Stud & Components, Inc.
16. State Building Products, Inc.
17. Steel Construction Systems.
18. Steel Network, Inc. (The).
19. Steel Structural Systems.
20. Steeler, Inc.
21. Super Stud Building Products, Inc.
22. Telling Industries, LLC.

23. United Metal Products, Inc.
24. United Steel Manufacturing.

PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.

    1. Design Framing: As indicated.

B. Cold-Formed Steel Framing Design Standards:

    1. Floor and Roof Systems: AISI S210.
    2. Wall Studs: AISI S211.
    3. Headers: AISI S212.
    4. Lateral Design: AISI S213.

C. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.

D. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

    1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

COLD-FORMED STEEL FRAMING, GENERAL

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

    1. Grade: As indicated.
    2. Coating: G60 (Z180), A60 (ZF180), AZ50 (AZ150), or GF30 (ZGF90).

C. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:

    1. Grade: As required by structural performance.
    2. Coating: G60 (Z180).

EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

    1. Minimum Base-Metal Thickness: Min. As indicated on Drawings
    2. Flange Width: 1-5/8 inches (41 mm).

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

    1. Minimum Base-Metal Thickness: Matching steel studs.

2. Flange Width: 1-1/4 inches (32 mm).

C. Vertical Deflection Clips: Manufacturer's standard [bypass] [head] clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. AllSteel & Gypsum Products, Inc.
b. ClarkWestern Building Systems, Inc.
c. Dietrich Metal Framing; a Worthington Industries company.
d. MarinoWARE.
e. SCAFCO Corporation.
f. Steel Network, Inc. (The).
g. Steeler, Inc.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:

1. Minimum Base-Metal Thickness: 0.0966 inch (2.45 mm). (Minimum: Match Vertical Stud Gauge)
2. Flange Width: 1 inch (25 mm) plus the design gap for one-story structures and 1 inch (25 mm) plus twice the design gap for other applications.

E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.

1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:

a. Minimum Base-Metal Thickness: 0.0966 inch (2.45 mm)].
b. Flange Width: 1 inch (25 mm) plus the design gap for one-story structures] and 1 inch (25 mm) plus twice the design gap for other applications.

2. Inner Track: Of web depth indicated, and as follows:

a. Minimum Base-Metal Thickness: 0.0966 inch (2.45 mm)].
b. Flange Width: Dimension equal to sum of outer deflection track flange width plus 1 inch (25 mm).

F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: As indicated on Drawings
2. Flange Width: As Indicated on Drawings

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: Matching steel studs.

2. Flange Width: 1-1/4 inches (32 mm).

C. Vertical Deflection Clips: Manufacturer's standard [bypass] [head] clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. AllSteel & Gypsum Products, Inc.
b. ClarkWestern Building Systems, Inc.
c. Dietrich Metal Framing; a Worthington Industries company.
d. MarinoWARE.
e. SCAFCO Corporation.
f. Steel Network, Inc. (The).
g. Steeler, Inc.

D. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

CEILING JOIST FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, punched with standard holes, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0329 inch (0.84 mm).
2. Flange Width: 1-5/8 inches (41 mm) minimum.

SOFFIT FRAMING

A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0329 inch (0.84 mm).
2. Flange Width: 1-5/8 inches (41 mm), minimum.

FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Gusset plates.
8. Stud kickers and knee braces.
9. Joist hangers and end closures.
10. Hole reinforcing plates.

11. Backer plates.

ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

F. Welding Electrodes: Comply with AWS standards.

MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.

D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

FABRICATION

A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.

3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

    a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.

4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

EXECUTION

EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

C. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.

D. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).

D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

J. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: As Indicated.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deep-leg deflection tracks and anchor to building structure.
2. Install double deep-leg deflection tracks and anchor outer track to building structure.
3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
4. Connect drift clips to cold-formed metal framing and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.

1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.

    a. Install solid blocking at centers indicated on Shop Drawings.

2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055133 - PREFABRICATED METAL STAIRS AND LADDERS

SECTION INCLUDES

Prefabricated, fixed aluminum vertical ladders

REFERENCES

A. ANSI A14.3: Ladders - Fixed - Safety Requirements.
B. OSHA 1910.27: Fixed Ladders.

SUBMITTALS

A. Submit under provisions of Section SUBMITTALS
    1. Plan and section of ladder installation.
B. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
    1. Preparation instructions and recommendations.
    2. Storage and handling requirements and recommendations.
    3. Installation methods.

DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store products until installation inside under cover. If stored outside, under a tarp or suitable cover.

WARRANTY

A. Limited Warranty: Five years against defective material and workmanship, covering parts only, no labor or freight. Defective parts, if deemed so by the manufacturer, will be replaced at no charge, freight excluded, upon inspection at manufacturer's plant which warrants same.

PRODUCTS

MANUFACTURER

A. Acceptable Manufacturer: Precision Ladders, LLC, which is located at: P. O. Box 2279 ; Morristown, TN 37816-2279; Toll Free Tel: 800-225-7814; Tel: 423-586-2265; Email: info@PrecisionLadders.com; Web: www.PrecisionLadders.com
B. Alternate manufacturers will be accepted. Provide submittal data for architect's review and approval. Requests for substitutions will be considered in accordance with provisions of SUBMITTAL Section

ALUMINUM FIXED VERTICAL LADDER

A. Aluminum Fixed Vertical Ladder and Components: Ladder, cage, rest platforms, floor mounting brackets, security doors, walk-thru, and side rails.
    1. Model: Model FL -*** (***= vertical height in inches) Aluminum Fixed Vertical Ladder as manufactured by Precision Ladders LLC.
    2. Capacity: Unit shall support a 1000 lb (454 kg) loading without failure.
    3. Performance Standard: Units designed and manufactured to meet or exceed ANSI A14.3 and OSHA 1910.27.

B. Components:

    1. Ladder Stringer: 2-1/2 inch by 1-1/16 inch by 1/8 inch (64 mm by 27 mm by 3 mm) extruded 6005-T5 aluminum channel. Pitch: 90 degrees.
    2. Ladder Tread: 2-1/4 inch by 3/4 inch by 1/4 inch (57 mm by 19 mm by 6 mm) extruded 6005-T5 aluminum with deeply serrated top surface.
    3. Ladder Mounting Bracket: 8-1/2 inch by 2 inch by 3 inch by 1/4 inch thick (216 mm by 51 mm by 76 mm by 6 mm) aluminum angle.
    4. Walk-Thru (SEE DRAWINGS FOR REQUIREMENT):
        a. Hand Rails: 1-1/4 inch (32 mm) aluminum square tube with rounded edges.
        b. Mounting Brackets: 4 inch by 4 inch by 1/4 inch (102 mm by 102 mm by 6 mm) aluminum.
        c. Side Rails: 42 inch (1067 mm) side rail extension for through ladder exits.

5. Safety Cage (SEE DRAWINGS FOR REQUIREMENT):
   Vertical and horizontal bars: 1/4 inch by 2 inch (6 mm by 51 mm) 6005-T5 aluminum flat bar.
6. Rest Platform (SEE DRAWINGS FOR REQUIREMENT):
   a. 1/8 inch (3 mm) aluminum tread plate.
   b. Platform Size: 30” inches by 48 inches (762 mm by 1219 mm) standard.
   c. Toe Boards. 6005 T-5 aluminum.
   d. Handrails: 1-1/4 inch (32 mm) aluminum square tube 42 inches (1067 mm) high.
7. Security Door: 0.125 inch (3 mm) 3003-H14 aluminum panel 84 inches (2134 mm) tall with padlock provision.
8. Security Gate: Hinged gate at bottom of cage with padlock provision.
9. Fall Prevention System: Complete system with rail, sleeves, and harness to limit any fall to 6 inches (152 mm) or less.
10. Floor Brackets: Floor bracket at foot of each stringer, 3 by 2 by 1/4 inch (76 by 51 by 6 mm).
11. Finishes:
    a. Standard: Mill finish on aluminum ladder components.

FABRICATION

A. Completely fabricate ladder ready for installation before shipment to the site.
B. Completely fabricate handrail components and ship to site ready for field assembly and attachment to ladder.

EXECUTION

EXAMINATION

A. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
B. Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

INSTALLATION

A. Install in accordance with manufacturer's instructions.

PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SPECIFICATION SECTION

SECTION 061000 - ROUGH CARPENTRY

SUMMARY

A. Types of work in this section include rough carpentry for:

1. Wood framing including exterior walls.
2. Timbers for posts and beams.
3. Wood grounds, nailers, and blocking.
4. Wood furring.
5. Sheathing.
6. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.

PART 1 - GENERAL

SUBMITTALS

1. Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in form of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board or Review of American Lumber Standards Committee.

PRODUCT HANDLING:

1. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary covering including polyethylene and similar materials.

    A. For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

PROJECT CONDITIONS:

1. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachments of other work.

PART 2 - PRODUCTS

LUMBER GENERAL

1. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standards" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

2. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

    A. RIS - Redwood Inspection Service.
    B. NLGA - National Lumber Grades Authority (Canadian).
    C. SPIB - Southern Pine Inspection Bureau.
    D. WCLIB - West Coast Lumber Inspection Bureau.
    E. WWPA - Western Wood Products Association.

3. Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

    A. For exposed lumber apply grade stamps to ends or back of each piece, or omit grade stamps entirely and issue certificate of grade compliance from inspection agency in lieu of grade stamp.

4. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.

    A. Provide dressed lumber, S4S, unless otherwise indicated.
    B. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.
    C. Provide lumber with 15 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

DIMENSIONAL LUMBER:

A. For non-strutural light framing provide "Stud" or "Standard" grade lumber for stud framing, (2" to 4" thick, 2" to 6" wide, 10' and shorter) and "Standard" grade for other light framing (2" to 4" thick, 2" to 4" wide), any species.

B. For non-structural light framing (2" to 4" thick, 2" to 4" wide), provide the following grade and species:

    1. Standard grade.
    2. Any species graded under WWPA or WCLIB rules.

C. For structural light framing (2" to 4" thick, 2" to 4" wide), REFER TO THE STRUCTURAL PLANS FOR GRADE AND SPECIES.

D. For structural framing (2" to 4" thick, 5" and wider), REFER TO THE STRUCTURAL PLANS FOR GRADE AND SPECIES.

BOARDS:

A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:
    3. Moisture Content: 19 percent maximum, “S-DRY".
    4. Moisture Content: 15 percent maximum, "MC-15".
    5. Where painted finish is indicated, provide No. 1 Boards per SPIB rules, select Merchantable Boards per WCLIB rules or No. 2 Common Boards & Better per WWPA rules.

B. Concealed Boards: Where boards will be concealed by other work, provide lumber of 19 percent maximum moisture content (S-DRY) and of following species and grade:
    1. Redwood Construction Common per RIS rules, Southern Pine No. 2 Boards per SPIB rules, or any species graded Construction Boards per WCLIB or WWPA rules,
    2. Redwood Merchantable per RIS rules, Southern Pine No. 2 Boards per SPIB rules, or any species graded Standard or No. 3 Common Boards per WCLIB or WWPA rules.

C. Board Sizes: Provide sizes indicated or, if not indicated (for sheathing, subflooring and similar uses), provide 1" x 8" boards.

MISCELLANEOUS LUMBER:

A. Provide wood for support or attachment of other work including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown.

B. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

C. Grade: Standard Grade light framing size lumber of any species or board size lumber as required. No. 3 Common or Standard grade boards per WCLIB or WWPA rules or No. 3 boards per SPIB rules.

CONSTRUCTION PANELS:

A. Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood panels and, for products not manufactured under PS 1 provisions, with American Plywood Association (APA) "Performance Standard and Policies for Structural-Use Panels", Form No. E445.

B. Trademark: Factory-mark each construction panel with APA trademark evidencing compliance with grade requirements.

C. Concealed APA Performance-Rated Panels: Where construction panels will be used for the following concealed types of applications, provide APA Performance-Rated Panels complying with requirements indicated for grade designations, span rating, exposure durability classification, edge detail (where applicable) and thickness.

1. Wall Sheathing: APA RATED SHEATHING.
   d. Exposure Durability Classification: EXTERIOR
   e. Span Rating: As indicated in the structural drawings.

2. Roof Sheathing: APA RATED SHEATHING.
   a. Exposure Durability Classification: EXTERIOR
   b. Span Rating: As indicated in the structural drawings.

D. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant treated plywood panels with grade designation, APA C-D PLUGGED INT with exterior glue, in thickness indicated, or, if not otherwise indicated, not less than 15/32".

MISCELLANEOUS MATERIALS:

A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.

1. Where rough carpentry work is exposed to weather, in ground contact, or in area of high realative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153).
   b. Building Paper: ASTM D 226, Type I; asphalt saturated felt, non-perforated, 15-lb. type.
   c. Sill Sealer Gaskets: Glass fiber resilient insulation fabricated in strip form for use as a sill sealer; 1" nominal thickness compressible to 1/32"; selected from manufacturer's standard widths to suit width of sill members indicated; in rolls of 50' or 100' in length.

WOOD TREATMENT BY PRESSURE PROCESS:

A. Preservative Treatment: Where lumber or plywood is indicated as "Trt-Wd" or "Treated", or is specified herein to be treated, comply with applicable requirements of AWPA Standards C2 (Lumber) and C9 (Plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.

1. Pressure-treat above-ground items with water-borne preservatives to comply with AWPB LP-2. After treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:
   d. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
   e. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.
   f. Wood framing members less than 18" above grade.
   g. Wood floor plates installed over concrete slabs directly in contact with earth.

2. Pressure-treat the following with water-borne preservatives for ground contact use complying with AWPB LP-22:
   a. Wood members in contact with ground.
   b. Wood members in contact with fresh water.

3. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment and to comply with AWPA M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

PART 3 - EXECUTION

INSTALLATION, GENERAL:

A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

B. Set carpentry work to required levels and lines, with members plumb and true and cut and fitted.

C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.

D. Countersink nail heads on exposed carpentry work and fill holes.
E. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

WOOD GROUNDS, NAILERS, BLOCKING AND SLEEPERS:

A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

C. Provide permanent grounds of dressed, preservative treated, key-bevelled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

WOOD FRAMING, GENERAL:

A. Provide framing members of sizes and on spacings shown, and frame openings as shown, or if not shown, comply with recommendations of "Manual for House Framing" of National Forest Products Association (N.F.P.A.). Do not splice structural members between supports.

B. Anchor and nail as shown, and to comply with "Recommended Nailing Schedule" of "Manual for House Framing" and "National Design Specifications for Wood Construction" published by N.F.P.A.

C. Firestop concealed spaces of wood framed walls and partitions at each floor level and at the ceiling line of the top story. Where firestops are not automatically provided by the framing system used, use closely-fitted wood blocks of nominal 2" thick lumber of the same width as framing members.

STUD FRAMING:

A. General: Provide stud framing of size and spacing indicated or, if not otherwise indicated, of the following sizes and spacings. Arrange studs so that wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using 2" thick members with widths equaling that of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor plates to supporting construction.
    4. For exterior walls and at elevator shaft provide 2" x 6" wood studs.
    5. For interior partitions and walls provide 2" x 4" wood studs spaced 16" o.c.

B. Construct corners and intersections with not less than 3 studs. Provide miscellaneous blocking and framing as shown and as required for support of facing materials, fixtures, specialty items and trim.
    1. Provide continuous horizontal blocking row at mid-height of single-story partitions over 8' high and at midpoint of multi-story partitions, using 2" thick members of same width as wall or partitions.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.
   1. For non-bearing partitions, provide double-jamb studs and headers not less than 4" deep for openings 3' and less in width, and not less than 6" depth or wider openings.
   2. For load-bearing partitions, provide double-jamb studs for openings 6' and less in width, and triple-jamb studs for wider openings. Provide headers of depth shown, or if not shown, provide as recommended by N.F.P.A. "Manual for House Framing".

D. Provide diagonal bracing in stud framing of exterior walls, except as otherwise indicated. Brace both walls at each external corner, full story height, at a 45 degree angle, using either a let-in 1 x 4 or 2 x 4 blocking or metal diagonal bracing. Omit bracing where following types of sheathing are indicated.
   1. Plywood sheathing or corner bracing, 4' wide panels vertically.
   2. Gypsum sheathing, 4' panels vertically.
   3. Fiberboard sheathing, intermediate type, 4' panels vertically.
   4. Diagonal board sheathing.

END OF SECTION 061000.

SECTION 064116 - PLASTIC LAMINATE CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

SUMMARY

A. Plastic-laminate-faced architectural cabinets.
B. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets that are not concealed within other construction.

COORDINATION

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related unit of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

SUBMITTALS

A. Include plans, elevations, sections, and attachment details.
B. Show large-scale details.
C. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
D. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.

SAMPLES

A. Samples: For each exposed product and for each color and texture specified, in manufacturer's or fabricator's standard size.

B. Samples for Initial Selection: For each type of exposed finish.

C. Samples for Verification: For the following:
    1. Plastic Laminates: **8 by 10 inches** for each type, color, pattern, and surface finish required.
        a. Provide one sample applied to core material with specified edge material applied to one edge.
    2. Thermoset Decorative Panels: **8 by 10 inches** for each color, pattern, and surface finish.
        a. Provide edge banding on one edge.
    3. Exposed Cabinet Hardware and Accessories: One full-size unit for each type and finish.

INFORMATIONAL SUBMITTALS

A. Qualification Data: For installer and fabricator, if separate.

B. Product Certificates: For each type of product, including:
    1. Composite wood and agrifiber products.
    2. Thermoset decorative panels.
    3. High-pressure decorative laminate.
    4. Glass.
    5. Adhesives.

C. Quality Standard Compliance Certificates: AWI Quality Certification Program

D. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Installer Qualifications: Fabricator of similar products with min 10 years experience.

DELIVERY STORAGE & HANDLING:

A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between **60 and 80 deg F** and relative **humidity between 25 and 55 percent** during the remainder of the construction period.

C. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.

D. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

PLASTIC LAMINATE FACED ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of cabinets indicated for construction, finishes, installation, and other requirements.
   1. Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that woodwork complies with requirements of grades specified.
   2. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

B. Grade: Custom

C. Type of Construction: Frameless

D. Door and Drawer-Front Style: Flush overlay.
   1. Reveal Dimension: 1/2 inch

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Wilsonart LLC; Decorative Plastic Laminates or a comparable product by one of the following:
      a. Abet Laminati Inc.
      b. Formica Corporation.
      c. Lamin-Art, Inc.
      d. Pionite; a Panolam Industries International, Inc. brand.
      e. OR approved equal.

F. Laminate Cladding for Exposed Surfaces:
   1. Horizontal Surfaces: Grade HGS
   2. Postformed Surfaces: Grade HGP.
   3. Vertical Surfaces: Grade HGS
   4. Edges: ABS/PVC extruded fabrication.
   5. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.

G. Materials for Semiexposed Surfaces:
   1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
      a. Edges of Plastic-Laminate Shelves: ABS/PVC extruded fabrication.
      b. Edges of Thermoset Decorative Panel Shelves: ABS/PVC extruded fabrication.
      c. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of NEMA LD 3, Grade VGL thermoset decorative panels] [NEMA LD 3, Grade VGS high-pressure decorative laminate
   2. Drawer Sides and Backs: Thermoset decorative panels with ABS/PVC extrusion edge banding.
   3. Drawer Bottoms: Thermoset decorative panels.

H. Dust Panels: 1/4-inch plywood or tempered hardboard above compartments and drawers unless located directly under tops.

I. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: NEMA LD 3, Grade VGL thermoset decorative panels.

J. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
   1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners.

K. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   1. As specified in Finish Schedule.

WOOD MATERIALS:

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: 8 to 13 percent.

B. Composite Wood Products: Products shall be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.
   1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
   2. Particleboard: ANSI A208.1 Grade M-2-Exterior Glue.
   3. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.
      a. Basis-of-Design Product: Subject to compliance with requirements, provide Wilsonart LLC; Thermally Fused Laminate Panels or a comparable product by one of the following:
         1) Abet Laminati Inc.
         2) Arborite.
         3) Lamin-Art, Inc.

CABINET HARDWARE AND ACCESSORIES:

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section "Door Hardware.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Accuride International.
      b. Blum, Julius & Co., Inc.
      c. CompX International, Inc.
      d. Knape & Vogt Manufacturing Company.

B. Butt Hinges: 2-3/4-inch five-knuckle steel hinges made from 0.095-inch thick metal, and as follows:
   1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
   2. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.

C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening.

D. Back-Mounted Pulls: BHMA A156.9, B02011.

E. Wire Pulls: Back mounted, solid metal 5 inches long, 2-1/2 inches deep, and 5/16 inch in diameter.

F. Catches: Push-in magnetic catches, BHMA A156.9, B03131.

G. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

H. Shelf Rests: BHMA A156.9, B04013; metal.

I. Drawer Slides: BHMA A156.9.
   1. Grade 1 and Grade 2: Side mounted and extending under bottom edge of drawer.
      a. Type: Partial extension.
      b. Material: Zinc-plated steel with polymer rollers.
   2. Grade 1HD-100 and Grade 1HD-200: Side mounted; full -extension type; zinc-plated-steel ball-bearing slides.
   3. For drawers not more than 3 inches high and not more than 24 inches wide, provide Grade 2.
   4. For drawers more than 3 inches high, but not more than 6 inches high and not more than 24 inches wide, provide Grade 1**.**
   5. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-100.
   6. For computer keyboard shelves, provide Grade 1HD-100.
   7. For trash bins not more than 20 inches high and 16 inches wide, provide Grade 1HD-200.

J. Slides for Sliding Glass Doors: BHMA A156.9, B07063; aluminum.

K. Door Locks: BHMA A156.11, E07121.

L. Drawer Locks: BHMA A156.11, E07041.

M. Door and Drawer Silencers: BHMA A156.16, L03011.

N. Grommets for Cable Passage: **1-1/4-inch** OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
   1. Color: **Black**.

O. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
   1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.
   2. Bright Brass, Clear Coated: BHMA 605 for brass base; BHMA 632 for steel base.
   3. Bright Brass, Vacuum Coated: BHMA 723 for brass base; BHMA 729 for zinc-coated-steel base.
   4. Satin Brass, Blackened, Bright Relieved, Clear Coated: BHMA 610 for brass base; BHMA 636 for steel base.
   5. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
   6. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.
   7. Satin Stainless Steel: BHMA 630.

P. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

MISC. MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Adhesive for Bonding Plastic Laminate: Contact cement.
   1. Adhesive for Bonding Edges: Hot-melt adhesive.

FABRICATION

E. Fabricate architectural cabinets to dimensions, profiles, and details indicated.

F. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Notify Architect seven days in advance of the dates and times architectural cabinet fabrication will be complete.
   2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

G. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs. For decorative plastic laminates, comply with manufacturer's written fabrication instructions.

PART 3 - EXECUTION

PREPARATION

A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

INSTALLATION

A. Grade: Install cabinets to comply with quality standard grade of item to be installed.

B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

D. Install cabinets level, plumb, and true in line to a tolerance of **1/8 inch in 96 inches** using concealed shims.
   1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
   2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
   3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish**.**

ADJUSTING & CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semi-exposed surfaces. Clean decorative plastic laminate surfaces according to manufacturer's written care and maintenance instructions.

D. Protect completed work from damage for duration of construction period.

END OF SPECIFICATION SECTION 064116

SECTION 071110 - BITUMINOUS DAMPPROOFING

Summary of this section:

Adjust list below to suit Project.

Cold-applied, emulsified-asphalt dampproofing.

PRODUCTS

COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ChemMasters Corp.
2. Degussa Building Systems; Sonneborn Brand Products.
3. Gardner Gibson, Inc.
4. Henry Company.
5. Karnak Corporation.
6. Koppers Inc.
7. Malarkey Roofing Products.
8. Meadows, W. R., Inc.
9. Tamms Industries, Inc.

MISCELLANEOUS MATERIALS

1. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended by manufacturer.
2. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I. (Applied to all cold joints)

PREPARATION

Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

APPLICATION, GENERAL

Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.

Apply dampproofing to footings and foundation walls where opposite side of wall faces occupied space.

Apply from finished-grade line to top of footing; extend over top of footing, and down a minimum of 6 inches over outside face of footing.

Extend 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.

Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

On Concrete Foundations: Apply 2 brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat, 1 fibered brush or spray coat at not less than 3 gal./100 sq. ft., or 1 trowel coat at not less than 4 gal./100 sq. ft..

INSTALLATION OF PROTECTION COURSE

Where indicated on drawings, install protection course over completed-and-cured dampproofing. Comply with dampproofing material manufacturer's written recommendations for attaching protection course.

END OF SECTION 071110

SECTION 072100 - THERMAL INSULATION

SUMMARY

1. Perimeter wall insulation (supporting backfill).
2. Concealed building insulation (attics and walls).
3. Exposed building insulation.
4. Vapor retarders (inside face of perimeter exterior walls).
5. Sound attenuation insulation.
6. Building Wrap (outside face of perimeter exterior walls).
7. See specification section 072200 for flat roof rigid insulation specification.

SUBMITTALS

1. Provide written technical data and warranty information for approval consistent with the SUBMITTALS section of this document.

PRODUCTS

FOAM-PLASTIC BOARD INSULATION – See drawings for applicability

Extruded-Polystyrene Board Insulation: ASTM C 578, Type VI, 1.80 lb/cu. ft., with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:

Manufacturers:

1. DiversiFoam Products.
2. Dow Chemical Company.
3. Owens Corning.
4. Pactiv Building Products Division.

Molded-Polystyrene Board Insulation: ASTM C 578, Type VIII, 1.15 lb/cu. ft., with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively.

Manufacturers:

1. DiversiFoam Products.

GLASS-FIBER BLANKET INSULATION

Manufacturers:

1. CertainTeed Corporation.
2. Guardian Fiberglass, Inc.
3. Johns Manville.
4. Knauf Fiber Glass.
5. Owens Corning.

Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics. Unfaced insulation allowed in interior cavity walls that are completely encased in 5/8” gypsum drywall. All unfaced insulation exposed in plenum to be covered in 5/8” gypsum drywall or in approved insulation facing material complying with the applicable flame spread and developed smoke index for the project (see code review sheet).

1. 3-5/8 inches thick with a thermal resistance of 11 deg F x h x sq. ft./Btu at 75 deg F.
2. 5-1/2 inches thick with a thermal resistance of 21 deg F x h x sq. ft./Btu at 75 deg F.
3. 10 inches thick with a thermal resistance of 30 deg F x h x sq. ft./Btu at 75 deg F.

VAPOR RETARDERS (VERTICAL APPLICATION ABOVE SLAB).

Polyethylene Vapor Retarders: ASTM D 4397, 6-mils thick, with maximum permeance rating of 0.13 perm.

Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

INSTALLATION, GENERAL

1. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
2. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
3. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
4. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
5. NO INSULATION WITHOUT PLENUM RATED FACING SHALL BE LEFT EXPOSED ABOVE CEILING LINE.

INSTALLATION OF PERIMETER INSULATION

1. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.
2. Extend perimeter insulation to T.O. footing.
3. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

INSTALLATION OF GENERAL BUILDING INSULATION

1. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
2. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
3. Maintain 3-inch clearance of insulation around recessed lighting fixtures.
4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.
6. NO INSULATION WITHOUT PLENUM RATED FACING SHALL BE LEFT EXPOSED ABOVE CEILING LINE.

INSTALLATION OF VAPOR RETARDERS

1. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
2. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.
3. Before installing vapor retarder, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
4. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
5. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
6. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

INSTALLATION OF AIR INFILTRATION BARRIER

1. Install vapor permeable building wrap to outside face of exterior sheathing prior to exterior finish.
2. Install vapor permeable building wrap as directed by manufacturer.

END OF SECTION 072100

SECTION 072200 - RIGID ROOF INSULATION

SUMMARY
This section covers all rigid roof insulation under flat roof areas as called out on the project.

REFERENCES
A. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Insulation Board.

SUBMITTALS
A. Submit under provisions of SUBMITTAL section.
B. Product Data
   1. Manufacturer's Specs
   2. Installation Instructions for insulation board and fasteners.
C. Samples not required for submittal

DELIVERY STORAGE AND HANDLING
A. Deliver insulation in packages labelled with material name, thermal value and product code. When stored outdoors, stack insulation on pallets above ground or roof deck and cover with tarpaulin or other suitable waterproof coverings. Slit or remove manufacturer´s packaging before covering with waterproof covering.

MANUFACTURERS
A. Atlas Roofing Corporation.
B. GAF
C. Or approved equal. Provide architect full manufacturer product data via submittal for review. GC to provide cost difference of approved equal to the two preferred manufacturers for determination.

PRODUCTS
A. Atlas Roofing Company. ACFoam-IV: Closed-cell HCFC FREE "Green" polyisocyanurate foam core manufactured using HCFC blowing agent and integrally laminated to heavy non- asphaltic fiber-reinforced felt facers; FM [1-90] wind uplift classification; compressive strength 25 PSI.
B. GAF EnergyGuard Polyiso insulation board. Glass fiber reinforced cellulostaic felts facers bonded to isocyanurate foam core. Grade 3 25 psi.
C. All products must maintain R30 thermal performance and 25 PSI compressive strength.
D. Non-polyiso products will be considered, including EPS and XPS rigid insulation. All products must maintain minimum R-values (by increasing thickness) and be compatible substrates under the TPO roofing assemblies. Submit product data for architect's review and approval via submittal.

EXECUTION
A. Examine roof deck for suitability to receive insulation. Verify that substrate is dry, clean and free of foreign material that will damage insulation or impede installation
B. Verify that roof drains, scuppers, roof curbs, nailers, equipment supports, vents and other roof accessories are secured properly and installed in conformance with Contract Drawings and submittals.
C. Verify that deck is structurally sound to support installers, materials and equipment without damaging or deforming work.
D. Start of installation indicates installer accepts conditions of existing deck surfaces.
E. Install specified insulation using approved mechanical fasteners in accordance with manufacturer´s latest written instructions and as required by governing codes and Owner´s insurance carrier.
F. Install with end joints staggered to avoid having insulation joints coinciding with joints in deck. In multilayer installations, stagger joints in top and bottom layers.
   Remove trash and construction debris from insulation surface prior to application of roofing membrane.
   Protect installed insulation and roof cover from traffic by use of protective covering materials during and after installation

END OF SECTION 072200

SECTION 074113 AND 074213 - METAL ROOF

Description

Section Includes preformed metal roof and wall panel system including closures, related sheet metal trim, fasteners, and sealants

Submittals

1. Shop Drawings by manufacturer only (3).
2. Manufacturer's data sheet including all accessories (3)
3. Samples (3) 12" long section of specified panel width and finish

Delivery, Storage, and Handling

1. Protect components using best practices to prevent abrasion damage, mechanical abuse, staining discoloration, or corrosion during manufacturing, shipment and storage.
2. Secure panels where they are protected from wind and moisture, while allowing proper drainage and air circulation
3. Any unsatisfactory components will be rejected and/or reproduced to meet quality criteria

Job Conditions

1. Coordinate work with related or adjoining trades to prevent damage to stored or installed components
2. Verify acceptable storage loads on roof slopes
3. Precise location of all roof penetrations shall be verified prior to final roof layout (adjust mechanical vent final locations).

Finish/Substrate Warranty

Provide manufacturer's standard form 20 yr finish warranty stating that the finish will not peel, check, crack, chalk, or fade more than 5 E units.

Metal Roof System

"Battenlock" provided by MBCI or equal

1. Width: 16"
2. Maximum panel length of 40' (Stagger panel laps per manufacturer's written direction).

Substitutions

Shall fully comply with specified requirements in appearance, assembly, and performance. Submit (3) submittals to architect for review / approval.

Finishes

1. Roof: Fluropon coating factory applied, oven-baked finishes based on polyvinylidene fluoride resin (Kynar 500 PVDF Resin-Based). Fluropon coatings manufactured by Valspar The back side of the material should be .25 mil. Primer and a 0.25 polyester washcoat

Accessories

1. Panel shall be attached to substrate at a maximum spacing determined by manufacturer; reference panel fastener locations schedule for manufacturer's approved fastener pattern.
2. All fasteners for panel, trim, and structural member attachment will be supplied by metal wall and soffit system manufacturer.
3. Trim and flashing will be of the same gauge and finish unless approved otherwise by the metal roof system manufacturer.
4. Sealants and Sealant Tapes will be specified and supplied by the metal roof and wall system manufacturer.

Panel Installation

1. Protective film should be removed prior to extended exposure to sunlight, heat, and other weather elements
2. Panels should be handled at seams to prevent buckling
3. Consult with adjoining trades to prevent unnecessary damage to the finish
4. Install continuous length panels plumb, level, and straight with seams and ribs parallel
5. Install panels without excessive waves, warps, or buckles

Panel and Flashing Installation

1. All trim shall be installed using the fastener type and spacing in accordance with manufacturer's instructions
2. Fabricate and install sheet metal flashing in accordance with SMACNA manual
3. In the process of sheet metal installation, allow no sealant to migrate onto exposed surfaces
4. Any damaged product should be removed and replaced immediately upon recognition
5. Touch up paint should be used minimally for minor scratches. Major scratches or paint failures shall be recognized at damaged and require replacement
6. Clean exposed surfaces upon completion of installation to prevent finish damage

END OF SECTION 074113

SECTION 074213 - METAL COMPOSITE MATERIAL WALL PANELS

GENERAL

SECTION INCLUDES

G. Concealed fastener MCM wall panels (route & return rain screen).

DEFINITIONS

A. MCM: Metal Composite Material is two sheets of smooth metal continuously thermo-bonded to a solid Fire Retardant (FR) core under precise temperature, pressure, and tension.

B. DBVR: Drained & Back-Ventilated Rainscreen is a system designed to manage and limit water from contacting the air/water barrier and allowing for the subsequent drying within the cavity via ventilation.

C. PER: Pressure Equalized Rainscreen is a system designed to equalize pressure between interior cavities to prevent water from contacting the air/water barrier and allowing for the subsequent drying within the cavity via ventilation.

PREINSTALLATION MEETINGS

A. Meet with Owner, Architect, Owner's insurer if applicable, MCM panel Fabricator and Installer, MCM sheet manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects MCM panels, including installers of doors, windows, and louvers.
B. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
C. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
D. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect MCM panels.
E. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
F. Review temporary protection requirements for MCM panel assembly during and after installation.
G. Review procedures for repair of panels damaged after installation.
H. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

QUALITY ASSURANCE

A. MCM Manufacturer Qualifications: An entity that has successfully manufactured MCM at a domestically located factory for a minimum of 5 years.

B. MCM Fabricator Qualifications: An entity that has successfully fabricated and assembled MCM panels and approved by the MCM manufacturer.

C. MCM Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by MCM Fabricator.

D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for MCM fabrication and installation.

1. Build mockup of typical MCM panel assembly including supports, attachments, and accessories.

2. Water-Spray Test: Conduct water-spray test of mockup of MCM panel assembly, testing for water penetration in accordance with AAMA 501.2.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. MCM system fabricator to provide shop drawings including fabrication and installation layouts of MCM panels; details of edge conditions, joints, panel profiles, corners, attachment assembly, trim, flashings, closures, and accessories.
2. Accessories: Include details of the flashing, trim and anchorage, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of MCM panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. MCM Panels: 12 inches (305 mm) long by actual panel width. Include fasteners, closures, and other MCM panel accessories. Submit custom color samples in paint manufacturer's standard size.

E. Product Test Reports: For each product, tests performed by a qualified testing agency.

1. MCM Manufacturer's Material Test Reports: Certified test reports showing compliance with specific performance or third-party listing documenting compliance to comparable code sections IBC 1407.14 and IBC 1703.5.
2. MCM System Fabricator's Certified System Tests Reports: Certified system test reports showing system compliance with specific performance or third-party listing documenting compliance code section. Base performance requirements on MCM system type provided.

a. DBVR System: Tested to AAMA 509.
b. PER System: Tested to AAMA 508.
c. NFPA 285.

F. Field quality-control reports.

G. Sample Warranties.

CLOSEOUT SUBMITTALS

1. Maintenance Data: For MCM panels to include in maintenance manuals.

DELIVERY, STORAGE, AND HANDLING

A. Deliver components, MCM panels, and other manufactured items so as not to be damaged or deformed. Package MCM panels for protection during transportation and handling.

B. Unload, store, and erect MCM panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack MCM panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store MCM panels to ensure dryness, with positive slope for drainage of water. Do not store MCM panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on MCM panels during installation.

FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of MCM panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

COORDINATION

A. Coordinate MCM panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

WARRANTY

A. Refer to Manufacturer’s standard terms and conditions.

B. Material Warranty: Submit the Manufacturer’s standard form agreeing to furnish fabrication, labor and material to repair or replace MCM that exhibits defects within the specified warranty period.

1. Coverage Includes:

a. Delamination of metal bond to the fire retardant core.

2. Warranty Period: 10 years from date of Substantial Completion

C. Workmanship Warranty: Submit the Fabricator/Installer’s standard form agreeing to furnish fabrication, labor and material required to repair or replace work which exhibits workmanship defects within the specific warranty period.

1. Warranty Period: 2 years from the date of Substantial Completion.

D. Warranty on Panel Finishes: Submit the Manufacturer's standard form agreeing to furnish fabrication, labor and material to repair or replace MCM panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Coverage includes:

a. Color fading more than (5) Delta E units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of the paint to adhere to the bare metal substrate.

2. Warranty Period: 20 years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide MCM panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E330:

1. Wind Loads: As indicated on Drawings.
2. Panel Deflection Limit: For wind loads, no greater than 1/60 of the span.
3. Framing Member Deflection Limits: For wind loads, no greater than 1/175 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) of wall area when tested in accordance with ASTM E283 at a test-pressure difference of 6.24 lbf/sq. ft. (300 Pa).

C. Water Penetration under Static Pressure: No water penetration to room side of assembly when tested for 15 minutes in accordance with ASTM E331 a test-pressure difference of 6.24 lbf/sq. ft. (300 Pa).

D. Thermal Movements: Locate expansion and contraction points to allow for free and noiseless thermal movements from surface temperature changes at a range of 20 deg F to 180 deg F (minus 29 to 82.2 deg C), material surfaces.

E. Fire Propagation Characteristics: MCM wall assembly passes NFPA 285 testing.

F. Rainscreen Cladding Performance:

1. AAMA 508: Water mist or water droplets appearing in less than 5% of the air/water barrier surface, and no continuous streaming at any location on the air/water barrier. Pressure equalization lag time between the cavity and cyclic wind pressure shall not exceed 0.08 sec^2. The maximum differential between the cavity and the cyclic wind pressure shall not exceed 50% of the maximum test pressure.

2. AAMA 509: Dynamic water penetration classification no greater than W1 or 1.0oz/ft^2 and air flow ventilation classification no less than V4 or 6.0 cfm/ft^2.

a.

A. MCM Wall Panel Systems: Provide -shop formed and assembled MCM panels formed into profiles for the installation method indicated and per the construction drawings. Include attachment assembly components**,** panel stiffeners, and accessories required.

1. Basis-of-Design Product: Subject to compliance with requirements, provide ALUCOBOND® PLUS manufactured by 3A Composites USA, Inc., or comparable product by:

    a. Arconic Architectural Products.
    b. Mitsubishi Chemical America.

B. Aluminum-Faced Composite Wall Panels: Formed with 0.020-inch- (0.50-mm-) thick aluminum sheet facings.

1. Panel Thickness: 4mm (0.157”)
2. Core: Fire retardant.
3. Exterior Finish: Acceptable coating resins are polyvinylidene difluoride (PVDF), fluorinated ethylene vinyl ether (FEVE), super-durable polyester (SDP), siliconized polyester (SMP) & anodized. The number of coats and film thicknesses shall comply with the specified warranty period and specified basis-of-design finish(es):

    a. Basis-of-design finish(es):

        1) Finish 1: CLEAR ANODIZED ALUMINUM
        2) Finish 2: CUSTOM COLOR PANTONE 2597 C

4. Peel Strength: 22.5 in-lb/in. (100 N x mm/mm) when tested for bond integrity in accordance with ASTM D1781.
5. Fire Performance: Flame spread less than 25 and smoke developed less than 450, in accordance with ASTM E84.

C. Attachment Assembly Components: Formed from extruded aluminum or other compatible material per the construction drawings and in compliance with all required performance testing.

MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Sub-framing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet ASTM A653/A653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A792/A792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide Fabricator's standard sections as required for support and alignment of MCM panel system.

B. Panel Accessories: Provide components required for a rainscreen panel system including trim and flashing as indicated on the constructions drawings. Match material and finish of MCM panels unless otherwise indicated.

C. Flashing and Trim: Provide flashing and trim formed from same material as MCM panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, end walls, framed openings, rakes, fasciae, and parapet caps.

1. Basis-of-Design Product: Subject to compliance with requirements, provide ALUCOBOND® AXCENT™ manufactured by 3A Composites USA Inc., or comparable product by one of the following:

    a. Arconic Architectural Products.
    b. Mitsubishi Chemical Composites.

2. Aluminum Trim: Formed with minimum 0.040-inch (1.00-mm-) thick, coil-coated aluminum sheet unless otherwise indicated on the construction drawings.

3. Basis-of-design Finish: To match MCM wall panel system unless otherwise indicated in the construction drawings.

1.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of MCM panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in MCM panels and remain weathertight; and as recommended in writing by MCM panel manufacturer.

FABRICATION

A. General: Fabricate and finish MCM panels and accessories to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and dimensions as indicated on the construction drawings.

B. Fabricate MCM panel joints to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and dimensions as indicated on the construction drawings.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations or recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces provided by others is acceptable. Variation in appearance from different production batches of finish effects including but not limited to anodized, brushed coil, mica flake, metallic flake, and texture is expected.

C. Allowable finishes for MCM Panels and Accessories: See basis-of-design finish selection and warranty requirements. Prepare, pretreat, and apply coatings to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Coil Coated Finishes:
   a. PVDF Fluoropolymer: AAMA 2605. Containing not less than 70 percent PVDF resin by weight in color coat.
   b. FEVE Fluoropolymer: AAMA 2605. F 100 percent fluorinated ethylene vinyl ether resin in color coat.
   c. SDP Super-durable Polyester: AAMA 2605. Containing carboxyl or hydroxyl functional resin in the color coat.
   d. SMP Siliconized Polyester: AAMA 2604. Containing silicone-modified, polyester-enamel in the color coat. .

2. Anodized Finish

   a. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
   b. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

EXECUTION

EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, MCM panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by MCM wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by MCM wall panel manufacturer.

   a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and assemblies penetrating MCM panels to verify actual locations of penetrations relative to seam locations of MCM panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

D. Miscellaneous Supports: Install sub framing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and MCM panel manufacturer's written recommendations.

MCM PANEL INSTALLATION

A. General: Install MCM panels in accordance with Fabricator's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor MCM panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving MCM panels.
2. Flash and seal MCM panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by MCM panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as MCM panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of MCM panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by MCM panel manufacturer.

D. Attachment Assembly, General: Install attachment assembly required to support MCM wall panels, including sub girts, perimeter flashing components, , and panel clips as indicated in the construction drawings.

E. Panel Installation: Attach MCM wall panels to supports at locations, spacings, and with fasteners to achieve performance requirements specified.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete MCM panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by MCM panel Fabricator; or, if not indicated, provide types recommended in writing by MCM system Fabricator.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, or SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (605 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

PROJECT CONDITIONS

A. Substrate Tolerances: The General Contractor is responsible for providing a substrate with a tolerance of 1/4 inch in 20.0 feet (6mm in 6m), on level, plumb, and location control lines as indicated and within 1/8 inch (3mm) offset adjoining faces of alignment of matching profiles.

B. Field Measurements: Verify locations of wall framing members and wall opening dimensions by field measurements prior to the fabrication of the MCM system. Field measurements to be acquired once all substrate materials and adjacent materials are installed to use as-built data to submit “As Built Shop Drawings” with required adjustments to panel dimensions and layouts.

FIELD QUALITY CONTROL

A. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

B. Prepare test and inspection reports.

CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as MCM panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of MCM panel installation, clean finished surfaces as recommended by MCM panel manufacturer. Maintain in a clean condition during construction.

B. After MCM panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace MCM panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SPECIFICATION SECTION

SECTION 075423 - THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING

SECTION INCLUDES

TPO roofing system including:

A. TPO Adhered membrane roofing system.

B. Cover board.

C. Roof insulation.

REFERENCES

A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
   1. ASTM D 1079 “Terminology Relating to Roofing and Waterproofing.”
   2. Glossary of NRCA's "The NRCA Roofing and Waterproofing Manual."
   3. Roof Consultants Institute “Glossary of Roofing Terms.”

B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

DESIGN CRITERIA

A. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

C. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

D. FMG Listing: Roofing membrane, base flashings, and component materials shall comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's “RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

SUBMITTALS

A. Submit under provisions of Section SUBMITTALS

B. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.

C. Detail Drawings
   1. Base flashings, cants, and membrane terminations.
   2. Tapered insulation, including slopes.
   3. Crickets, saddles, and tapered edge strips, including slopes.
   4. Insulation fastening patterns.

E. Verification Samples: Provide for each product specified.

F. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

G. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in “Performance Requirements" and “Guarantees” Article.

H. Qualification Data: For Installer and manufacturer.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

J. Maintenance Data.

K. Guarantees: Special guarantees specified in this Section.

QUALITY ASSURANCE

A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.

B. Manufacturer Qualifications: Qualified manufacturer that has [UL listing] [FMG approval] for roofing system identical to that used for this Project.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

D. Test Reports:
1. Roof drain and leader test or submit plumber's verification.
2. Core cut (if requested).
3. Roof deck fastener pullout test (if requested)

E. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system must be labeled by the single source roofing manufacturer issuing the guarantee.

F. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL[, FMG,] or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
1. Exterior Fire-Test Exposure: Class [A] ASTM E 108, for application and roof slopes indicated.
2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

WARRANTY

B. Provide manufacturer's system warranty equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
   1. Single-Source special guarantee includes roofing membrane, flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products and other single-source components of roofing system marketed by the manufacturer.
   2. Warranty Period: 20 years from date of Substantial Completion.
   3. Wind Rider: Warranty shall not exclude coverage for wind events up to 90 mph.
   4. Hail Rider: Guarantee shall have no exclusions for hail events up to 1 inch.

C. Installer's Warranty: Submit roofing Installer's warranty, including all components of roofing system for the following warranty period:
   1. Warranty Period: Five Years from date of Substantial Completion.

PRODUCTS

MANUFACTURER

A. Acceptable Manufacturers: Johns Manville, Firestone, Carlisle

B. Alternate manufacturers will be accepted. Provide submittal data for architect's review and approval. Requests for substitutions will be considered in accordance with provisions of SUBMITTAL Section

THERMOPLASTIC POLYOLEFIN ROOFING (TPO) MEMBRANE

A. Fabric-Reinforced Thermoplastic Polyolefin (TPO) Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced. Basis of Design: JM TPO or architect pre approved equal.

B. Thickness: 60 mils (1.52 mm), nominal.

C. Accelerated Weathering: Minimum of 24,000 hours without cracking or crazing as tested using ASTM G155.

D. Tensile Strength: Minimum of 300 lbf as tested using ASTM D751

E. Tearing Strength: Minimum of 85 lbs as tested using ASTM D751

AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.

C. Sheet Flashing: Manufacturer's unreinforced sheet flashing of same material as sheet membrane.

D. Bonding Adhesive: Manufacturer's standard solvent based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.

E. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

F. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.

G. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories.

WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer.

COVER BOARD

A. Gypsum Board: ASTM C1278, non-faced, gypsum and cellulose fiber substrate, 1/2 inch (13 mm) thick. Basis of Design: JM Securock Gypsum-Fiber Roof Board or architect pre approved equal.

ROOF INSULATION

A. General: Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II.
   1. Provide insulation package with R Value greater than 25.

TAPERED INSULATION

A. Tapered Insulation: ASTM C 1289, provide factory-tapered insulation boards fabricated to slope of 1/4” PER 12”, unless otherwise indicated.

INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer.

D. Urethane Adhesive: Manufacturer’s two component urethane adhesive formulated to adhere insulation to substrate.

EXECUTION

EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements affecting performance of roofing system:
   1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
   2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
   3. Verify that surface plane flatness and fastening of steel roof deck complies with roofing manufacturer tolerances.

PREPARATION

A. Clean and remover from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION-INSULATION

A. Coordinate installation of roof system components so insulation and cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install insulation boards with long joints in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with like material.

E. Install one or more layers of insulation under area of roofing to achieve required thickness. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

F. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

G. Preliminarily Fastened Insulation for Mechanically Fastened Systems: Install insulation with fasteners at rate required by roofing system manufacturer or applicable authority, which ever is more stringent.

H. Mechanically Fastened with Subsequent Layers Adhered Insulation: Secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type to deck type.
   1. Fasten first layer according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
   2. Fasten first layer to resist uplift pressure at corners, perimeter, and field of roof.
   3. Install subsequent layers in a two-part urethane adhesive according to roofing system manufacturer’s instruction.

I. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION - COVER BOARD

A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

C. Install cover board with long joints of cover board in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with cover board.
   1. Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.

D. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.
   1. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

E. Mechanically Fastened Cover Board: Install each layer of cover board and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof cover board to deck type.
   1. Fasten according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.

2. Fasten to resist uplift pressure at corners, perimeter, and field of roof.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION - ROOFING MEMBRANE

A. Install roofing membrane over area to receive roofing in accordance with membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

B. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical representative.

C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Bonding Adhesive: Apply solvent-based bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

E. Bonding Adhesive: Apply water-based bonding adhesive to substrate at rate required by manufacturer and immediately install roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

F. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

G. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

H. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
   1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
   2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
      a. Remove and repair any unsatisfactory sections before proceeding with Work.
   3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.

I. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

J. Install roofing membrane and auxiliary materials to tie in to existing roofing.

K. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION - FLASHING

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with sheet flashing.

D. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

E. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

F. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

G. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION - WALKWAY

A. Flexible Walkways: Install walkway products in locations indicated. Adhere with compatible adhesive and heat weld walkway products to substrate according to roofing system manufacturer's written instructions.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.

1. Notify Architect or Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

PROTECTION

A. Protect roofing system from damage and wear during remainder of construction period.

B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SPECIFICATION SECTION

SECTION 076200 - SHEET METAL FLASHING AND TRIM

This Section includes the following:

1. Formed low-slope roof flashing and trim.
2. Formed steep-slope roof flashing and trim.
3. Formed wall flashing and trim.

QUALITY ASSURANCE

Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

SHEET METALS

1. Pre-painted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.
2. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.

MISCELLANEOUS MATERIALS

1. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
2. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
3. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound.

REGLETS

1. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counter flashing pieces.

FABRICATION, GENERAL

2. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
3. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
4. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
5. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
6. Sealed Joints: Form non expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

7. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

8. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

9. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, non corrosive metal, and in thickness not less than that of metal being secured.

ROOF DRAINAGE SHEET METAL FABRICATIONS

1. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

    a. Accessories: Bronze wire ball downspout strainer.

    b. Gutter thickness is governed by girth and support spacing. See SMACNA's "Architectural Sheet Metal Manual" for minimum thicknesses and acceptable materials.

2. Fabricate from the following material:

    a. Prepainted, Metallic-Coated Steel: 0.0336 inch thick.

    b. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

    c. Manufactured Hanger Style: Gutter Brackets.

3. Fabricate downspouts from the following material:

    a. Prepainted, Metallic-Coated Steel: 0.0217 inch thick.

LOW-SLOPE ROOF SHEET METAL FABRICATIONS

Roof Edge Flashing, parapet wall caps, and Fascia Caps: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Furnish with 6-inch- wide joint cover plates.

Copings: Fabricate in minimum 96-inch- long, but not exceeding 10-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, seal, and solder or weld watertight.

Fabricate copings from the following material:

1. Prepainted, Metallic-Coated Steel: 0.0396 inch thick.

2. Base Flashing: Fabricate from the following material:

3. Prepainted, Metallic-Coated Steel: 0.0276 inch thick.

Counterflashing: Fabricate from the following material:

Prepainted, Metallic-Coated Steel: 0.0217 inch thick.

EXECUTION

INSTALLATION, GENERAL

General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

Torch cutting of sheet metal flashing and trim is not permitted.

Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.

Aluminum: Use aluminum or stainless-steel fasteners.

Copper: Use copper, hardware bronze, or stainless-steel fasteners.

Stainless Steel: Use stainless-steel fasteners.

Seal joints with elastomeric sealant as required for watertight construction.

Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches except where pretinned surface would show in finished Work.

Delete metals in two subparagraphs below that are not specified in Part 2.

Do not solder pre-painted, metallic-coated steel and aluminum sheet.

Pre-tinning is not required for lead-coated copper.

ROOF DRAINAGE SYSTEM INSTALLATION

General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps.

Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

ROOF FLASHING INSTALLATION

General: Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

WALL FLASHING INSTALLATION

General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

Reglets: Installation of reglets per manufacturers recommendations as located on architectural drawings.

Openings Flashing in Frame Construction: Install continuous head, sill, and similar flashings to extend 4 inches beyond wall openings.

END OF SECTION 076200

SECTION 077200 - ROOF HATCHES

SUMMARY

Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated single-wall curb frame with integral deck mounting flange and lid frame Counterflashing. Fabricate with welded or mechanically fastened and sealed corner joints. Provide continuous weathertight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.

Manufacturers:

1. Bilco Company (The).
2. O'Keeffe's Inc.
3. Precision Ladders, LLC.
4. Alternate manufacturers will be accepted, if all qualities are equal. Provide submittal data for architect's review and approval. Requests for substitutions will be considered in accordance with provisions of SUBMITTAL Section

Product:

The following requirements must be met for all roof hatches

1. Loads: Fabricate roof hatches to withstand 40-lbf/sq. ft. external and 20-lbf/sq. ft. internal loads.
2. Type and Size: Single-leaf lid, see design drawings for size.
3. Curb and Lid Material: Aluminum-zinc alloy-coated steel sheet, 0.079 inch thick.
4. Insulation: Cellulosic-fiber board.
5. Interior Lid Liner: Manufacturer's standard metal liner of same material and finish as outer metal lid.
6. Exterior Curb Liner: Manufacturer's standard metal liner of same material and finish as metal curb, MUST BE THERMALLY BROKEN.
7. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
8. Fabricate units to minimum height of 12 inches from finished roof surface, or as designated on the design drawings.
9. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate hatch curbs with height constant.
10. Galvanized steel hardware is standard; stainless steel may be available for corrosive environments. Verify availability with manufacturers.
11. Hardware: Stainless-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
12. Provide 2-point latch on covers larger than 84 inches.
13. Ladder Safety Post: Manufacturer's standard ladder safety post. Post to lock in place on full extension. Provide release mechanism to return post to closed position.
14. Safety Railing System: Manufacturer's standard complete system including rails, clamps, fasteners, safety barrier at railing opening, and all accessories required for a complete installation.

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

SUMMARY

Exterior and interior joints in vertical surfaces and horizontal nontraffic surfaces.
See Civil Documents for sealing joints in pavements, walkways, and curbing.
See Division 08 Section "Glazing" for glazing sealants.

PRODUCTS

Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application.

Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

Sealants: 250 g/L.
Sealant Primers for Nonporous Substrates: 250 g/L.
Sealant Primers for Porous Substrates: 775 g/L.

Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

ELASTOMERIC JOINT SEALANTS

Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

Multicomponent Nonsag Urethane Sealant:

Tremco; Dymeric.
Type and Grade: M (multicomponent) and NS (nonsag).
Class: 25.
Additional Movement Capability: 40 percent movement in extension and 25 percent in compression for a total of 65 percent movement.
Exposure: NT (nontraffic).
Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

Single-Component Nonsag Urethane Sealant:
Sika Corporation, Inc.; Sikaflex - 1a.
Sonneborn, Division of ChemRex Inc.; Ultra.
Sonneborn, Division of ChemRex Inc.; NP 1.
Tremco; Vulkem 116.
Type and Grade: S (single component) and NS (nonsag).
Class: 25.
Exposure: T (traffic) and NT (nontraffic).
Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

Single-Component Neutral-Curing Silicone Sealant:
Dow Corning Corporation; 799.
GE Silicones; UltraGlaze SSG4000.
GE Silicones; UltraGlaze SSG4000AC.
Polymeric Systems Inc.; PSI-631.
Schnee-Morehead, Inc.; SM5731 Poly-Glaze Plus.
Tremco; Proglaze SG.
Tremco; Spectrem 2.
Tremco; Tremsil 600.

Type and Grade: S (single component) and NS (nonsag).
Class: 25.
Exposure: NT (nontraffic).
Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

LATEX JOINT SEALANTS

Latex Sealant: Comply with ASTM C 834, Type O P, Grade NF.

Bostik Findley; Chem-Calk 600.
Pecora Corporation; AC-20+.
Schnee-Morehead, Inc.; SM 8200.
Sonneborn, Division of ChemRex Inc.; Sonolac.
Tremco; Tremflex 834.

ACOUSTICAL JOINT SEALANTS

Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
United States Gypsum Co.; SHEETROCK Acoustical Sealant.
Polytite Manufacturing Corporation; Polytite B.

MISCELLANEOUS MATERIALS

Primer & Cleaners for Nonporous Surfaces: As recommended by joint-sealant manufacturer where required.
Joint Sealant Backing: As recommended by joint-sealant manufacturer.

EXECUTION

Clean out joints immediately before installing joint sealants.
Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

INSTALLATION

Comply with recommendations in ASTM C 1193 and ASTM C 919 for use of joint sealants as applicable to materials, applications, and conditions indicated.
Install sealant backings to support sealants during application and at position required to produce optimum sealant movement capability.
Install bond-breaker tape where sealant backings are not used between sealants and backs of joints.

JOINT-SEALANT SCHEDULE

- Exterior vertical and horizontal nontraffic joints between precast architectural concrete units. - Single-component nonsag urethane sealant
- Exterior vertical control and expansion joints in unit masonry. - Single-component nonsag urethane
- Exterior joints in exterior insulation and finish systems. - Single-component neutral- and basic-curing silicone
- Exterior joints in vertical and horizontal nontraffic surfaces. - Single-component nonsag urethane sealant
- Vertical control and expansion joints on exposed interior surfaces of exterior walls. - Latex sealant.
- Interior perimeter joints of exterior openings. - Latex sealant.
- Interior joints between plumbing fixtures and adjoining walls, floors, and counters. - Single-component mildew-resistant neutral-curing silicone sealant. White
- Vertical joints on exposed surfaces of interior unit masonry and concrete walls and partitions. - Single-component nonsag urethane sealant
- Perimeter joints between interior wall surfaces and frames of interior doors,windows, and elevator entrances. - Latex sealant.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

Section Includes:

Steel doors and steel frames along with Steel frame components for stick assemblies

Furnish factory primed steel door frames for interior and exterior doors. Refer to architectural drawings, schedules, and details for required types and sizes of frames.

QUALITY ASSURANCE

A. Acoustical Doors shall have a minimum Sound Transmission Classification (STC) Rating of 38 and be tested in accordance with ASTM E-90-87, "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements".

B. Insulated Doors shall have:
   1. A "U Factor" of 0.10 for a Polyurethane core.
   2. A "U Factor" of 0.13 for a Polystyrene core.

C. Fire Rated Doors:
   1. Doors shall be tested in accordance with UL 10B, "Fire Tests of Door Assemblies", NFPA 252, "Fire Tests of Door Assemblies", and UL 10C, "Positive Pressure Fire Tests of Door Assemblies".
   2. Doors must have an approved marking or physical label, applied by an authorized facility, in accordance with the procedure set forth by an independent certification agency.

D. Stairwell Doors shall have a 250¼ F. temperature rise rating, and the label on the door shall indicate the specific hourly fire rating.

MANUFACTURER

A. Mesker Hollow Metal
B. Republic Doors and Frames
C. Architect approved equivalent, provide manufacturer’s information for review and approval

DOORS AND FRAMES

A. Doors: Full flush (No Vertical Face Seams), complying with ANSI A250.8; face panels laminated to core and complete unit closed with steel perimeter channels projection welded to face sheets.
   1. Thickness: 1-3/4 inches (44 mm).
      a. ANSI Level 2, Model 1; 18 gage (1.0 mm) faces, visible edge seams.
   2. Faces: Full flush, Narrow Lite, Full Glass, Half Glass .
   3. Insulated Doors: Insulated; U-value of 0.13, polystyrene core.
   4. Core: Doors fabricated by laminating panels to a specified core and the complete unit closed with steel perimeter channels, projection welded to the face sheets. Core shall be as follows:
      a. 3/4 inch (19 mm) cell honeycomb core.
      b. Expanded polystyrene core.
   5. Steel Stiffened Doors: Steel reinforced with minimum 22 gage (0.75 mm) hat shaped stiffeners welded to the inside of each face sheet at maximum of 6 inches (150 mm) on center, with mineral wool filling spaces between stiffeners.
   6. Finish: Factory prime finish.

B. Door Reinforcements:
   1. Top and Bottom Channels: 16 gage steel, projection welded to both face sheets at a maximum of 2-1/2 inched (64 mm) on center.
   2. Lock Reinforcing Channel: Continuous 16 gage channel, with tapped holes extruded to 14 gage. Channel shall be welded to both face sheets at a maximum of 5 inches (127 mm) on center.
   3. Closer Reinforcement: 12 gage box type reinforcement, 18 inches (457 mm) long.

C. Fire Rated Doors: Ratings as indicated on Door Schedule, when tested in accordance with NFPA 252 or UL 10B.
   1. Labeled by UL, WH, or other agency acceptable to the authorities having jurisdiction.
   2. Stairwell Doors: 250 degrees F (139 degrees C) temperature rise rating as well as the required fire rating.

D. Acoustical Doors: Sound Transmission Classification (STC) Rating of 38 when tested according to ASTM E 90.

FRAMES CONSTRUCTION

A. Frames: Formed steel sheet, with 2 inch (50 mm) wide face jambs and heads unless otherwise indicated; complying with ANSI A250.8.
   1. Frame Depth: Fixed, as indicated on drawings.
   2. ANSI Level 1 Doors: 16 gage (1.5 mm) frames.
   3. Corners: Mitered; face welded and ground smooth.
   4. Provide 3 silencers for single doors, 2 silencers on head of frame for pairs of doors.
   5. Finish: Factory prime finish.

B. Frame Anchors: Minimum of six wall anchors and two base anchors.

STICK ASSEMBLIES

A. Architectural Stick Assemblies: Standard profile frame material, notched or mitered to coordinate with adjoining frame members and forming square corners.
   1. Thickness: 16 gage (1.3 mm).
   2. Reinforce or prepare to receive required hardware.
   3. Glazing Bead: Pre-punched, cut to proper length and shipped loose for field installation.
   4. Perform all fabrication in shop or plant; field joints permitted only when size of total assembly exceeds shipping limitations.
   5. Exterior Wind Load-Bearing Assemblies: Vertical load-bearing members fabricated without splices.

FACTORY FINISH

A. All doors, frames, and stick components shall be cleaned and finished in accordance with ANSI A250.10, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames".

B. Preparation: Clean and phosphatize surfaces of steel doors and frames".

C. Primer: Apply one coat of a gray, alkyd acrylic enamel primer, forced cured.

EXAMINATION

A. Before beginning installation, verify that substrate conditions previously installed under other sections are acceptable for installation of doors and frames in accordance with manufacturer's installation instructions and technical bulletins.

B. Verify door frame openings are installed plumb, true, and level.

INSTALLATION

A. Install frames plumb, level, rigid and in true alignment in accordance with ANSI A250.11, "Recommended Erection Instructions for Steel Frames" and ANSI A115.IG, "Installation Guide for Doors and Hardware".

B. All frames other than slip-on types shall be fastened to the adjacent structure to retain their position and stability. Drywall slip-on frames shall be installed in prepared wall openings, and shall use pressure type and sill anchors to maintain stability.

C. Where grouting is required in masonry installations, frames shall be braced or fastened to prevent the pressure of the grout from deforming the frame members. Grout shall be mixed to provide a 4 inch (102 mm) maximum slump and hand troweled into place. Grout mixed to a thin "pumpable" consistency shall not be used.

D. Install fire-rated doors and frames in accordance with NFPA 80 and local code authority requirements.

E. Install doors to maintain alignment with frames to achieve maximum operational effectiveness and appearance. Adjust to maintain perimeter clearances as required. Shim as needed to assure the proper clearances are achieved.

F. Install hardware as specified in Section 087100 in accordance with the hardware manufacturer's recommendations and templates. ANSI A115.IG, "Installation Guide for Doors and Hardware" shall be consulted for other pertinent information.

CLEARANCES

A. Clearance between the door and frame head and jambs for both single swing and pairs of doors shall be 1/8 inch (3.2 mm).

B. Clearance between the meeting edges of pairs of doors shall be 3/16 inch plus or minus 1/16 inch (5 mm plus or minus 1.6 mm). For fire rated applications, the clearance between the meeting edges of pairs of doors shall be 1/8 inch plus or minus 1/16 inch (3.2 mm plus or minus 1.6 mm).

C. Bottom clearance shall be 3/4 inch (19 mm).

D. The clearance between the face of the door and door stop shall be 1/16 inch to 1/8 inch (1.6 mm plus or minus 3.2 mm)..

E. All clearances shall be, unless otherwise specified, subject to a tolerance of plus or minus 1/32 inch (.4 mm).

ADJUSTING AND CLEANING

A. Adjust doors for free swing without binding.

B. Adjust hinge sets, locksets, and other hardware. Lubricate using a suitable lubricant compatible with door and frame coatings.

C. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions before owner's acceptance.

PROTECTION

A. Protect installed products and finished surfaces from damage during construction.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1..1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1..2 SUMMARY:

A. Extent and location of each type of flush wood door is indicated on drawings and in schedules.

B. Types of doors required include the following:
1. Solid core 5 ply architectural grade flush wood doors with solid veneer faces, see finish schedule for door veneer selections.

C. Wood door frames and other woodwork in juxtaposition to flush wood doors are specified in Division-6 section "Architectural Woodwork".

1..3 SUBMITTALS:

A. Product Data: Door manufacturer's technical data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.

B. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for factory finishing and other pertinent data.
1. For factory-premachined doors, indicate dimensions and locations of cutouts for locksets and other cutouts adjacent to light and louver openings.

1..4 QUALITY ASSURANCE:

A. Quality Standards: Comply with the following standards:
1. NWWDA Quality Standard: I.S.1 "Industry Standard for Wood Flush Doors", of National Wood Window and Door Association (NWWDA).
2. AWI Quality Standard: "Architectural Woodwork Quality Standards"; including Section 1300 "Architectural Flush Doors", of Architectural Woodwork Institute (AWI) for grade of door, core construction, finish and other requirements exceeding those of NWWDA quality standard.

B. NWWMA Quality Marking: Mark each wood door with NWWDA Wood Flush Door Certification Hallmark certifying compliance with applicable requirements of NWWDA I.S. 1 Series.
1. For manufacturers not participating in NWWDA Hallmark Program, a certification of compliance may be substituted for marking of individual doors.

C. Fire-Rated Wood Doors: Provide wood doors which are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152 and which are labeled and listed for ratings indicated by UL, Warnock Hersey or other testing and inspection agency acceptable to authorities having jurisdiction.
1. Oversize Fire-Rated Wood Doors: For door assemblies exceeding sizes of tested assemblies, provide manufacturer's certificate stating that doors conform to all standard construction requirements of tested and labeled fire door assemblies except as to size.

D. Manufacturer: Obtain doors from a single manufacturer.

1..5 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration.

Comply with requirements of referenced standards and recommendations of NWWDA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as well as with manufacturer's instructions.

B. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

1..6 PROJECT CONDITIONS:

A. Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the following requirements applicable to project's geographical location:
1. Referenced AWI quality standard including Section 100-S-3 "Moisture Content".

1..7 WARRANTY:

A. General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

B. Door Manufacturer's Warranty: Submit written agreement in door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup or twist) or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced quality standards.
1. Warranty shall also include reinstallation which may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
2. Warranty shall be in effect during following period of time after date of Substantial Completion.
3. Solid Core Interior Doors:
a. Life of installation.

C. Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

PART 2 - PRODUCTS

2..1 MANUFACTURERS:

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following (All others must be approved prior to bid) :
1. Solid Core Doors with Wood Veneer Faces:
a. Algoma Hardwoods, Inc.
b. Oshkosh Architectural Door Company

2..2 INTERIOR FLUSH WOOD DOORS:

A. Solid Core Doors for Transparent Finish: Comply with the following requirements:
1. Faces: See plans for veneer and stain designation.
2. AWI Grade: Premium.
3. Construction: 5 Ply Architectural Grade Doors

B. Faces and AWI Grade: Provide faces and grade to match non-rated doors in same area of building, unless otherwise indicated.
1. Construction: Manufacturer's standard core construction as required to provide fire-resistance rating indicated.
2. Edge Construction: Provide manufacturer's standard laminated edge construction for improved screw-holding capability and split resistance as compared to edges composed of a single layer of treated lumber.

2..3 FACTORY FINISHING:

A. General: Comply with referenced AWI quality standard including Section 1500 "Factory Finishing".

B. Prefinish wood doors at factory.

PART 3 - EXECUTION

3..1 EXAMINATION:

A. Examine installed door frames prior to hanging door:
1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
2. Reject doors with defects.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3..2 INSTALLATION:

A. Hardware: For installation see Division-8 "Finish Hardware" section of these specifications.

B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.

C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
1. Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4" clearance from bottom of door to top of threshold.
2. Bevel non-rated doors 1/8" in 2" at lock and hinge edges.

D. Prefit Doors: Fit to frames for uniform clearance at each edge.

E. Factory-Finished Doors: Restore finish before installation, if fitting or machining is required at the job site.

3..3 ADJUSTING AND PROTECTION:

A. Operation: Rehang or replace doors which do not swing or operate freely.

B. Finished Doors: Refinish or replace doors damaged during installation.

C. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 082110

SECTION 084113 - ALUMINUM FRAMED STOREFRONTS - THERMAL

SUMMARY

Section Includes: Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.

PERFORMANCE REQUIREMENTS

1. General Performance: Aluminum-framed storefront system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
2. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.

Basic Wind Speed (MPH): 115 MPH
Importance Factor (I, II, III): 1.15
Exposure Category (A, B, C, D): C

Storefront System Performance Requirements:

3. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft^2 (0.3 l/s · m^2) at a static air pressure differential of 6.24 psf (300 Pa).
4. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501
5. Uniform Load: A static air design load of 20 psf (958 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

SUBMITTALS

1. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum frame storefront system indicated.
2. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
3. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
4. Samples for Verification: For aluminum framed storefront system and components required.
5. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, of aluminum framed storefront.
6. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12” (300 mm) lengths of full-size components and showing details of the following:
7. Joinery, including concealed welds.
8. Anchorage.
9. Expansion provisions.
10. Glazing.
11. Flashing and drainage.
12. Other Action Submittals:
13. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

QUALITY ASSURANCE

1. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
2. Manufacturer Qualifications: A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

3. Source Limitations: Obtain aluminum framed storefront system through one source from a single manufacturer.
4. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
5. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
6. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
7. Build mockup for type(s) of storefront elevation(s) indicated, in location(s) shown on Drawings.
8. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
9. Structural-Sealant Glazing: Comply with ASTM C 1401, "Guide for Structural Sealant Glazing" for design and installation of structural-sealant-glazed systems.
10. Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.

PROJECT CONDITIONS
Field Measurements: Verify actual dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

WARRANTY
1. Manufactures Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty.
2. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PRODUCTS

MANUFACTURERS

1. Kawneer Company Inc. Trifab® 451 (Thermally Broken) 2” x 4” (44.5 mm x 101.6 mm) Glass: Center Plane. Screw Spline.
2. U.S. Aluminum.
3. Oldcastle.
4. Tubelite
5. Alternates will be considered based on full submittal provided for architect’s review and approval.

Subject to compliance with requirements, provide a comparable product by the following:
1. Substitutions: Refer to Substitutions Section for procedures and submission requirements
2. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum storefront for a period of not less than ten (10) years. (Company Name)
3. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
4. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.
5. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

MATERIALS

1. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070” wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
2. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
3. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
4. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with

ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
5. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
6. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

STOREFRONT FRAMING SYSTEM

1. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
2. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.
3. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action
4. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
5. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

GLAZING SYSTEMS

1. Glazing: As specified in Division 08 Section "Glazing."
2. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
3. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
4. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
5. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
6. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.

ACCESSORY MATERIALS

1. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants."
2. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

FABRICATION

1. Extrude aluminum shapes before finishing.
2. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
3. Profiles that are sharp, straight, and free of defects or deformations.
4. Accurately fit joints; make joints flush, hairline and weatherproof.
5. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
6. Physical and thermal isolation of glazing from framing members.
7. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
8. Provisions for field replacement of glazing.
9. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
10. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
11. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
12. Storefront Framing: Fabricate components for assembly using manufactures standard installation instructions.
13. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

ALUMINUM FINISHES

See architectural drawings, window schedule and storefront general notes for finish designation. Follow below for finish specification and finish class.

A. All aluminum finishes labelled “CLEAR ANODIZED” shall be Anodized Aluminum AA-M12C22A41, Architectural Class I (.7MIL).
B. All aluminum finished labelled “BRONZE ANODIZED” shall be Anodized Aluminum AA-M10C21A44, Architectural Class 1 (.7MIL).

EXECUTION

EXAMINATION

1. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight aluminum framed storefront installation.
2. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
3. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
4. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
5. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

1. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum framed storefront system, accessories, and other components.
2. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
3. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
4. Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding door to the exterior.
5. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

FIELD QUALITY CONTROL

1. Field Tests: Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
2. Testing: Testing shall be performed by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements. Testing Standard per AAMA 503, including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 Water Infiltration Test.
3. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft^2, whichever is greater.
4. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 6.24 psf (300 Pa).
5. Manufacturer's Field Services: Upon Owner’s written request, provide periodic site visit by manufacturer’s field service representative.

ADJUSTING, CLEANING, AND PROTECTION

1. Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
2. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
3. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 084113

SECTION 083302 - ROLLING FIRE DOOR

GENERAL
WORK INCLUDES
A. Section covers manual, automatic closing, overhead rolling fire doors.

RELATED SECTIONS
A. Metal Fabrications
B. Painting, Field Painting
C. Products required, but not covered under this spec section:
1. Control Station
2. Smoke/Heat Detectors
3. Annuciator Devices

REFERENCES
A. ASTM B 653/653M
B. ASTM B 209/209M
C. ASTM B 221/221M
D. AAMA 2604
E. DASMA TDS-163
F. ANSI/DASMA 102

SUBMITTALS
D. Product Data.
1. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
2. Quality Assurance/Control Submittals:
a. Provide proof of manufacturer ISO 9001:2000 registration.
b. Provide proof of manufacturer and installer qualifications - see 1.4 below.
c. Provide manufacturer's installation instructions.
3. Closeout Submittals:
a. Operation and Maintenance Manual.
b. Certificate stating that installed materials comply with this specification.

QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum ten years of documented experience.
B. Installer Qualifications: Minimum five years of documented experience, and authorized by the door manufacturer.

WARRANTY

A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

B. Maintenance: Submit for owner’s consideration and acceptance of a maintenance service agreement for installed products.

DELIVERY STORAGE AND HANDLING

A. Follow manufacturer's instructions.

PRODUCTS

MANUFACTURERS

A. Acceptable Manufacturer: Clopay Corporation: 8585 Duke Blvd.; Mason, OH 45040; https://www.clopaydoor.com
B. Substitutions permitted, provide full submittal for architect's review and approval.

PRODUCT

A. Clopay Model ERD10

MATERIALS

A. Curtain:
   2. GalvaNex™ Coating System and phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.
B. Bottom Bar Finish:
   1. Steel: Phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

C. Guides: Fabricate with minimum 3/16 inch stainless steel angles. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.

   1. Finish: Stainless steel:Mill finish

D. Counterbalance Shaft Assembly:
   1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.
   2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

E. Brackets: Fabricate from minimum 1/4 inch (6.35 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.

F. Finish:Phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

G. Hood: [24 gauge galvanized steel] [24 gauge stainless steel] with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
   1. Finish:GalvaNex™ Coating System and phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

OPERATION

A. Manual Push-Up with Conventional Spring Release System: Provide lift handles on bottom bar and pole with hook.
Automatic closure shall be activated by fusible link or a local smoke/fire detector by means of a fail-safe releasing device.
Doors shall maintain an average closing speed of not less than 6" (152 mm) nor more than 24" (610 mm) per second during automatic closing per NFPA 80.
Resetting of spring tension and mechanical dropouts by a trained door systems technician is required.

   1. Fusible Link with FireGard BB Release Device – Manual Push-Up Operation:

a. Activation: [Central alarm system] [Local smoke and heat detectors] or power outage in excess of 72 hours or melting of fusible link.
b. Average Closing Speed: Not less than 6 inches (152 mm) nor more than 24 inches (610 mm) per second.
c. Reset Procedure: Reset spring tension and mechanical dropouts; reset FireGard BB or replace fusible link.

EXECUTION

EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Commencement of work by installer is acceptance of substrate.

INSTALLATION

A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.

B. Comply with NFPA 80 and follow manufacturer's installation instructions.

ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

FIELD QUALITY CONTROL

A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.

B. Remove surplus materials and debris from the site.

DEMONSTRATION

A. Demonstrate proper operation, testing and reset procedures to Owner's Representative.

B. Instruct Owner's Representative in maintenance procedures.

END OF SPECIFICATION SECTION

SECTION 087100 - FINISH HARDWARE

PART 1 - GENERAL

1..1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1..2 DESCRIPTION OF WORK:

A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Extent of finish hardware required is indicated on drawings and in schedules.

C. Types of finish hardware required include the following:

1. Hinges
2. Lock cylinders and keys
3. Lock and latch sets
4. Exit devices
5. Push/pull units
6. Closers
7. Protection plates

D. Silencers included integral with hollow metal frames specified with door frames elsewhere in Division 8.

1..3 QUALITY ASSURANCE:

A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor.

1..4 SUBMITTALS:

A. Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finishes.

B. Hardware Schedule: Submit final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware

schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

a. Type, style, function, size and finish of each hardware item.
b. Name and manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
e. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
f. Mounting locations for hardware.
g. Door and frame sizes and materials.
h. Keying information.

2. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.
3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

C. Samples: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finished as required, and tagged with full description for coordination with schedule.

1. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.

D. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

1..5 PRODUCT HANDLING:

A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Packaging of hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packaged in same container.

C. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

D. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

E. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 - PRODUCTS

2..1 HARDWARE ALLOWANCE:

A. Selection and Ordering: Furnish finish hardware as selected by Architect and in such amounts as provided for under Allowances in Division 1 and other general provisions of the Contract.

B. Responsibilities of Finish Hardware Supplier:

1. Submittals: Provide through Contractor required Product Data, Final Hardware Schedule, Separate Keying Schedule (if required), and samples as specified in Part 1 - General of this section, unless otherwise indicated.
2. Construction Schedule: Inform Contractor at earliest possible date of estimated times and dates to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing Finish Hardware for purposes of including in construction progress schedule and then comply with this schedule.
3. Coordination and Templates: Assist Contractor as required to coordinate hardware with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.
4. Product Handling: Package, identify, deliver, and inventory hardware as specified in Part 1 - General of this section.
5. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of hardware selection, furnish proper types, finishes, and quantities of finish hardware, including fasteners, and Owner's maintenance tools; and furnish or replace any items of finish hardware resulting from shortages and incorrect items, at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

C. Responsibilities of Contractor:
1. Submittals: Coordinate and process submittals for Finish Hardware in same manner as submittals for other work.
2. Construction Schedule: Cooperate with Finish Hardware supplier in establishing scheduled dates for submittals and delivery of templates and finish hardware.
3. Coordination: Coordinate finish hardware with other work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier.
4. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials. Any hardware items lost, damaged or stolen after being accepted by Contractor shall be replaced at Contractor's expense.
5. Installation Information: The general types and approximate quantities of hardware required for this project are indicated at the end of this section in order to establish Contractor's costs for installation and other work not included in allowances.

    a. No adjustments in Contract sum will be made for costs other than those covered by the allowances for subsequent increases or decreases in quantity of one or more hardware types which do not exceed 5 percent.

2..2 SCHEDULED HARDWARE:

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following:
1. Manufacturer's Product Designations: One or more manufacturers are listed for each hardware type required. An asterisk (*) after a manufacturer's name indicates whose product designation is used in the Hardware Schedule for purposes of establishing minimum requirements. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of the other manufacturers which comply with requirements including those specified elsewhere in this section.
2. ANSI/BHMA designations used elsewhere in this section or in schedules to describe hardware items or to define quality or function are derived from the following standards. Provide products complying with these standards and requirements specified elsewhere in this section.
    a. Butts and Hinges: ANSI A156.1 (BHMA 101)
    b. Locks and Lock Trim: ANSI A156.2 (BHMA 601)
    c. Exit Devices: ANSI A156.3 (BHMA 701)
    d. Door Controls - Closers: ANSI A156.4 (BHMA 301)
    e. Template Hinge Dimensions: ANSI A156.7
    f. Locks & Latches: ANSI A156.13 (BHMA 621)

2..3 MATERIALS AND FABRICATION:

A. General:
1. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.
   a. Manufacturer's identification will be permitted on rim of lock cylinders only.
   b. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
3. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
4. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
5. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
6. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2..4 HINGES, BUTTS AND PIVOTS:

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template- produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
1. Non-ferrous Hinges: Stainless steel pins.
2. Exterior Doors: Non-removable pins.
3. Out-swing Corridor Doors: Non-removable pins.
4. Interior Doors: Non-rising pins.
5. Tips: Flat button and matching plug, finished to match leaves.
6. Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

2..5 LOCK CYLINDERS AND KEYING:

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Existing System: Grandmasterkey the locks to the Owner's existing system, with a new masterkey for the project.

C. Equip locks with manufacturer's standard 6-pin tumbler cylinders.

D. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

E. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
   1. Permanently inscribe each key with number or lock that identifies cylinder manufacturer key symbol, and notation "DO NOT DUPLICATE".

F. Key Material: Provide keys of nickel silver only.

G. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.
   1. Furnish one extra blank for each lock.
   2. Deliver keys to Owner's representative.

2..6 LOCKS, LATCHES AND BOLTS:

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
   1. Provide standard (open) strike plates for interior doors of residential units where wood door frames are used.
   2. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
   3. Provide roller type strikes where recommended by manufacturer of the latch and lock units.

B. Lock Throw: Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
   1. Provide 1/2" minimum throw on other latch and deadlock bolts.

C. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.

D. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to hold the push bar down and the latch bolt in open position.

2..7 PUSH/PULL UNITS:

A. Exposed Fasteners: Provide manufacturer's standard exposed fasteners for installation; through-bolted for matched pairs, but not for single units.

2..8 CLOSERS AND DOOR CONTROL DEVICES:

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.

B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.

C. Provide black resilient parts for exposed bumpers.

2..9 DOOR TRIM UNITS:

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screw.

B. Fabricate edge trim of stainless steel, not more than 1/2" nor less than 1/16" smaller in length than

door dimension.

C. Fabricate protection plates (armor, kick or mop) not more than 1- 1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated.
   1. Metal Plates: Stainless steel, .050" (U.S. 18 ga.).

2..10 HARDWARE FINISHES:

A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.

B. Provide finishes which match those established by BHMA or, if none established, match the Architect's sample.

C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer".

E. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials & Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

F. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.
   1. Rust-Resistant Finish: For iron and steel base metal, required for exterior work and in areas shown as "High Humidity" areas (and also when designed with the suffix -RR), provide 0.2 mil thick copper coating on base metal before applying brass, bronze, nickel or chromium plated finishes.

PART 3 - EXECUTION

3..1 INSTALLATION:

A. Mount Hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.

B. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.

C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3..2 ADJUST AND CLEAN:

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

See Specific Hardware requirements on Door Schedule sheet within drawings.

END OF SECTION 087100

SECTION 088000 - GLAZING

SUMMARY

This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Windows.
2. Doors.
3. Glazed Storefronts
4. Interior Borrowed Lights

PERFORMANCE REQUIREMENTS

1. Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
2. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
3. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
4. Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in miles per hour at 33 feet above grade, according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
    A. Basic Wind Speed 90 MPH
    B. Importance Factor 1.15
    C. Exposure Category C
    D. Internal Pressure Coefficient 0.18
5. Probability of breakage for vertical glazing 8 lites per 1000 for lites set vertically, or not more than 15 degrees off vertical and under wind load. Load duration 3 seconds.
6. Min glass thickness for exterior lites, not less than 1/4”
7. Thickness of tinted glass. Provide the same thickness for each tint color indicated throughout the project.
8. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
9. Temperature Change Range -60 deg F, ambient 180 deg F, material surfaces.
10. Thermal and optical performance properties. Provide glass with performance properties specified based on manufacturer’s published data, as determined according to procedures indicated below:
11. For monolithic lass lites, properties are based off lites min 1/8” thick.
12. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite 6.0 mm thick and a nominal 1/2” wide interspace.
13. Center of glass values:
14. U-Factor: ***See drawings for U Factor designations.*
15. Shading Coefficient: ***See drawings for Shading Coefficient designations.*
16. Solar Heat Gain Coefficient: ***See drawings for Solar Heat Gain designations.*

SUBMITTALS

1. Product Data: For each glass product and glazing material indicated.
2. Samples: 12” SQ for each type of glass product indicated, other than monolithic clear float glass.
3. Use same glazing schedule as indicated on drawings.
4. Provide adhesion data from glazing sealant manufacturer.

QUALITY ASSURANCE

1. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
2. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council.

WARRANTY

1. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form, made out to Owner and signed by coated-glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
2. Warranty period: 10 years from date of substantial completion.
3. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
4. Warranty period: 10 years from date of substantial completion.
5. All other project glazing 10 year warranty on glazing.

MANUFACTURERS

1. Vitro Glass
2. Oldcastle
3. Or approved equal, substitutions allowed.

GLASS PRODUCTS.

1. Annealed float glass: ASTM C 1036, Type 1 (transparent flat glass), Quality Q3.
2. Ultra Clear (low Iron) Float Glass. Class 1 Clear.
3. Thickness 1/4”
4. Heat Treated Float Glass. ASTM C 1048, Type 1 (transparent flat glass), Quality Q3.
5. Provide FT fully tempered float glass in place of annealed heat strengthened float glass where safety glass is required.
6. Wired glass. None to be used on project. Use fully tempered FT glazing in lieu of wired glass. All fire glass to be non-wired ceramic glazing.
7. Insulated glass units. Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article
8. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article
9. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
10. Sealing System: Dual seal.
11. Spacer Specifications: Manufacturer's standard spacer material and construction
12. Passive Solar Low-E Insulated Glass Units
13. Vitro Glass Solarban 60 OR approved equivalent, must meet Vitro Glass Solarban 60 Solar Heat Gain Coefficent.
14. Overall Unit Thickness to be 1”, each lite 1/4” thick with 1/2” air gap.
15. Outdoor Unit
    A. Class 1 Spectrally Selective Tint Glass
    B. Vitro Glass “Solarban60” see design drawings for color designations.
12. Indoor Unit
    A. Class 1 Low E-Glass

FIRE RATED GLAZING

2. Fire protection rating. As indicated for the assembly in which the glazing material is installed and permanently labelled by a testing and inspecting agency acceptable to the authority having jurisdiction.

3. Film-Faced Ceramic Glazing Material: Proprietary Category II safety glazing product in the form of a 3/16” thick, ceramic glazing material polished on both surfaces faced on one surface with a clear glazing film, and as follows:
4. Product: "FireLite NT" by Nippon Electric Glass Co., Ltd., and distributed by Technical Glass Products.

EXECUTION

1. General: Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
2. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
3. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
4. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
5. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
6. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
7. Provide spacers for glass lites where length plus width is larger than 50 inches.
8. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
9. Tape Glazing: Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
10. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
11. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
12. Apply heel bead of elastomeric sealant.
13. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
14. Gasket Glazing (Dry): Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
15. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
16. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
17. Install gaskets so they protrude past face of glazing stops.

PROTECTION

1. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.
2. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION 088000

SECTION 092900 - GYPSUM BOARD

QUALITY ASSURANCE

Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

INTERIOR GYPSUM BOARD

General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. American Gypsum Co.
2. BPB America Inc.
3. G-P Gypsum offers two different product lines, one that is paper faced on both sides ("ToughRock") and one that incorporates patented embedded glass mats on concealed surfaces ("DensArmor"). If products with embedded glass mats are required, revise the Section Text accordingly.
4. G-P Gypsum.
5. Lafarge North America Inc.
6. National Gypsum Company.
7. PABCO Gypsum.
8. Temple.
9. USG Corporation.

Type X:

Thickness: 5/8 inch.

Long Edges: Tapered and featured (rounded or beveled) for pre filling.

Special fire-Type X gypsum board has fire-resistive capability greater than that of standard Type X. For rated assemblies, panels from different manufacturers cannot be intermixed because ratings apply only to assemblies identical in materials and construction to those tested. Design designations of independent testing agencies indicated on Drawings generally determine product requirements for special Type X gypsum board.

Abuse-Resistant Type: Manufactured to produce greater resistance to surface indentation and through-penetration (impact resistance) than standard, regular-type and Type X gypsum board.

Core: 5/8 inch, Type X.

EXTERIOR GYP SHEATHING

Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M.

"Dens-Glass Gold" by G-P Gypsum.

Long Edges: Tapered.

If required, insert other types of gypsum board here.

TILE BACKING PANELS

Water-resistant gypsum backing board can be painted to produce a continuous wall surface adjacent to tile. To avoid sagging, do not use it on ceilings. See "Tile Backing Panels" Article in the Evaluations.

Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M or ASTM C 1396/C 1396M.

Core: 5/8 inch, Type X.

TRIM ACCESSORIES

Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.

1. Shapes:
2. Cornerbead.
3. Bullnose bead.
4. LC-Bead: J-shaped; exposed long flange receives joint compound.
5. L-Bead: L-shaped; exposed long flange receives joint compound.
6. U-Bead: J-shaped; exposed short flange does not receive joint compound.
7. Expansion (control) joint.
8. Curved-Edge Cornerbead: With notched or flexible flanges.

JOINT TREATMENT MATERIALS

1. General: Comply with ASTM C 475/C 475M.
2. Joint Tape:
3. Interior Gypsum Wallboard: Paper.
4. Exterior Gypsum Soffit Board: Paper.
5. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
6. Tile Backing Panels: As recommended by panel manufacturer.
7. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
8. See "Joint Compound" Article in the Evaluations.
9. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
10. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
11. Use setting-type compound for installing paper-faced metal trim accessories.
12. Fill Coat: For second coat, use drying-type, all-purpose compound.
13. Finish Coat: For third coat, use drying-type, all-purpose compound.

EXECUTION

APPLYING AND FINISHING PANELS, GENERAL

1. Comply with ASTM C 840.
2. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
3. Detail perimeter isolation on Drawings. See "Crack Control" Article in the Evaluations.
4. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

APPLYING INTERIOR GYPSUM BOARD

1. Install interior gypsum board in the following locations:
2. Type X: As indicated on Drawings.
3. Abuse-Resistant Type: As indicated on Drawings.

APPLYING TILE BACKING PANELS

1. Water-Resistant Gypsum Backing Board: Install at restrooms and shower locations (see below for tile substrate applications. Install with 1/4-inch gap where panels abut other construction or penetrations.
2. Glass-Mat, Water-Resistant Backing Panel: Install at all tile locations. Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4-inch gap where panels abut other construction or penetrations.
3. Areas Not Subject to Wetting: Install regular-type gypsum wallboard panels to produce a flat surface except at showers, restrooms and other locations indicated to receive water-resistant panels.
4. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

INSTALLING TRIM ACCESSORIES

1. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
2. Interior Trim: Install in the following locations:
3. Cornerbead: Use at outside corners.
4. Bullnose Bead: Use at outside corners.
5. LC-Bead: Use at exposed panel edges.
6. L-Bead: Use where indicated.
7. U-Bead: Use at exposed panel edges.
8. Curved-Edge Cornerbead: Use at curved openings.

FINISHING GYPSUM BOARD

1. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
2. Prefill open joints and damaged surface areas.
3. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
4. Gypsum Board Finish Levels: Finish panels to levels indicated below:
    a. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
    b. Level 2: Panels that are substrate for tile.
    c. Level 3: Surfaces receiving medium- or heavy-textured finishes before painting or heavy wall coverings where lighting conditions are not critical.
    d. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated. Also at wall talker / marker board locations.
    e. Level 5: As defined on the interior elevations, if identified on the architectural drawings.

PROTECTION

Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

Remove and replace panels that are wet, moisture damaged, and mold damaged.

Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093000 - TILING

TILE PRODUCTS

1. Manufacturers: Architect and owner have pre-selected the tile and colors as shown in finish schedule. Substitutions are allowed pending architect's review and approval.
    a. Marazzi
    b. Florida Tile
    c. Daltile
    d. Other manufacturer's products may also be included. Reference the finish schedule and finish plan for additional information.

2. All other tile products not defined, to be provided by installing subcontractor.

3. Cementitious Backer Units: ANSI A118.9 in maximum lengths available to minimize end-to-end butt joints.

4. 1/4-inch (6.4-mm) thickness is available from C-Cure and Custom Building Products. 1/2-inch (12.7-mm) thickness is available from all manufacturers listed. 5/8-inch (15.9-mm) thickness is available from USG Corporation.

5. Thickness: 5/8 inch.

6. All tile accessories to be provided by installing contractor.

Products:

1. C-Cure; C-Cure Board 990.

2. Custom Building Products; Wonderboard.

3. FinPan, Inc.; Util-A-Crete Concrete Backer Board.

4. USG Corporation; DUROCK Cement Board.

5. Metal Edge Strips: Angle or L-shape, white zinc alloy ASTM A 666, 300 Series exposed-edge material.

PREPARATION

1. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

2. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions.

3. Remove protrusions, bumps, and ridges by sanding or grinding.

4. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

5. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

INSTALLATION, GENERAL

1. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

2. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.

3. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

4. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

5. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

6. Lay out tile wainscots to next full tile beyond dimensions indicated.

7. Refer to TCA's "Handbook for Ceramic Tile Installation" and to ANSI A108 Series of tile installation standards for data on expansion joints. Both require joint locations to be indicated on Drawings.

8. Expansion Joints: Locate expansion joints and other sealant-filled joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

9. Locate joints in tile surfaces directly above joints in concrete substrates.

10. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

11. Grout tile to comply with requirements of ANSI A108.10, unless otherwise indicated.

12. Apply grout sealer to grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

13. All restroom wall and floor tile to have epoxy grout.

END OF SECTION 093000

SECTION 095110 - ACOUSTICAL PANEL CEILINGS

SUMMARY

This Section includes acoustical panel ceilings installed with exposed suspension systems.

PART 1 GENERAL

SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

1. Product data for each type of product specified.
2. Samples for verification purposes of each type of exposed finish required, prepared on samples of size indicated below and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.
   A. 6-inch-square samples of each acoustical panel type, pattern, and color.
   B. Set of 12-inch-long samples of exposed suspension system members, including moldings, for each color and system type required.
3. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other information specified.
4. Research reports or evaluation reports of the model code organization acceptable to authorities having jurisdiction that show compliance of acoustical ceiling system and components with building code in effect for Project.
5. Product test reports from qualified independent testing laboratory that are based on its testing of current products for compliance of acoustical ceiling systems and components with requirements.

QUALITY ASSURANCE

1. Installer Qualifications: Engage an experienced Installer who has successfully completed acoustical ceilings similar in material, design, and extent to those indicated for Project.
2. Fire-Performance Characteristics: Provide acoustical ceilings that are identical to those tested for the following fire-performance characteristics, per ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
   A. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
      2) Flame Spread: 25 or less.
      3) Smoke Developed: 50 or less.
3. Single-Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
4. Single-Source Responsibility for Suspension System: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
   A. Obtain suspension system from same manufacturer that produces the acoustical ceiling units.
5. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).

DELIVERY, STORAGE, AND HANDLING

1. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
2. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
3. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

PROJECT CONDITIONS

1. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

EXTRA MATERIALS (ATTIC STOCK)

1. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with appropriate labels.
   B. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 5.0 percent of amount installed.
   C. Exposed Suspension System Components: Furnish quantity of each exposed component equal to 2.0 percent of amount installed.

PART 2 PRODUCTS

MANUFACTURERS

1. Products: Subject to compliance with construction drawings.
   B. See ceiling schedules contained in construction drawings which identify manufacturer and specific ceiling panel type.
   B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
      1) Armstrong Ceilings
      2) USG Ceilings
      3) Chicago Metallic Corporation.
      4) National Rolling Mills Inc.
      5) Donn Corporation

ACOUSTICAL CEILING UNITS, GENERAL

1. Standard for Acoustical Ceiling Units: Provide manufacturers' standard units of configuration indicated that comply with ASTM E 1264 classifications as designated by reference to types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
   B. Mounting Method for Measuring NRC: Type E-400 (plenum mounting in which face of test specimen is 15-3/4 inches [400 mm] away from the test surface) per ASTM E 795.

METAL SUSPENSION SYSTEMS, GENERAL

1. Standard for Metal Suspension Systems: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
2. Finishes and Colors: Provide manufacturer's standard factory-applied finish for type of system indicated.
3. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
4. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
   A. Gage: Provide wire sized so that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct-Hung), will be less than yield stress of wire, but provide not less than 0.106-inch diameter (12 gage).
5. Hanger Rods: Mild steel, zinc coated, or protected with rust- inhibitive paint.
6. Flat Hangers: Mild steel, zinc coated, or protected with rust inhibitive paint.
7. Angle Hangers: Angles with legs not less than 7/8 inch wide, formed with 0.0365-inch-thick galvanized steel sheet complying with ASTM A 446, Coating Designation G90, with bolted connections and 5/16-inch-diameter bolts.
8. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit type of edge detail and suspension system indicated.
   A. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.

B. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
C. For acoustical tile adhered to substrate, provide edge moldings at ceiling perimeters and where indicated.

9. Hold-Down Clips for Non-Fire-Resistance-Rated Ceilings: For interior ceilings composed of lay-in panels weighing less than 1 lb per sq. ft., provide hold-down clips spaced 2'-0" o.c. on all cross-tees.
10. Impact Clips: Where indicated, provide manufacturer's standard impact clip system design to absorb impact forces against lay-in panels.

NON-FIRE-RESISTANCE-RATED DIRECT-HUNG SUSPENSION SYSTEMS

1. Wide-Face Single-Web Steel Suspension System: Main and cross-runners roll-formed from prepainted or electrolytic zinc-coated cold-rolled steel sheet, with prepainted 15/16-inch-wide flanges; other characteristics as follows:
   B. Structural Classification: Intermediate-Duty System.
   C. Finish: Painted, white.

MISCELLANEOUS MATERIALS

1. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant complying with requirement specified in Division 7 Section "Joint Sealers."

PART 3 - EXECUTION

EXAMINATION

1. Examine substrates and structural framing to which ceiling system attaches or abuts, with Installer present, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected.

PREPARATION

1. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
   B. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.
2. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half-width units at borders, and comply with reflected ceiling plans.

INSTALLATION

1. General: Install acoustical ceiling systems to comply with installation standard referenced below, per manufacturer's instructions and CISCA "Ceiling Systems Handbook."
   B. Standard for Installation of Ceiling Suspension Systems: Comply with ASTM C 636.
2. Arrange acoustical units and orient directionally patterned units in a manner shown by reflected ceiling plans.
3. Suspend ceiling hangers from building structural members and as follows:
   A. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   B. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
   C. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

D. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices that are secure and appropriate for structure to which hangers are attached as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
    a. Space hangers not more than 4'-0" o.c. along each member supported directly from hangers, unless otherwise shown, and provide hangers not more than 8 inches from ends of each member.

4. Install edge moldings of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical units.
    A. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
    B. Screw-attach moldings to substrate at intervals not over 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12'-0". Miter corners accurately and connect securely.
5. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.
    A. Install hold-down clips in areas indicated and in areas where required by governing regulations or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.

CLEANING

1. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095110

SECTION 096516 & 096519 - RESILIENT SHEET / TILE FLOORING

PROJECT CONDITIONS

1. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor coverings.
2. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
3. Close spaces to traffic during floor covering installation.
4. Close spaces to traffic for 48 hours after floor covering installation.
5. Install floor coverings after other finishing operations, including painting, have been completed.

PRODUCTS

VINYL SHEET FLOOR COVERING

Products: Subject to compliance with requirements, provide the following:

1. Tajima Flooring Inc.
2. Shaw Contract
3. Milliken
4. Unbacked Vinyl Sheet Floor Covering: ASTM F 1913, minimum. 0.080 inch thick. Refer to the finish schedule for additional information.

PREPARATION

1. Extensive surface preparation is required over substrates from which existing floor coverings have been removed. Requirements vary among manufacturers. Insert requirements to suit Project.
2. Prepare substrates according to manufacturer's written instructions to ensure adhesion of floor coverings.
3. Concrete Substrates: Prepare according to ASTM F 710.
4. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
5. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
6. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
7. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
8. Follow manufacturer's requirements for moisture testing. Retain one or both subparagraphs below.
9. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
10. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
11. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
12. Do not install floor coverings until they are same temperature as space where they are to be installed.
13. Move floor coverings and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
14. Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation.

FLOOR COVERING INSTALLATION

1. Comply with manufacturer's written instructions for installing floor coverings.
2. Unroll floor coverings and allow them to stabilize before cutting and fitting.
3. Lay out floor coverings as follows:
4. Maintain uniformity of floor covering direction.
5. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in floor covering substrates.
6. Match edges of floor coverings for color shading at seams.
7. Avoid cross seams.
8. If required, insert requirements for special patterns here.
9. If built-in items are required to be set on top of floor coverings, indicate on Drawings and revise first paragraph below.
10. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.

11. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.
12. Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.
13. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
14. Integral-Flash-Cove Base: Cove floor coverings 6 inches up vertical surfaces. Support floor coverings at horizontal and vertical junction by cove strip. Butt at top against cap strip.

CLEANING AND PROTECTION

1. Comply with manufacturer's written instructions for cleaning and protection of floor covering.

END OF SECTION 096516

SECTION 096813 & 096816 - TILE & SHEET CARPETING

GENERAL

1. SECTION INCLUDES

   A. Carpet tile.
   B. Sheet carpet.

2. RELATED SECTIONS

   A. Section 03 30 00 - Cast-in-Place Concrete.

3. SUBMITTALS

   A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
   B. Product Data: Manufacturer's data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Installation methods.
   C. Verification Samples: For each finish product specified, two samples, representing actual product and finish.
   D. Extra Stock: Submit extra stock equal to 2% of total installed.

4. QUALITY ASSURANCE

   A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
   B. Installer Qualifications: Minimum 2 year experience installing similar products.
   C. Performance: Fire performance meeting requirements of building code and local authorities.
   D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
      1. Finish areas designated by Architect.
      2. Do not proceed with remaining work until workmanship is approved by Architect.
      3. Refinish mock-up area as required to produce acceptable work.

5. PRE-INSTALLATION MEETINGS

   A. Convene minimum two weeks prior to starting work of this section.

6. DELIVERY, STORAGE, AND HANDLING

   A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
   B. Handling: Handle materials to avoid damage.

7. PROJECT CONDITIONS

   A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

   B. Provide verification, in writing, that floor moisture is within tolerances of the flooring and adhesive manufacturer’s requirements.

8. SEQUENCING

   A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PRODUCTS

1. MANUFACTURERS:

A. Shaw Contract Group
B. J+J Flooring
C. Milliken
D. Patcraft
E. Requests for substitutions will be considered in accordance with provisions of Section 016000 - Product Requirements.

2. CARPET

A. Carpet Types – See Finish Schedule

EXECUTION

1. EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2. PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3. INSTALLATION

A. Comply with CRI 104 and carpet manufacturer's written installation instructions for the following:
   1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-Down Installation."
   2. Stretch-in Installation: Comply with CRI 104, Section 12, "Stretch-in Installation."
   3. Stair Installation: Comply with CRI 104, Section 13, "Carpet on Stairs" for glue-down installation.
B. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings, unless otherwise noted on the Finish Floor Plan.
C. Install pattern parallel to walls and borders, unless noted otherwise on the Architectural Finish Plan.

4. PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 096816

SECTION 098010 - HIGH IMPACT ACOUSTICAL WALL PANELS

GENERAL
WORK INCLUDES
A. Supply and installation of the acoustical wall panels.

REFERENCED STANDARDS

A. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2000.

B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2000a.

PERFORMANCE REQUIREMENTS

A. Acoustical Absorption: Perform testing in accordance with ASTM C 423, Type A mounting method unless otherwise specified.

B. Flame Spread Rating: Provide all components with Class A flame spread rating when tested in accordance with ASTM E 84, unless otherwise specified.

SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Independent testing agency test reports.

B. Selection Samples: For each product specified, two complete sets of color samples representing manufacturer's full range of available colors and patterns.

C. Verification Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 10 years of experience in producing acoustical products of the types specified herein.

B. Installer Qualifications: Acceptable to the manufacturer of the acoustical products being installed.

C. Mock-Up: Provide a mock-up for evaluation of installed appearance.
   1. Install acoustical products in areas designated by Architect.
   2. Do not proceed with remaining work until Architect approves workmanship and appearance.
   3. Approved mock-up may remain as part of the work.

D. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch for the following:
   1. Thickness.
   2. Edge straightness.
   3. Overall length and width.
   4. Squareness from corner to corner.
   5. Chords, radii and diameters.

DELIVERY STORAGE AND HANDLING

A. Do not begin installation of acoustical products until building has been enclosed and environmental conditions approximate those that will prevail when building is occupied.

B. Environmental Requirements: Do not install panels until wet work, such as concrete and plastering, is complete; the building is enclosed; and the temperature and relative humidity are stabilized at 60 – 80 degrees F (16 – 27 degrees C) and 40% to 50%, respectively.

EXTRA MATERIALS

A. Provide 2 percent, but not less than 1 of each type of acoustical unit actually installed, for Owner's use in maintenance.

PRODUCTS

MANUFACTURERS

A. Acceptable Manufacturer: G&S Acoustics; 3555 Scarlet Oak Blvd., St. Louis, MO 63122. ASD. Tel: (636) 225-8800 or (800) 737-0307. Fax: (636) 225-2966. Email: inquiry@gsacoustics.com. www.gsacoustics.com.

B. Substitutions will be considered. Provide full product submittal for architect's review and approval prior to award of contract.

C. Provide all acoustical products specified herein by a single manufacturer.

ACOUSTICAL WALL PANEL

A. High Impact Wrapped Fiberglass Panels: Resolute panels; compound core of 6 to 7 pcf (96 to 112 kg/cu m) fiberglass with chemically hardened edges, laminated to facing sheet of perforated 0.060 inch (1.5 mm) polyvinyl, with seamless finish material wrapped and bonded to back side of panels.
   1. Core Thickness: 1 inch (25.4 mm); NRC 0.80. (See plans for designated thickness).
   2. Core Thickness: 2 inches (51 mm); NRC 1.00.
   3. Size: As shown on plans.
   4. Finish Material: Guilford of Maine fabric selections, see plans for fabric selections.
   5. Edges: Square.
   6. Corners: Square.
   7. Mounting: Adhesive.
   8. Mounting: Impaling clips.

ACCESSORIES

A. Mounting Adhesive: Water-based, heavy-bodied adhesive as recommended by manufacturer of acoustical panels.

2.

A. Impaling Clips. Manufacturer's standard 1.5 by 5 inches (38 by 127 mm) mounting clips designed for impaling back side of fiberglass units.

3.

A. Two-Part Z-Clips: Manufacturer's standard mounting bar and matching clips for mounting on rear of acoustical panels.

EXECUTION

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.

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.

INSTALLATION

A. Install acoustical units in accordance with manufacturer's instructions.

B. Adhesive Mounting: Size back of panels at 18 inch (450 mm) on center in both directions with thin coating of adhesive in 4 inch (100 mm) squares. Center adhesive dabs the size of a large egg on each sized area, and press panel firmly against substrate, flattening adhesive. Block panel for not less than 24 hours until adhesive has set.

C. Impaling Clips: Fasten clips to wall at 48 inches (1220 mm) on center, with points facing upward. Attach panels by pressing downward and toward the wall, so points of clips are embedded firmly in back of panel.

D. Two-Part Clips: Fasten bars to wall at 48 inches (1220 mm) on center in both directions. Impale matching mechanical clips into back of panels in matching pattern and drop panel into position so clips fully engage into wall-mounted bars.

PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SPECIFICATION SECTION

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1..1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1..2 SUMMARY

A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.

Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.

B. Paint exposed surfaces whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1. Prefinished items not to be painted include the following factory-finished components:
   a. Toilet enclosures.
   b. Acoustic materials.
   c. Architectural woodwork and casework.
   d. Finished mechanical and electrical equipment.
   e. Light fixtures.
   f. Switchgear.
   g. Distribution cabinets.
2. Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas:
   a. Foundation spaces.
   b. Furred areas.
   c. Utility tunnels.
   d. Pipe spaces.
   e. Duct shafts.
3. Finished metal surfaces not to be painted include:
   a. Anodized aluminum.
   b. Stainless steel.
   c. Chromium plate.
   d. Copper.
   e. Bronze.
   f. Brass.
4. Operating parts not to be painted include moving parts of operating equipment such as the following:
   a. Valve and damper operators.
   b. Linkages.
   c. Sensing devices.
   d. Motor and fan shafts.
5. Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections: The following sections contain requirements that relate to this section:
   1. Division 5 Section "Structural Steel" for shop priming structural steel.
   2. Division 4 Section "Masonry" for sealing of all block products.

1..3 DEFINITIONS

A. "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1..4 SUBMITTALS

A. Product Data: Manufacturer's technical information, label analysis, and application instructions for each material proposed for use.
   1. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.

B. Samples for verification purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
   1. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
   2. Submit samples on the following substrates for the Architect's review of color and texture only:
      a. Concrete: Provide two 4-inch-square samples for each color and finish.
      b. Concrete Masonry: Provide two 4- by-8-inch samples of masonry, with mortar joint in the center, for each finish and color.
      c. Painted Wood: Provide two 12- by 12-inch samples of each color and material on hardboard.
      d. Stained or Natural Wood: Provide two 4- by 8-inch samples of natural and stained wood finish on actual wood surfaces.
      e. Ferrous Metal: Provide two 4-inch-square samples of flat metal and two 8-inch-long samples of solid metal for each color and finish.

1..5 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify the Architect of problems anticipated using the materials specified.

C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full- coat finish samples on at least 100 sq. ft. of surface until required sheen, color and texture are obtained; simulate finished lighting conditions for review of in-place work.
   1. Final acceptance of colors will be from job-applied samples.
   2. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted. Apply coatings in this room or surface in accordance with the schedule or as specified. After finishes are accepted, this room or surface will be used for evaluation of coating systems of a similar nature.

D. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
   1. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude equal products of other manufacturers.
   2. Federal Specifications establish a minimum quality level for paint materials, except where other product identification is used. Provide written certification from the manufacturer that mate-

rials provided meet or exceed these criteria.

3. Products that comply with qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to the Architect. Furnish material data and manufacturer's certificate of performance to Architect for proposed substitutions.

1..6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
   1. Product name or title of material.
   2. Product description (generic classification or binder type).
   3. Federal Specification number, if applicable.
   4. Manufacturer's stock number and date of manufacture.
   5. Contents by volume, for pigment and vehicle constituents.
   6. Thinning instructions.
   7. Application instructions.
   8. Color name and number.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
   1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1..7 JOB CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).

C. Do not apply paint in snow, rain, fog, or mist, when the relative humidity exceeds 85 percent, at temperatures less than 5 deg F (3 deg C) above the dew point, or to damp or wet surfaces.
   1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2..1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

   6. Ponderosa Paints
   7. Columbia Quality Coatings. (Fuller O'Brian Division).
   8. Benjamin Moore and Co. (Moore).
   9. The Sherwin-Williams Company (S-W).
   10. KWAL- HOWELLS Paint Co.

PART 3 - EXECUTION

2..2 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.

1. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

2..3 PREPARATION

A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
   1. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and re-prime. Notify Architect in writing of problems anticipated with using the specified finish-coat material with substrates primed by others.
   2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
      a. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
      b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
      c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, and rinse; allow to dry and vacuum before painting.

   3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
      a. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
      b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
      c. When transparent finish is required, backprime with spar varnish.
      d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
      e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.

   4. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
      a. Blast steel surfaces clean as recommended by the paint system manufacturer and in accordance with requirements of SSPC specification SSPC-SP 10.
      b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
      c. Touch up bare areas and shop-applied prime coats that have been damaged. Wirebrush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.

   5. Galvanized Surfaces: Clean galvanized surfaces with non- petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

C. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer's directions.

1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
3. Use only thinners approved by the paint manufacturer, and only within recommended limits.

D. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

2..4 APPLICATION

A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
1. Paint colors, surface treatments, and finishes are indicated in "schedules."
2. Provide finish coats that are compatible with primers used.
3. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.
4. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
6. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
9. Finish interior of wall and base cabinets and similar field- finished casework to match exterior.
10. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
11. Sand lightly between each succeeding enamel or varnish coat.
12. Omit primer on metal surfaces that have been shop-primed and touch up painted.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
2. AT INTERIOR WALL SURFACES, PAINTING SHALL TAKE PLACE IN (2) PHASES. THE FIRST (2) COATS OF PAINT TO BE SCHEDULED AT COMPLETION OF GYPSUM WALL AND CEILING ASSEMBLIES (MUDDING TAPING AND SANDING). FINAL COAT OF PAINT TO BE APPLIED JUST PRIOR TO SUBSTAINTIAL COMPLETION (AT TIME AGREED APON BETWEEN ARCHITECT, OWNER AND GENERAL CONTRACTOR)

D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.

E. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

F. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

G. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

2..5 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
1. Engage the services of an independent testing laboratory to sample the paint material being used. Samples of material delivered to the project will be taken, identified, sealed, and certified in the presence of the Contractor.
2. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are noncompatible.

2..6 CLEANING

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

2..7 PROTECTION

A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

B. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. ENTIRE WALL PLANE OF DAMAGED WALL SURFACES TO BE REPAINTED IF TOUCH-UP REQUIRED. NO SPOT TOUCH-UPS.

2..8 PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates indicated.

B. Ferrous Metal; Includes hollowmetal doors and frames.
1. First Coat: Speedhide Latex Gloss Enamel.
2. Second Coat: Speedhide Latex Gloss Enamel.

3. Not less than 5.6 mils total dry film thickness.
4. Not less than 4.0 mils dry film thickness, excluding primer coat.

C. Gypsum Drywall Systems: Painted on Walls and Ceilings.
1. First Coat: Speedhide Quick-Drying latex Primer Sealer.
2. Second Coat: Speedhide Latex eggshell Enamel.
3. Third Coat: Speedhide latex eggshell Enamel.
4. Not less than 5.- mils total dry film thickness.
5. Ceiling Paint to be eggshell.

D. Solid Core Doors (only where designated in plans):
1. First Coat: STAIN.
2. Second Coat: POLY URETHANE FINISH.
3. Third Coat: POLY URETHANE FINISH.

E. Gutters and Downspouts: Factory Finished.
F. Concrete:
1. Match Sherwin Williams H&C Silicone Acrylic Concrete Sealer. Color by Architect.

3.0 ATTIC STOCK

A. Provide min. (4) one gallon cans of each paint specified on project to remain onsite as “attic stock”. Clearly mark all paint for easy reference.

END OF SECTION 099123

SECTION 098700 - POLYURETHANE GYM FLOOR SYSTEM

GENERAL

SECTION INCLUDES

B. The complete installation of Robbins PULASTIC Classic 110 polyurethane surfacing over high-performance resilient base mat, by Robbins, Inc. of Cincinnati, Ohio, including adhesives, resilient base mat, polyurethane sealer, polyurethane structure layer, surface topcoat, and court markings.

RELATED REQ'S

A. Concrete and Concrete Finishing
   1. Concrete Slab Depression: a total of 11mm, equal to system thickness, (0.433 inches).
   2. Surface Finish: steel troweled and finished smooth.
   3. Concrete Tolerance: 1/8" (3mm) in radius of 10' (3m). Floor Flatness and Floor Levelness (FF and FL) numbers are not recognized.
   4. NO CURING AGENTS OR SEALERS ARE TO BE APPLIED TO THE CONCRETE SLAB.
B. Membrane Waterproofing and Dampproofing
   1. Concrete subfloors on or below grade shall be adequately waterproofed beneath the slab and at the perimeter walls and on the earth side of below grade walls by general contractor using suitable type membrane.
   2. Sand-Poly-Sand slab construction is not an acceptable construction.

QUALITY ASSURANCE

A. Floor System Supplier Qualifications
   1. Supplier shall be an established firm experienced in field and have been in business for a minimum of ten (10) years, Robbins, Inc. or an approved equal.
   2. Formulator shall be ISO-9001 certified for quality control, and ISO-14001 certified for environmental care, and provide copy of Certification document upon request.
B. Floor Contractor/Installer Qualifications and Certifications
   1. Floor Contracting Company and field personnel shall be trained by supplier on proper installation and finishing process.
C. System Industry Approvals
   1. Floor system shall be approved according to the EN 14904 Standard, in Category P1, and provide copy of Approval upon request.

SYSTEM TECHNICAL DATA

Character	Point-elastic		
Classification	P1		EN 14904
Nominal thickness	11 mm	(0.4331 inches)	
Shock Absorption	28%		EN 14808
Shock Absorption (DIN)	(35%)		(DIN 18032-91)
Vertical Deformation	1.4 mm		EN 14809
Linear Friction (dry)	98		EN 13036-4
Linear Friction (damp)	0.3		Leroux
Ball Bounce	98 %		EN 12235
Gloss	3%		EN 2813
Resistance to rolling load	≥1500 N		EN 1569

Resistance to impact	≥800 gr @ 10°C		EN 1517
	≥1200 gr @ 17°C		EN 1517
Resistance to indentation	0.35 mm @ 5 min		EN 1516
	0.15 mm @ 24 hrs		EN 1516
Resistance to wear	150 mg		EN ISO 2813
Flammability	B_{fl}-S_1		EN 13501-1
V.O.C. content - Adhesive	Solvent free		
V.O.C. content - Topcoat	0.01 gr/lit (EU)		2004/42/EG
	45 gr/lit (US)		ASTM D 3960
Adhesive composition	Free of solvents and heavy metals		
Resin composition	Free of solvents and heavy metals		
Elongation at break - Structure	150%		DIN 53455
Tensile Strength - Structure	8 N/mm2	(1,160 psi)	DIN 53455
Tear Strength - Structure	25 N/mm	(142 pli)	DIN 53455
Colour fastness	8 (excellent)		DIN 54004

SUBMITTALS

A. Manufacturer's Product Data
   1. Submit three (3) Robbins Pulastic Classic 110 Floor System specification sheets.
B. Concrete Guidelines
   1. Submit three (3) copies of Robbins Synthetic Concrete Recommendations for correct preparation, finishing and testing of concrete subfloor surfaces to receive granulated base mat and polyurethane floor system.
C. Samples
   1. Submit one (1) sample of Pulastic Classic 110
   2. Submit one (1) Pulastic Topcoat Standard Color Chart
   3. Submit one (1) Pulastic Linepaint Color Chart
D. Maintenance Literature
   1. Submit copy of Pulastic Maintenance Instructions.
E. References
   1. Submit Letter attesting that Floor Contractor and Field Personnel have been properly trained to perform work per specifications and contract.
   2. Reference list of three individual for whom installer has worked on projects of similar size and magnitude.

DELIVERY, STORAGE, AND HANDLING

A. Delivery of Materials
   1. Material shall not be delivered or installed until all masonry, painting, plastering, tile work, marble and terrazzo work are completed and all overhead mechanical work, lighting, backstops, scoreboards are installed. Room temperature shall be at least 55 degrees Fahrenheit, and ambient relative humidity shall be 80% or less. Moisture content of concrete substrate must be <5% by mass as measured with a Tramex® CME/CMExpert type concrete moisture meter. If moisture content of concrete substrate is >5% by mass as measured with Tramex® CME/CMExpert type, optional moisture mitigation systems or moisture tolerant primer can be applied. Contact Robbins Technical Support if numbers exceed recommendations (800-543-1913).

2. Area where materials are to be stored should be maintained at least 55 degrees Fahrenheit and under 75% relative humidity by the General Contractor.

*please refer to Robbins Technical Services “Concrete Guide Specification” for further information regarding conditions and requirements of concrete prior to installation.

JOB CONDITIONS - SEQUENCING

A. Do not install floor system until concrete has been cured 60 days and the requirements in paragraph 1.01 and 1.04 are obtained.
B. General Contractor is responsible to ensure slab is clean and free of all dirt and debris prior to floor installation beginning.
C. Permanent heat, light and ventilation shall be installed and operating during and after installation. Environmental temperatures must average a minimum of 65 degrees Fahrenheit for one full week proceeding, throughout, and 72 hours following application.
D. After floors are finished, area to be kept locked by general contractor to allow curing time for the paint and finish system(s). No other trades are to be allowed on floor until it is accepted in writing by owner or owner's authorized agent.

GUARANTEE

A. Guarantee shall not cover damage caused in whole or in part by casualty, ordinary wear and tear, abuse, use for which material is not designed, faulty construction of the building, settlement of the building walls, failure of the other contractors to adhere to specifications, separation of the concrete slab and excessive dryness or excessive moisture from humidity, spillage, migration through the slab or wall, or any other source.
B. Robbins, Inc. hereby warrants the Pulastic Classic 110 material to be free from manufacturing defects for a period of 25 years. This warranty is in lieu of all other warranties, expressed or implied including but not limited to any warranty of merchantability or fitness for a particular purpose, and of any other obligations on the part of Robbins. In the event of breach of any warranty, the liability of Robbins shall be limited to repairing or replacing Pulastic Classic 110 material and system components supplied by Robbins and proven to be defective in manufacture, and shall not include any other damages, either direct or consequential.

<u>PRODUCTS</u>

MATERIALS
NOTE: USE OF ANY NON-APPROVED COMPONENT SUBSTITUTIONS SHALL VOID WARRANTY.
A. Robbins PULASTIC
1. Adhesive
   a. Pulastic Tacly Adhesive: a two-component polyurethane adhesive
2. Shock Pad
   a. Shock Pad, a granulated rubber/polyurethane mat 9mm thick.
3. Pad Sealer
   a. Pulastic EG Sealer: a two-component polyurethane sealer
4. Polyurethane Resin
   a. Pulastic GM1500 Compound: a pigmented two-component polyurethane resin
5. Coating
   a. Pulastic Coating 221W: a pigmented, two-component, water-dispersed polyurethane surface coating.
      1) Color Options: SEE DESIGN DRAWINGS

6. Game line Paint
   a. Pulastic Linepaint: a pigmented, two-component polyurethane paint.
      1) Color Options: SEE DESIGN DRAWINGS

EXECUTION

INSPECTION

A. Inspect concrete slab for proper levelness tolerance, dryness, and possible contamination, (see Part 1 –Sec 1.01 and Sec. 1.04) and report any discrepancies to the general contractor and architect in writing.
B. All work required to put the concrete subfloors in acceptable condition shall be the responsibility of the general contractor.
C. Subfloor shall be broom cleaned by general contractor.
D. General Contractor will notify the flooring installation company to proceed with the installation after concrete slab specifications are met.
E. Installer shall perform tests for moisture and adhesion prior to application and report adverse conditions to the general contractor in writing.
F. Installer shall document all working conditions provided in General Specifications prior to commencement of installation.

INSTALLATION

A. Robbins Pulastic
   1. Shock Pad
      a. Mix two-component Tacly Adhesive according to supplier's instructions and spread adhesive using ROBBINS PULASTIC notched trowel.
      b. Unroll polyurethane/rubber granulated base mat into freshly applied adhesive. Seams shall be in virtual contact with absence of compression fit. Roll surface of base mat with a medium-size roller.
   2. Sealer
      a. Mix two-component EG Sealer according to supplier's instructions and spread sealer over base mat using a straight trowel. Allow to cure minimum 12 hours before proceeding.
   3. Structure Layer
      a. Mix two-component ROBBINS PULASTIC GM1500 pigmented polyurethane resin and spread over EG Sealer according to supplier's instructions. Allow to cure minimum 12 hours before proceeding.
      b. Mix two-component ROBBINS PULASTIC GM1500 pigmented polyurethane resin and apply at proper thickness according to supplier's instructions. Allow to cure minimum 12 hours before proceeding.

   4. TopCoat
      a. Mix two-component ROBBINS PULASTIC Coating 221W and apply using ROBBINS PULASTIC ½" nap roller(s) according to suppliers' instructions. Allow 24 to 48 hours curing time before proceeding.
   5. Gamelines
      a. Mix two-component ROBBINS PULASTIC PU-Linepaint according to supplier's instructions.
      b. Line painting should be in accordance with supplier's directions.
      c. Color of court markings shall be chosen from ROBBINS PULASTIC PU-Linepaint standard colors.
      d. Consult architectural drawings for game line locations and chosen colors.
B. Perimeter Molding (Optional):
   1. Install a rubber base, anchored to the walls with standard base cement.

CLEANING

A. Clean up all unused materials and debris and remove from the premises. Dispose of empty containers in accordance with federal and local regulations.

PROTECTION

A. Cure Time
   1. No traffic or other trades shall be allowed on the surface for a period of one week following completion to allow for complete and proper cure of the finish.
B. Other Trades

1. It shall be the responsibility of the general contractor to protect the surface from damage by other trades before acceptance by the owner or the owner's authorized agent.

C. Safety
1. No smoking, open flames or sparks from electrical equipment or any other source shall be permitted during the installation process, or in areas where materials are stored

END OF SPECIFICATION SECTION

SECTION 102114 - SOLID HDPE RESTROOM PARTITIONS

GENERAL

SECTION COVERS:

A. Solid plastic toilet compartments.
B. Solid plastic urinal screens.

ABBREVIATIONS

A. HDPE: High-density polyethylene.

REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2024b.
C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
D. ASTM A743/A743M - Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application; 2021.
E. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.
F. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2023.
G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
K. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
L. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

ADMINIATRATIVE REQ'S

A. Coordination: Coordinate work with placement of support framing and anchors in walls and ceilings.

SUBMITTALS

A. See SUBMITTALS sections for administrative requirements for submittal procedures.
B. Product Data: Provide data on panel construction, hardware, accessories and finishes.
C. Shop Drawings:
    1. Indicate plans, elevations and dimensions. Include door swings, toilet fixture centerlines, and floor drains on plans.
    2. Indicate details of wall and floor supports and attachments.
    3. Indicate cutouts for through-partition toilet accessories.
D. Samples:
    1. For Initial Selection: Submit color charts.
    2. For Verification: Submit [two] samples of partition materials, 3 inches by 3 inches (76 mm by 76 mm) in size, indicating color.

QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

DELIVERY STORAGE AND HANDLING

E. Deliver, store, and handle materials and products in accordance with manufacturer's instructions and recommendations and industry standards.
F. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at minimum of 60 degrees F (15.6 C).
G. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.
H. Lay cartons flat, with adequate support to ensure flatness and prevent damage to prefinished surfaces.
I. Do not store where ambient temperature exceeds 120 degrees F (49 C).

FIELD CONDITIONS

A. Ambient Conditions: Maintain environmental conditions such as temperature, humidity, and ventilation within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
B. Ambient Conditions: Maintain building temperature at minimum of 60 degrees F (15.6 C) for 48 hours before, during, and after installation of toilet partitions.
C. Existing Conditions: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

WARRANTY

A. Manufacturer Warranty: Provide 25-year manufacturer warranty for HDPE material against breakage, corrosion, and delamination.

PART 2 - PRODUCTS

MANUFACTURER

A. Basis of Design Manufacturer: ASI Global Partitions: www.asi-globalpartitions.com/#sle.
B. Substitutions: [See Section 016000 - Product Requirements
   1. Submit proposed substitutions in writing for approval by Architect prior to award of contract.
C. Source Limitations: Furnish products [produced by single manufacturer.

PLASTIC TOILET COMPARTMENTS

A. Toilet Compartments: Solid plastic (HDPE), standard privacy, floor anchored, overhead braced.
B. Urinal Screens: Solid plastic (HDPE) floor-mounted pilaster.
C. Entrance Screens: Solid plastic (HDPE), match toilet compartment mounting.
D. Design Criteria:
   1. Accessibility: Design compartments indicated on drawings to comply with ICC A117.1 and ADA Standards.
   2. Fire Performance: Provide assemblies that pass when tested in accordance with NFPA 286.
   3. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less (Class B), when tested in accordance with ASTM E84.
E. Fabrication:
   1. Fabricate toilet compartment components to sizes indicated.
   2. Coordinate requirements and provide cutouts for through-partition toilet accessories.
   3. Provide shoes and caps at pilasters and posts to conceal anchorage, supports, and leveling mechanisms.
      a. Provide Easy-Stall shoes at floor anchored, overhead braced toilet compartments.

4. Provide manufacturer's standard corrosion-resistant supports, leveling mechanisms, anchors, and anchoring assemblies for pilasters and posts.
5. Floor-Anchored, Overhead-Braced Units: Provide supports, leveling mechanisms, Easy-Stall shoes, and anchors at pilasters to suit floor conditions.
6. Urinal and Entrance Screen Posts: Provide anchoring assemblies with leveling adjustment at bottoms of posts.

COMPONENTS

A. Doors and Panels: Single sheets of solid molded homogenous high-density polyethylene (HDPE).
   1. Finish:
      a. Color: As listed on construction drawings..
      b. Texture: Manufacturer's standard for selected color.
   2. Edges: 1/4-inch (6 mm) radius machined edges.
   3. Heat Sink: Extruded aluminum attached to bottom of doors and panels.
   4. No Sight-55 Privacy Option: Provide compartments with no-sightline privacy strips.
B. Door and Panel Dimensions:
   1. Thickness: 1 inch (25 mm).
   2. Door Width: 24 inches.
   3. Door Width for Handicapped Use: 36 inches (915 mm).
   4. Door Panel Height: 55 inches (1397 mm).
   5. Door Height Above Floor: 14 inches (355 mm).
   6. Panel Depth: As indicated on drawings.
   7. Urinal/Entrance Screen Panel Height: 55 inches (1397 mm).
   8. Urinal/Screen Screen Panel Height Above Floor: 14 inches (355 mm).
C. Pilasters: 1 inch (25 mm) thick, of sizes required to suit compartment width and spacing; minimum 3 inches (76 mm) wide.
   1. Pilaster Height: 82 inches (2032 mm).
   2. Easy-Stall Pilaster Shoes: Formed 20 gauge, 0.0359 inch (0.91 mm)[ASTM A666 Type 304 stainless steel with No.4 finish concealing floor fastenings and leveling bolts; secured to pilaster with stainless steel tamper-resistant screws; secured to floor with concrete anchors.
      a. Provide height and leveling adjustment with machine thread leveling bolts and bottom of pilaster threaded inserts.
      b. Provide Easy-Stall shoes at floor anchored, overhead braced toilet compartments.
D. Urinal or Entrance Screen Post: Manufacturer's standard post design of [square aluminum tube with satin finish 1-3/4 by 1-3/4 inches (44 by 44 mm) with shoe matching that on pilaster.
E. Head Rails: Hollow anodized aluminum tube, 1- by 1-5/8-inch (25 by 41 mm) size, with anti-grip surface and cast-socket wall brackets.

MATERIALS

A. Aluminum Castings: ASTM B26/B26M.
B. Aluminum Extrusions: ASTM B221 (ASTM B221M).
C. High-Density Polyethylene (HDPE):
   1. Composition: Formed from waterproof, nonabsorbent, high-density polyethylene resins.
   2. Properties: Mark-resistant self-lubricating surface.
   3. Fire Resistance: ASTM E84, Class B.
   4. Material Fire Ratings: NFPA 286, Pass.
   5. Material Fire Ratings: ICC (IBC), Class B.
D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.
E. Stainless Steel Castings: ASTM A743/A743M.
F. Zamac: ASTM B86, commercial zinc-alloy die castings, chrome-plated.

HARDWARE AND ACCESSORIES

A. Brackets:
   1. Continuous Type: Clear anodized aluminum, standard depth.
B. Door Hardware: Clear anodized aluminum:
   1. Hinges: 8 inch (203 mm) wrap-around pivot hinges, gravity type, adjustable for door close positioning; two per door.
   2. Latch and Keeper: 6 inch (152 mm) slide latch with wrap-around keeper.
   3. Coat Hook: Chrome-plated zamac. Manufacturer's standard coat hook with rubber bumper; one per compartment, mounted on [door] [panel].
   4. Door Pull: Chrome-plated zamac. Provide door pull for outswinging doors. Provide on both sides of doors designated as accessible.
   5. Door Bumper: Chrome-plated zamac. Provide rubber-tipped door bumpers at out-swinging doors.
C. Attachments, Screws, and Bolts: Chrome-plated zamac , tamper-resistant type..
   1. For Attaching Panels and Pilasters to Brackets: Sex-type through-bolts and nuts , tamper-resistant.

EXECUTION

EXAMINATION

A. Verify that field measurements are as [indicated] [indicated on shop drawings.
B. Verify correct spacing of and between plumbing fixtures.
C. Verify correct location of built-in framing, anchorage, and bracing.

INSTALLATION
A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
B. Attach Easy Stall shoe system to floor with 1/4 by 2 inch (6 by 52 mm) screws. Insert pilaster into Easy Stall shoe and secure after height adjustment.
C. Maintain maximum 1/2-inch (13 mm) space between pilasters and panels.
D. Maintain maximum 1-inch (25 mm) space between wall and panels.
E. Attach panel brackets securely to walls using anchor devices.
F. Attach panels and pilasters to brackets. [Locate head rail joints at pilaster centerlines.
G. Do not permit field touch-up of scratches or damaged finish. Replace damaged or scratched materials with new materials.

TOLERANCES

A. Maximum Variation From True Position: 1/4 inch (6 mm).
B. Maximum Variation From Plumb: 1/8 inch (3 mm).

ADJUSTING
A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).
B. Adjust hinges to locate doors in partially opened position when unlatched. Return outswinging doors to closed condition.
C. Adjust adjacent components for consistency of line or plane.

CLEANING

A. Clean partition and screen surfaces with materials and cleansers in accordance with manufacturer's recommendations.

END OF SPECIFICATION SECTION

SECTION 104413 - FIRE EXTINGUISHERS AND CABINETS

SUMMARY

Section includes fire protection cabinets for fire extinguishers.

SUBMITTALS

Product Data: For each type of product indicated.

Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

NCE & MATERIALS

Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

Coordinate sizes and locations of fire protection cabinets with wall depths.

NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

Coordinate type and capacity of fire extinguishers with fire local fire Marshall having jurisdiction and with protection cabinets to ensure fit and function.

Fire Extinguishers: Type, size, and capacity AS REQUIRED BY JURISDICTION.

FIRE PROTECTION CABINET

Cabinet Type:
Suitable for fire extinguisher.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

A. Fire End & Croker Corporation;.
B. J. L. Industries, Inc., a division of Activar Construction Products Group.
C. Kidde Residential and Commercial Division, Subsidiary of Kidde plc.
D. Larsen's Manufacturing Company.
E. Modern Metal Products, Division of Technico Inc.
F. Moon-American.
G. Potter Roemer LLC.
H. Watrous Division, American Specialties, Inc.

Cabinet Construction:

A. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.0428-inch- thick, cold-rolled steel sheet lined with minimum 5/8-inch- thick, fire-barrier material. Provide factory-drilled mounting holes.
B. Cabinet Material: Steel
C. Recessed Cabinet: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.

D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on wall with no trim. Provide where walls are of insufficient depth for semirecessed cabinet installation.

Accessories:

A. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
B. Break-Glass Strike: Manufacturer's standard metal strike, complete with chain and mounting clip, secured to cabinet.
C. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
D. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as required by jurisdiction.

Finishes:

Manufacturer's standard baked-enamel paint.

INSTALLATION

Install fire protection cabinets in locations and at mounting heights required by jurisdiction.

Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

Identification: Apply decals at locations indicated.

Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

Examine fire extinguishers for proper charging and tagging.

Remove and replace damaged, defective, or undercharged fire extinguishers.

Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION 104413

SECTION 116653 - FOLDING RETRACTABLE GYMNASIUM DIVIDERS

SUMMARY

A. Section Includes
   1. Gymnasium Divider Curtains.
      a. Slope Fold Gymnasium Divider Curtain.

REFERENCES

A. ASTM E-84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
B. Federal Standard 191 – Textile Test Methods.
C. NFPA 701 – Methods of Fire Tests for Flame-Resistant Textiles and Films.
D. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

SUBMITTALS

A. Comply with SUBMITTAL Section.
   2. Certificates: Submit manufacturer's certificates for proof that all materials comply with specified requirements.
   3. Design Data: Submit manufacturer's design data, including loads to be transmitted to building structural members with requirements of any additional structure needed.
   4. Field Test Reporting: Submit manufacturer's certified destructive test reports completed by an accredited independent testing laboratory, indicating compliance with any specified factor or safety.
   5. Shop Drawings: Submit manufacturer's shop drawings, including elevations, plans, sections, layouts, component locations, dimensions, tolerances, fabrication details, materials, finish, quantities, hardware, fittings, electrical wiring diagrams, additional structure needed details, and method of attachment.
   6. Product Data: Submit manufacturer's product data, including proposed components, fabrication, finish, and materials.
   7. Samples: Submit manufacturer's color samples, including 18 ounce solid vinyl, 22 ounce solid vinyl, and 9 ounce vinyl mesh.
   8. Installation, Operation, and Maintenance Instructions: Submit installation, operation, and maintenance instructions including detailed step-by-step installation, troubleshooting, general operation instructions, and any recommended routine maintenance.
   9. Warranty: Submit manufacturer's guarantees and warranty information on a system and/or component.

QUALITY ASSURANCE

A. Manufacturer Qualification: All components to be provided from a single source manufacturer.
B. Installer Qualification: All components to be installed by a trained and qualified installer approved by the manufacturer.
C. Welding Certification: All welding to be completed by a certified welder in accordance to the American Welding Society (AWS), D1.1, "Structural Welding Code – Steel."

DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver divider curtain in original manufacturer's containers, with all containers grouped together, with labels clearly labeling the manufacturer and contents. Upon delivery, immediately inspect delivery for any missing containers or damage. Any damage or defects shall be noted and reported to the Owner's Representative.
B. Storage: Store containers in a clean, dry indoor location.
C. Handling: Protect materials and finish during handling and installation.
D. Replacements: If necessary, replacements shall be immediately re-ordered, so as to minimize any conflict with the construction schedule.

WARRANTY

A. Curtain system shall be guaranteed against defects in material and workmanship for a period of one (1) year. Other components may be covered by their own extended warranty.

MANUFACTURER

A. Jaypro Sports, LLC. 976 Hartford Turnpike, Waterford, Connecticut 06385. Toll Free 800-243-0533. Phone 860-447-3001. Fax 800-988-3363. Email info@jaypro.com. Web www.jaypro.com.
B. Manufactures of equivalent products will be considered in accordance with Section 01 25 13, Product Substitution Procedures.

GYMNASIUM DIVIDERS

**INSTALLING CONTRACTOR TO REVIEW DRAWINGS. SPECIFICATION SECTION COVERS STRAIGHT (FOLD-UP) AND GABLED (SLOPED FOLD-UP) CONDITIONS.

A. Fold-Up Gymnasium Divider, Model Number FC-680.
    10. Size: See Architectural Drawings for size. Single continuous section.
    11. Operation: Electrically operated, accordion style fold-up action.
    12. Drive System: UL listed, 1 HP, 110VAC 60hz Single-phase compensating type instantly reversible winch, direct drive, self lubricating gearing, with built-in POSILOK TM over-speed arrest system, and integral limit switches to control curtain travel.
    13. Hoist Cables: 1/8" diameter aircraft cable, galvanized, 1800 pound break strength. Spaced 9'-3" on-center and 6" inward from curtain edges. Secured to top drive pipe and bottom batten. Cables constrained by cable spool guides on drive pipe to ensure straight and compact rolling action.
    14. Fold Pattern:
        a. Symmetric: Hoist cables weaved through #4 metal grommets spaced 18" on-center to allow symmetric curtain fold balanced about the curtain centerline.
        b. Offset: Hoist cables passed through D-rings spaced 18" on-center to allow curtain to fold to one side of the curtain centerline.
    15. Drive Pipe: 2-3/8" outer diameter galvanized pipe supported by drive pipe carriers.
    16. Configuration:
        a. Solid Vinyl & Vinyl Mesh Combination
            i. Lower Section of Curtain: 8'-0" high, 18 ounces per square yard solid vinyl, washable, resistant to fade, rot, mildew, and fungus. Fire retardant ratings meeting requirements of NFPA 701 Test Method 2, ASTM E-84 Class A, and State of California test requirements.
            ii. Color - Architect to select color based on manufacturer standard color offering.
            iii. Upper Section of Curtain: 9 ounces per square yard vinyl mesh, washable, resistant to rot, mildew, and fungus. Fire retardant ratings meeting requirements of NFPA 701 Test Method 2, State of California test requirements, and Fed. Std 191 Method 5903.2.
            iv. Color- Architect to select color based on manufacturer standard color offering.
    17. Internal Seams: All seams electronically RF welded vertically with 1" contact weld for resistance to tearing and breakaway.
    18. Side Edges: Triple turned with double welds.
    19. Curtain Top: 6" pocket formed with horizontal weld to conceal 1.66" outer diameter top batten pipe supported from drive pipe carrier assemblies by No. 2/0 coil proof chain.
    20. Curtain Bottom: 8" padded pocket formed with horizontal weld to conceal 1.66" outer diameter bottom batten pipe.
    21. Attachment: Rigidly suspended from building structure with heavy duty clamp style fittings.
    22. Control System: Wall mounted, three-position momentary contact key switch with polished wall plate located so the operator has full view of curtain during operation.
B. Slope Fold Gymnasium Divider, Model Number SC-685.
    1. Size: Slope fold-up, See Architectural Drawings for size. One section curtain.
    2. Operation: Electrically operated, accordion style fold-up action.
    3. Drive System: UL listed, 1 HP, 110VAC 60hz Single-phase compensating type instantly reversible winch, direct drive, self lubricating gearing, with built-in POSILOK TM over-speed arrest system, and integral limit switches to control curtain travel.
    4. Hoist Cables: 1/8" diameter aircraft cable, galvanized, 1800 pound break strength. Spaced 9'-3" on-center and 6" inward from curtain edges.
    5. Cable Routing: Cable to terminate at bottom batten, pass through D-rings spaced 18" on-center, pass through a pulley at the top of the curtain and terminate at individual drive spools of differing diameters rotating in drive mule assembly.

6. Offset Fold Pattern: Curtain to fold to one side of the curtain. Complete fold to follow contour of roof structure.
7. Single hoist cable “clew” system shall not be approved as equal.
8. Drive Pipe: 2-3/8” outer diameter galvanized pipe supported by drive pipe carriers.
9. Configuration:
    a. Solid Vinyl & Vinyl Mesh Combination
        i. Lower Section of Curtain: 8’-0” high, 18 ounces per square yard solid vinyl, washable, resistant to fade, rot, mildew, and fungus. Fire retardant ratings meeting requirements of NFPA 701 Test Method 2, ASTM E-84 Class A, and State of California test requirements.
        ii. Color - Architect to select color based on manufacturer standard color offering.
        iii. Upper Section of Curtain: 9 ounces per square yard vinyl mesh, washable, resistant to rot, mildew, and fungus. Fire retardant ratings meeting requirements of NFPA 701 Test Method 2, State of California test requirements, and Fed. Std 191 Method 5903.2.
        iv. Color - Architect to select color based on manufacturer standard color offering.
10. Internal Seams: All seams electronically RF welded vertically with 1” contact weld for resistance to tearing and breakaway.
11. Side Edges: Triple turned with double welds.
12. Curtain Top: 6” pocket formed with horizontal weld to conceal 1.66” outer diameter top batten pipe supported from drive pipe carrier assemblies by No. 2/0 coil proof chain.
13. Curtain Bottom: 8” padded pocket formed with horizontal weld to conceal 1.66” outer diameter bottom batten pipe.
14. Attachment: Rigidly suspended from building structure with heavy duty clamp style fittings.
15. Control System: Wall mounted, three-position momentary contact key switch with polished wall plate located so the operator has full view of curtain during operation.

EXAMINATION

A. Examine areas of installation for any conditions that would affect the installation of the gymnasium equipment. If conditions exist that prohibits or hinders installation, notify the Architect and do not proceed with the installation until conditions have been resolved.

INSTALLATION

A. Install equipment in accordance with manufacturer’s instructions.
B. Install equipment level, straight, accurate in accordance with the supplied drawings and at the correct locations specified.
C. Install equipment with supplied hardware, fittings, and components.
D. Take care to keep curtain fabric clean during install and not damage equipment or finish. Touch up finish if necessary.
E. For electrically operated equipment, install electrical power in accordance with Section 26, Electrical.
F. For electrically operated equipment, install control system such that the operation of the equipment can been seen in clear sight.

ADJUSTING

A. Adjust gymnasium equipment as needed to function properly and to ensure accurate position in both stored and in-use positions.
B. For electric powered gymnasium equipment, adjust upper and lower limit switches as need to achieve desired heights.

CLEANING

A. Clean gymnasium equipment in accordance with manufacturer’s instructions.
B. Do not use harsh cleaning methods or supplies that may alter the finish of the gymnasium equipment.

DEMONSTRATION

A. Demonstrate complete operation of the gymnasium equipment to the Owner Representative.
B. Advise Owner Representative of operation procedure and required maintenance.
C. Furnish Owner Representative with means necessary to operate gymnasium equipment.

PROTECTION

A. For installations of gymnasium equipment with finished floor already installed, provide means of protecting the floor to prevent damage.

END OF SPECIFICATION SECTION

SECTION 122413 - MANUALLY OPERATED CHAIN AND CLUTCH / MOTORIZED WINDOW SHADES (ROLLER SHADES)

1.GENERAL

1.1. SECTION INCLUDES

A. Sunscreen roller shades.

B. Room darkening roller shades.

C. Room darkening and sunscreen double roller shades.

1.2. RELATED SECTIONS

A. Section - Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.

B. Section - Acoustical Ceilings: Coordination with acoustical ceiling systems for installation of shade pockets, closures and related accessories.

C. Division 16 - Electrical: Electric service for motor controls.

1.3. REFERENCES

A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

B. NFPA 70 - National Electrical Code.

C. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.4. SUBMITTALS

A. Submit to architect for review and approval.

B. 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: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.

D. 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.

E. Selection Samples: For each finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.

F. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.

G. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.5. QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer

with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

B. Installer Qualifications: Installer 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 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.

E. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Deliver shades 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.

1.7. 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.

1.8. WARRANTY

A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating twenty-five year limited warranty.

B. Standard Shadecloth: Manufacturer's standard twenty-five year warranty.

C. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

2.PRODUCTS

2.1. MANUFACTURERS

A. Acceptable Manufacturer: Mecho, which is located at: 42-03 35th St.; Long Island City, NY 11101; Tel: 718-729-2020; Fax: 718-729-2941; Email: communications@mechoshade.com; http://www.mechoshade.com

B. Substitutions: Permitted. Provide full product submittal for architect’s review and approval prior to contract.

C. Alternates: The following products and manufacturers may be bid as an alternate product in accordance with Section 01 23 00 - Alternates. Any pricing for alternate products shall be listed separately from the base bid specified product. Any alternate pricing must include line-by-line compliance or non-compliance with the specifications. If the alternate product is acceptable to the Architect, the specified manufacturer will be given the opportunity to provide an equivalent proposal.

2.2. ROLLER SHADE TYPE AND SHADECLOTH

A. Manually Operated Shades:

1. Mounting: Surface mounted with fascia.

2. Configuration: Single solar shadecloth.
3. Solar Shadecloths:

a. Fabric: EcoVeil 0950, TPO Cradle to Cradle Certified, fabric, non-PVC, 1 x 1 basket-weave pattern at 1 percent open. Colors match 1350 (5 percent open) and 1550 (3 percent open).

b. Color: Selected from manufacturer's standard colors.

4. Mecho5x, Managed Lift Force, Hardware: Lifts single band or multiband shade assemblies:
   a. Lifting Force: 3.5 to 8.5 pounds (1.6 to 3.9 kg) for shade assemblies with a shade band hanging weight, not including mounting hardware, of 35 pounds (16 kg).
   b. Backward compatible to Mecho-5 components including facia, regular and reverse roll, pockets, and wall-mounting accessories.
   c. Includes offset drive capability, left/right, front, or back to allow for utilization of black-out or ShadeLoc Zipper channels.
   d. Allows for ease of operation when obstructions do not allow for direct drive chain access.
   e. Offset chain drive shall not cause an increase of friction or pull force when operated up to a 26 degree angle from vertical.

2.3. SHADE BAND

A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
   1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
   2. Shade Band and Shade Roller Attachment:
      a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades, and less than 2.55 inches (64.77 mm) for motorize shades are not acceptable.
      b. Provide for positive mechanical engagement with drive / brake mechanism.
      c. 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.
      d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
      e. Any method of attaching shade band to roller tube that requires the use of adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.4. SHADE FABRICATION

A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.

B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design. Fabricate hem as follows:
   1. Hembar: Concealed hembar.

C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

D. For railroaded shadebands, provide seams in railroaded multi-width shadebands 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

shadebands.

E. 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 shadebands.

2.5. 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 Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.

B. Manual Operated Chain Drive Hardware and Brackets, Mecho5x:
   1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
   2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
   3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
   4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
   5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
   6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable
   7. Provide shade hardware constructed of minimum 1/8 inch (3 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
   8. Drive Bracket / Brake Assembly:
      a. Mecho Drive Bracket model Mecho5x shall be fully integrated with all Mecho accessories, including, but not limited to: SnapLoc fascia, SnapLoc Zipper channels, room darkening side / sill channels, center supports and connectors for multi-banded shades.
      b. Mecho5x drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.5 mm) steel pin.
      c. The brake shall be an over-running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.
      d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
      e. The entire Mecho5x assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
      f. Drive Chain: No. 10 qualified stainless steel chain rated to 90 lbs (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

2.6. 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.
5. Notching of Fascia for manual chain shall not be acceptable.

3.EXECUTION

3.1. EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2. PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3. INSTALLATION

A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (51 mm) to interior face of glass. Allow proper 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.

C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

D. Engage Installer to train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.

3.4. PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SPECIFICATION SECTION

SECTION 123531 - MANUFACTURED CABINETS AND CASEWORK

SUMMARY

A. Architectural wood casework.
B. Closet and utility shelving.
C. Specialty wood casework.
D. Wood furring, blocking, shims, and hanging strips for installing architectural wood cabinets that are not concealed within other construction.

PRODUCT HANDLING

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 20 percent to 50 percent.

Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

JOB CONDITIONS

Observe on site humidity levels and there possible effects on casework expansion / contraction prior to fabrication and installation.

Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.

Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.

After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.

Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

PRODUCTS

Drawings and specifications are based on manufacturer's literature, fixed modular, flexible rail mounted, and mobile casework and accessories. Other manufacturers shall comply with the minimum levels of material and detailing indicated on the Drawings or as specified.

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.

INSTALLATION

1. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
2. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
3. Repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged cabinets or materials.

CLEANING

1. Leave cabinets broom clean inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.
2. Remove and dispose of all packing materials and related construction debris.

COLOR SELECTION

1. Laminate Color Selection: As listed on finish schedule.
2. Cabinet Faces, Doors and Overlays: As listed on finish schedule.
3. Counters. As listed on finish schedule.
4. Hinge and Pull Color Selection: Brushed nickel.

END OF SECTION 123531

SECTION 133416 TELESCOPIC BLEACHER SYSTEM

SUMMARY
Manufacture, deliver and install Telescopic Seating Systems in accordance with applicable codes, the following specifications, and approved drawings. Telescopic seating system shall be multiple tiered seating rows comprised of seat and deck components, risers, and supportive understructure.
Telescopic seating shall be operable on the telescopic principle, stacking vertically in minimum floor area when not in use. The first moving row, on manual sections, shall be secured with release lever. All other rows shall be mechanically locked, operable only upon unlocking and cycling of first row. Power sections shall be secured with mechanical locks as well as the power system, operable upon activating the pendant control.

QUALITY ASSURANCE / DESIGN LOAD CRITERIA
C. International Building Code Standard: Comply with requirements of IBC / ICC 300, "Standard for Bleachers, Folding and Telescopic Seating and Grandstands Assembly Seating, except where other requirements are indicated by the architect/owner.
D. Seating layout design shall be in compliance with IBC / ICC 300 Code, Chapter 4.
E. Manufacturer: Irwin Telescopic Seat Company, or approved equivalent.
F. Engineer Qualifications: Manufacturer to employ a registered, licensed Professional Engineer to certify that the equipment to be supplied meets or exceeds the design criteria of this specification.
G. Installation: Shall be handled directly by the manufacturer or by a factory certified installation subcontractor.
H. Product Liability: Certification of insurance coverage of not less than $5,000,000.
I. Welding Processes: To be performed by certified professional welding operators in accordance with American Welding Society, (AWS), D1,1 "Structural Welding Code-Steel."
J. Product Improvements: Equipment provided shall incorporate manufacturer's design improvements and materials current at time of shipment, provided that such improvements and materials are consistent with the intent of these specifications.

SUBMITTALS
K. Manufacturer's descriptive literature and specifications.
L. List of deviations from these specifications, if any.
M. Certification of Insurance.
N. Shop Drawings showing all equipment to be furnished with details of accessories to be supplied including necessary electrical service to be provided by others. All electrical submittals must include U.L. listing number. Provide underfloor blocking requirements in submittal.
O. Samples of material and color finish to be reviewed by Architect
P. Warranty, operation and maintenance instructions to the owner upon completion.

DESIGN CRITERIA
A. Telescopic seating shall be designed to support, in addition to its own weight, and the weight of added accessories, a uniformly distributed live load of not less than 100 lbs. per sq. ft. (4.8 kN per sq. m.) of gross horizontal projection. Seat boards and footrest shall be designed for a live load of not less than 120 lbs. per linear foot (1.751 kN per linear m).
B. A sway force applied to seats shall be 24 lbs. per linear ft. (350 N per linear m.) parallel to the seats and 10 lbs. per linear ft. (146 N per linear m.) perpendicular to the seats. Sway forces shall not be considered simultaneously applied.
C. Railings, posts and sockets designed to withstand the following forces applied separately:
D. Handrails shall be designed and constructed for:
A. A concentrated load of 200 lbs. (890 N) applied at any point and in any direction.
B. A uniform load of 50 lbs. per ft. (730 N/m) applied in any direction.The concentrated and uniform loading conditions shall not be required to be applied simultaneously.
E. Guards shall be designed and constructed for:
A. A concentrated load of 200 lbs. (890 N/m) applied at any point and in any direction along the top railing member and; a uniform load of 50 lbs. per ft. (730 N/m) applied horizontally at the required guardrail height and simultaneous uniform load of 100 lbs. per ft. (1460 N/m) applied vertically downward at the top of the guardrail. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.
F. American Institute of Steel Construction (AISC), American Iron and Steel Institute (AISI) and Aluminum Association (AA) design criteria shall be the basis for calculation of member sizes and connections.
G. Wood members shall be designed in accordance with National Forest Products Association, (NFOPA), and National Design Specification for Wood Construction.

WARRANTY

A. The manufacturer shall warrant all work performed under these specifications to be free of defects for a period of one year.
B. All understructure components shall be warranted for a period of ten years.
C. Any materials found to be defective within this period will be replaced at no cost to the owner. This warranty shall not include replacements required by Acts of God, war, vandalism, flood, fire, calamity or deliberate abuse or misuse of the equipment.

ACCEPTABLE MANUFACTURERS

A. All seating shall be VersaTract Telescopic Seating System as manufactured by Irwin Seating Company - Telescopic Division, Altamont, IL 62411 or equal, subject to prior approval and strict compliance with these specifications.

MATERIALS

A. Seating Area: wall attached, electrically operated.
B. Dimensions: See construction drawings.
C. Overall height: See construction drawings.
D. Open depth: See construction drawings.
E. Closed depth: See construction drawings.
F. Row Spacing: See construction drawings.
G. Rise per row: See construction drawings.

FABRICATION

A. Understructure System:
    1. Steel supports and rolling frames shall be constructed from formed steel of the size and shape necessary to support the design loads. All support bracing shall begin at Row 2 and be of diagonal or "knee" type for rigidity. Diagonal bracing to be minimum 1 1/2” x 1 1/2" 14-gauge square tubing. Bracing fabricated from open-sided channel, angle iron or flat strap "X" type bracing is unacceptable.
    2. Wheels shall not be less than 5" diameter x 1 3/8" non-marring soft rubber face to protect wood or synthetic floor surfaces. Each operating row shall have a minimum of 6 wheels.
    3. Each fully skirted wheel channel shall be formed 12-gauge steel and continuously in contact with adjacent channels by means of an Integral Alignment System (IAS) and include nylon glides to eliminate any metal to metal contact. The IAS maintains proper alignment between adjacent wheel channels for smooth and consistent operation while eliminating the potential for accidental row separation. Wheel channel alignment systems with metal to metal contact requiring periodic lubrication or that utilizes a guide rod system that can be bent or damaged will not be acceptable.
    4. Each cantilever arm shall be triple-formed 10-gauge steel, securely welded to the post assembly and include a nylon cantilever pad to ensure smooth operation. The cantilever pad shall also provide a firm base when in the occupied position and provide a solid feel when walked on.
    5. Vertical columns shall be high tensile steel structural tube to meet design criteria. Minimum column size to be 2” x 3” 14-gauge structural tube, welded to a 2’ wide wheel channel using 360 degrees of weldment.
    6. Deck support members shall be double formed 14-gauge steel and connect the front nosing and rear riser members. Each deck support shall include a unique dual-purpose roller that provides smooth support during operation. The deck support roller shall also include a 3/4” wide shoulder that’s encapsulated by the deck support on the row above in order to maintain proper upper alignment while delivering consistent, repeatable operation.
B. Seat Systems:
    1. Infinity Seat: Supply plastic modular 18” individual seats in either 10” deep models. Seating to be scuff resistant injection molded high density polyethylene plastic.
        a. Seat modules supplied shall be of a high aesthetic design using multiple textures, style lines and a waterfall front. The rear of the seat shall be slightly curved to eliminate the straight line appearance and include a moderate seat contour and texture to enhance spectator comfort.
        b. Seating design shall be molded to achieve a finished end appearance without the use of end caps. The rear of the seat shall include a smooth wall allowing for the deck to be easily swept clean without obstruction.
        c. Seat heights shall be maintained at a minimum of 16 3/4". Lower seat heights which detour from spectator comfort will not be accepted.
        d. Foot space shall be maximized for spectator comfort and provide a minimum of 22” when measured with a 10” module and 21” with a 12” module.

e. Each seat to be designed with the capability of using seat numbers and row letters at the aisle locations. Seat numbers to be stylishly designed using a radius corner to enhance the aesthetic value of the seat. Seat numbers and row letters shall be recessed into the seat to protect against any vandalism.
f. Select seating colors from manufacturer's 15 standard colors. Custom colors available as an option.
g. Securely fasten each seat to the nose beam using a 10-gauge formed steel bracket and locking hardware. Adjacent seating shall be interlocked together along the full perimeter eliminating any fore or aft movement or the potential of any pinching hazard.
h. Seat modules shall be designed to support a uniform load of 600 lbs per seat and a concentrated load of 150 lbs over 4 square inches.

C. Deck System:
1. Panelam decking shall have a 0.030 (30 thousandths) high density polyethylene overlay, permanently bonded over 5-ply structural plywood in strict compliance with U.S. Product Standard PS 1 requirements. Finish thickness to be 5/8". Plywood shall be supported along the front and back edge for maximum rigidity and designed in a manner that allows 3 plies to run front to back for increased deck strength. Each plywood panel shall be connected using a tongue and groove splice leaving the deck clean and free of any tripping or cleaning obstructions. Decking shall be secured in place by the encapsulation of the rear riser and mechanical fasteners along the front edge. Panelam to be selected from manufacturer's standard colors.

D. Nosing:
1. Nosing shall be one piece, formed, 14-gauge steel with a minimum G-60 pre-galvanized finish.

E. Rear Risers:
1. Rear riser shall be one piece, formed, 14-gauge steel with a minimum G-60 pre-galvanized finish.

F. Finish: For rust resistance in standard conditions all painted surfaces shall be finished in textured Epoxy Powder Coated Semi-Gloss Black.

ACESSORIES

A. Aisles shall be footrest level 24 inches wide to provide _9_ aisles. Aisles at the footrest level shall include non-slip treads on the top front edge.

B. Intermediate aisle steps shall be provided. Steps are permanently attached closed design. Steps shall be constructed from 14 ga. steel, finished in a Black powder coated epoxy, and designed to eliminate any possible toe catch between the top of the intermediate step and the bottom of the nose beam per ADA or other applicable codes. Front step shall be removable and interlock to the front row eliminating any possibility of accidental disengagement, and store on the front row when not in use.

C. Aisle handrails.
1. Smart Rail aisle handrails shall be provided for 22" to 26" row spacing. Aisle railings shall quickly and easily rotate 90 degrees to the locked position and store parallel to the front of the aisle. Railings that require removal from the pocket or the use of tools for storage will not be acceptable. Aisle railings shall be an individual rail design, located on every other row starting at row two (2). Railing to be constructed of 1 1/2" 11 ga. round steel tubing, finished in a textured powder coated epoxy. For safety, railings designed without a full return of the handrail will not be acceptable.

D. Wheel Chair Seating Areas.
1. Recoverable wheel chair spaces shall be provided at the section joint location or section length as shown on plans. An integral support on row two shall be provided to eliminate structural damage to the understructure during the operation and use of the system. Recoverable seating areas do not require front railings for support.

E. End rails.
1. End rails of the self-storing type, finished with textured epoxy powder-coated black enamel, shall be provided at the open ends of the group. End rails shall start at row three and be constructed from 1" square tubing to meet all national building codes. Railings with flexible uprights that can be expanded beyond the 4" sphere are not acceptable.

F. End panels of plywood and supports shall be provided to enclose the open ends of the group in the closed position. End panels shall enclose the space between the wall and the back of the self-storing end rails. End panels to be constructed from Panelam or clear coat plywood.

G. Vinyl end curtains shall be provided to limit unauthorized access to the underside of the telescopic system. Curtain to be one piece design shaped to follow the angle of the telescopic unit in the open position and constructed of a sturdy vinyl material with sewn-in grommets for attachment. Color to be selected from manufacturer's standard selection.

H. Scorer's table shall be 8' long x 18" wide and feature a speckled grey blow molded top. Table to include cantilevered folding legs designed to fit within the seating row without the need for mounting sockets, or for use on the floor in front of the stand.
J. Seat numbers and row letters shall be supplied in a contrasting, but complementary color for easy seat identification. Layout of numbering to be coordinated with the architect/owner.
K. Supply iScape custom graphics.
    1. Supply custom end seat graphics of school logo or mascot at each aisle seat location. Each graphic shall include full digital printing using a 4 color process, and be sized to follow the entire seat profile. Print-ready artwork to be supplied by the architect/owner.
    2. Graphic vinyl end curtains with custom graphics shall be provided to limit unauthorized access to the underside of the telescopic system. Curtain to be one piece design shaped to follow the angle of the telescopic unit in the open position, and constructed of a sturdy vinyl material with sewn-in grommets for attachment. Each curtain shall include full custom graphics with print-ready artwork as supplied by the architect/owner.
L. Seat level rear filler panels up to 21" deep used to close openings between top row seat and wall. Provide adequate support structure below the closure panel that will allow for spectators to safely stand in this area. Closure panel to match the deck surface.
N. Infinity Seat Spacer.
    1. Infinity seat spacers shall be supplied as indicated on architectural drawings. Seat spacers to be **3"** wide with a contoured shape matching that of the adjacent seat modules, and available in 15 matching or contrasting standard colors. Seat spacers to be constructed using the same material, design, durability and attachment method as the Infinity seat module.
O. Portable operator handle with tug frames for use in assisting manually operated bleachers shall be supplied. "T" frame handle to allow two operators to open and close bleacher sections from a standing position.
P. Full width back panels for portable, forward fold or freestanding units shall be provided. Panels shall extend to 8' above the floor with a sturdy vinyl curtain material extending to the underneath side of the last row seat. Back panels to be constructed from Panelam or clear coat plywood. Aluminum trip to be supplied for finishing all exposed ends. Curtains to be selected from manufacturer's standard colors. Plywood shall be supported along the front and back edge for maximum rigidity.
Q. Rear rails, 42" high for portable, forward fold or freestanding units with tubular supports to fill design criteria, shall be provided. Rails to be mounted behind the rear seat and extend the full length of the seating section. Railings to be finished in textured powder coated epoxy.

PROPULSION SYSTEM

A. FRICTION POWER: Integra Drive System (IDS) shall be furnished on each seating group to open and close the telescopic units. Each individual section shall include 2 IDS friction drive systems integrated into the first moving row of understructure to achieve smooth and efficient operation. Operation of the seating shall be accomplished with the use of a walk along pendant control.
    1. Each IDS power system shall include large 6 1/2" diameter friction rollers to develop tractive force adequate to open and close the system. Each roller to include non-marring 1/2" thick rubber covering.
    2. Electrical motors for each section shall be heavy-duty and high efficiency gear reduction motors. The shaft diameter for the gear motor and rollers shall be a minimum of 1" and be connected by a 1" schedule 40 drive shaft.
    3. All roller chain and sprockets used throughout the drive system shall be a minimum of #40 in size. Each drive unit shall be designed to include a safety shroud around the chain and sprocket for overall safety.
    4. The power units shall develop tractive forces adequate to operate the seating units under normal conditions but inadequate to operate should significant obstacles be encountered.
C. Manufacturer shall provide all wiring from power source within bleacher seating including pendant control. Removable pendant control shall be handheld with forward and reverse button, plugging into a single receptacle. Electrical contractor shall provide a 60 HZ power source (as specified below) behind each group of seating. Amperage to be as specified by seating manufacturer depending on the number of power units required. For wall-attached installations, power source to terminate in a surface mounted junction box above floor. For reverse units, power source to terminate in a junction box, flush mounted under first seating row in center of group. Electrical contractor shall perform the connections to the seating equipment at the junction box. All electrical parts and wiring shall be installed in complete accord with the National Electric Code. U.L. Listing FHJU.E479554.
Supply power system with 208/230V, 5 wire 3-phase system.

REVIEWS AND APPROVALS

A. Shop drawings shall be approved and job site field measurements taken prior to installation and telescopic gym seating shall be installed in conformance therewith.

INSTALLATION

A. The installation of the telescopic gym seating will be handled directly by the manufacturer or by a factory authorized installation subcontractor qualified to perform the installation functio

PROTECTION

A. The manufacturer’s representative shall transmit instructions in both operation and maintenance to the owner.
B. Maintenance and operation of the telescopic gym seating shall be the responsibility of the owner or his duly authorized representative, and shall include the following:
    1. During operation of the telescopic gym seating, the opening and closing shall be supervised by responsible personnel who will assure that the operation is in accordance with the manufacturer's instructions.
    2. Only attachments specifically approved by the manufacturer for the specific installation shall be attached to the telescopic gym seating.
    3. An annual inspection and required maintenance of all telescopic gym seating shall be performed to assure safe conditions. At least bi-annually, the inspection shall be performed by a Professional Engineer or factory service personnel.
C. Irwin Telescopic Seating Company constantly strives to improve its product and manufacturing methods; therefore, it reserves the right to make changes without notice which, in the opinion of Irwin Seating Company, shall improve the product.

END OF SECTION

SECTION 16623 - BASKETBALL EQUIPMENT (FRONT FOLDING, MOTORIZED)

SUMMARY

A. Section Includes

16. Ceiling Suspended, Up to 32' Attachment, Single Drop Basketball Equipment
    a. J849-FFFB, Forward Folding, Front Braced.
17. Basketball Backstop Winches
    b. TW-2000, TorkWinch Electric Basketball Winch
    c. PL-1000, Posilok Safety Strap
18. Basketball Backstop Backboards
    a. GBRUB-42, 42" x 72" Unbreakable Rectangular Glass Backboard
19. Basketball Backstop Goals
    b. GBA-342A, Competitor Scholastic Breakaway Goal, 42" Boards
20. Basketball Backstop Height Adjusters
    a. AHA-XX, Manual Aluminum Height Adjuster
21. Basketball Backstop Control System
    a. KS-13, Key Switch
22. Basketball Backstop Edge Padding
    a. MBBP-6, Safe-Pro™ Bolt-On Edge Padding, 72" Wide Backboards

REFERENCES

A. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

SUBMITTALS

A. Comply with SUBMITTALS Section
23. Design Data: Submit manufacturer’s design data, including loads to be transmitted to building structural members with requirements of any additional structure needed.
24. Field Test Reporting: Submit manufacturer’s certified destructive test reports completed by an accredited independent testing laboratory, indicating compliance with any specified factor or safety.
25. Shop Drawings: Submit manufacturer’s shop drawings, including elevations, plans, sections, layouts, component locations, dimensions, tolerances, fabrication details, materials, finish, quantities, hardware, fittings, electrical wiring diagrams, additional structure needed details, and method of attachment.
26. Product Data: Submit manufacturer’s product data, including proposed components, fabrication, finish, and materials.
27. Samples: Submit manufacturer’s color samples.
    a. Basketball Backboard Edge Padding
    b. Basketball Backstop Powder Coat
28. Installation, Operation, and Maintenance Instructions: Submit installation, operation, and maintenance instructions including detailed step-by-step installation, troubleshooting, general operation instructions, and any recommended routine maintenance.
29. Manufacturer's Project References: Submit manufacturer's list of recently completed projects. To be included is project name, location, name of architect, and description of equipment installed.
30. Warranty: Submit manufacturer’s guarantees and warranty information on a system and/or component.

QUALITY ASSURANCE

A. Manufacturer Qualification: All components to be provided from a single source manufacturer.

B. Installer Qualification: All components to be installed by a trained and qualified installer approved by the manufacturer.
C. Welding Certification: All welding to be completed by a certified welder in accordance to the American Welding Society (AWS), D1.1, “Structural Welding Code – Steel.”
D. Regulatory Requirements: Gymnasium equipment shall conform to the latest rules and regulations:
    1. National Federation of State High School Associations (NFSHSA)
    2. International Basketball Federation (FIBA)
    3. National Collegiate Athletic Association (NCAA)
    4. National Basketball Association (NBA)
    5. Women's National Basketball Association (WNBA)

DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver basketball system equipment in original manufacturer’s containers, with all containers grouped together, with labels clearly labeling the manufacturer and contents. Upon delivery, immediately inspect delivery for any missing containers or damage. Any damage or defects shall be noted and reported to the Owner’s Representative.
B. Storage: Store containers in a clean, dry indoor location.
C. Handling: Protect materials and finish during handling and installation.
D. Replacements: If necessary, replacements shall be immediately re-ordered, so as to minimize any conflict with the construction schedule.

WARRANTY

A. Wall mounted basketball structure shall be guaranteed against defects in material and workmanship for a period of ten (10) years. Other components may be covered by their own extended warranty.
B. Ceiling suspended basketball structure shall be guaranteed against defects in material and workmanship for a period of twenty-five (25) years. Other components may be covered by their own extended warranty.

MANUFACTURER

C. Jaypro Sports, LLC. 976 Hartford Turnpike, Waterford, Connecticut 06385. Toll Free 800-243-0533. Phone 860-447-3001. Fax 800-988-3363. Email info@jaypro.com. Web www.jaypro.com.
D. SUBSTITUTIONS PERMITTED. Provide full product submittal for architect’s review and approval prior to award of contract.

CEILING SUSPENDED BASKETBALL EQUIPMENT, UP TO 32' ATTACHMENT

A. J849-FFFB, Single Drop, Forward Folding, Front Braced.
    6. Type: Singe drop, forward folding, front braced with attachment up to 32'.
    7. Main Mast Stem: 6-5/8" O.D. 11-gauge structural steel tube.
    8. Anti-Sway Braces: 2-3/8" O.D. 10-gauge structural steel tube with precision cut ends for maximum weld area. Sway braces shall attach to the mast no higher than 36" above the backboard for maximum stability.
    9. Auxiliary Braces: 1.90" O.D. 13-gauge steel tube braces for increased stability for attachment elevation exceeding 28'.
    10. Mast Header: 5" heavy duty structural c-channel.
    11. Mast Construction: Fully welded construction in accordance with American Welding Society (AWS), D1.1 "Structural Welding Code - Steel." Bolt-together masts are not acceptable.
    12. Front Brace: Operates with 2-3/8" O.D. 12-gauge structure steel tube with heavy duty folding knuckle joint.
    13. Knuckle Joint: Locks unit into playing position.
    14. Fittings and Support Structure: Backstop supported from existing structure with capped 3-1/2" O.D. 11-gauge structural steel tube with heavy duty precision formed and/or welded steel support fittings.
    15. Swing Hinge Fittings: Backstop suspended from 3-1/2" O.D. support pipe by 7/8" forged eyebolts with press fit oil-impregnated bronze bearings. 2" of adjustability provided for precise plumbing of backstop during installation.
    16. Weight Lock: Mast centerline offset 2" forward of swing hinge fittings to ensure backstop securely weight locks the unit into the playing position.

17. Hoist Cable: 1/4" Diameter galvanized aircraft cable with 7000 lbs ultimate break strength. Cable disengages knuckle joint, allowing brace to fold.
18. Goals: Mounted directly through the backboard to a direct goal mount which is secured to the 6-5/8" main mast stem. Direct goal mount eliminates any strain on backboard should any player hang on rim.
19. Finish: All metal parts, pipes, and fittings to be powder coated
20. Compliance: Backstop system meets all NCAA and NFSHSA regulations and requirements.

BASKETBALL BACKSTOP WINCHES

A. TW-2000, TorkWinch 1 HP Electric Winch
    21. Type: Fully enclosed, direct drive winch designed to hold backstop at any position during raising or lowering. Winch is maintenance free with no oil, belts, or chains.
    22. Motor: 1 HP, instantly reversing, 110 volt, single phase electric torque motor utilizing 3-wire control system.
    23. Frame: Precision interlocking steel frame for high rigidity and precise alignment.
    24. Hoist Cable: 1/4" 7 x 19 galvanized aircraft cable with 7,000 pounds ultimate break strength.
    25. Rope Pressure Roller: Torsion spring tensioning roller to ensure cable tracks properly in grooves even under slack cable conditions.
    26. Cable Drum: Cast aluminum grooved for 1/4" aircraft cable to facilitate smooth take-up of cable and proper spooling. Supported in large diameter ball bearings.
    27. Limit Switches: Integral adjustable upper and lower limit switches making the sett
    28. Mounting: Universal type mounting bracket, mounted upside down or right side up, with cable pull from any one of three different directions.
    29. Controls: Specify type of control in subsequent paragraph.
    30. Warranty: Limited 1 year warranty.
B. PL-1000, Posilok Safety Strap
    1. Application: For use with 1400 Fold-Up Wall Mounted Backstop and all Ceiling Suspended Folding Backstops.
    2. Lock: Inertia sensitive to automatically lock basketball backstop in position at any time during raising, lowering, or being held in the storage position. Initiation of locking mechanism occurs when a sudden increase in either tension or speed shall occur.
    3. Reset: Fully automatic reset mechanism requiring no poles, ropes, levers, or buttons.
    4. Telltale Indicator: Breakaway loop sewn into strap containing bright colored warning label for notification when safety belt has been called into action.
    5. Warranty: Limited 1 year warranty.

BASKETBALL BACKSTOP BACKBOARDS

A. GBRUB-42, 42" x 72" Unbreakable Rectangular Glass Backboard
    6. Application: For use with goals with 4" (vertical) x 5" (horizontal) mounting centers. Meets all NBA, WNBA, NCAA, and NFSHSA regulations.
    7. Construction: 1/2" tempered glass cushioned within shock absorbing vinyl gasket. Frame constructed of high strength aluminum channel with engineered lower reinforced steel member.
    8. Frame Perimeter: Clear anodized anti-glare aluminum channel outer frame.
    9. Goal Mount: Designed to transfer impact load on goal directly to support structure, without imparting any stress on the glass.
    10. Border and Target: Official white color permanently fused into the face of the glass.
    11. Warranty: Limited lifetime warranty against breakage.

BASKETBALL BACKSTOP GOALS

A. GBA-542, Collegiate "Shot" Pigtail Goal, 42" Boards
    12. Application: For use with GBRUB-42 and GBRUB-54 backboards with 5" x 4" mounting pattern. Meets all NBA, WNBA, NCAA, and NFSHSA regulations.
    13. Rim: 5/8" diameter steel rod braced by 3/16" die cut steel bracing welded to the underside of ring.
    14. Net Attachment: 12 pigtail loop attachments on underside of goal ring.
    15. Reinforced Pressure Release Mechanism: Automatically releases rim when static force exceeding the release setting is applied to the top of the goal at point most distant from the backboard. Reinforced heavy duty release mechanism to instantaneously release back to playing position with increased wearability.

16. Settings: Factory pre-set to 180 lbs - 230 lbs with in-the-field adjustability to comply with NCAA recommendation rebound characteristics of non-moveable ring.
17. Cycle Testing: GBA-542 goal cycle tested for 50,000 cycles with a breakaway force set at 230 lbs. Goal maintained structural integrity and rebounding features while still providing the breakaway sensation throughout cycle testing and post test. Test report furnished upon request. Goals "not cycle tested to 50,000 cycles" not considered equal.
18. Net: White anti-whip nylon net.
19. Finish: Official durable orange powder coat.
20. Warranty: Limited 7 year warranty.

BASKETBALL BACKSTOP HEIGHT ADJUSTERS

A. AHA-XX, Manual Aluminum Height Adjuster
    21. Type: Mechanism for manually adjusting height of backboard and goal.
    22. Adjustment Range: Goal position from 8' to 10' above finished floor. Height indicators located on side of aluminum frame to visually determine height settings.
    23. Construction: Lightweight, interlocking aluminum alloy extrusions with UHMW-polyethylene jib strips. 1/2" aluminum alloy plates welded to extrusions to allow universal mounting to any drop and/or bank. Welded construction in accordance with American Welding Society (AWS), D1.2 "Structural Welding Code - Aluminum."
    24. Operation: 3/4" acme thread rod secured within two bronze bushings driven by manual hand crank. Operation of height adjuster done from the floor with supplied crank.
    25. Size and Weight: Height adjuster shall not exceed 14" in width or 55 pounds in weight.
    26. Finish: Durable black powder coat.
    27. Warranty: Limited 1 year warranty.

GYM EQUIPMENT GROUP CONTROL SYSTEMS

A. KS-13, Momentary Wall Mounted Key Switch
    28. Wall Mounted Key Switch: Operate equipment with 3 position, momentary contact wall mounted key switch.
    29. Momentary Switch: Spring loaded with automatic return to OFF position.
    30. Cover Plate: Independently flush mounted stainless steel cover plate.
    31. Equipment: Key switch identical for operation of basketball backstops, gymnasium curtains, mat hoist systems, electric height adjusters, batting cages.
    32. Warranty: Limited one (1) year warranty.

BASKETBALL BACKSTOP EDGE PADDING

A. MBBP-6, Safe-Pro Bolt-On Edge Padding
    33. Application: Recommended for all 72" wide glass backboards. Pads meet all NCAA and NFSHSA rules.
    34. Type: Bolt-on, molded self-skinning urethane two-piece design.
    35. Protection: Padding shall cover entire bottom edge and extend 17-3/8" up the sides. Padding shall not be less than 2" thick.
    36. Construction: Steel reinforced plates facilitate attachment of padding with bolts. Interlocking steel pin connectors provided at match point between two halves to provide alignment and eliminate sagging underneath goal.
    37. Color: Architect to select based on standard colors.
    38. Warranty: Safe-Pro Bolt-On Edge Padding covered by 8 year warranty.

EXAMINATION

A. Examine areas of installation for any conditions that would affect the installation of the gymnasium equipment. If conditions exist that prohibits or hinders installation, notify the Architect and do not proceed with the installation until conditions have been resolved.

INSTALLATION

A. Install equipment in accordance with manufacturer’s instructions.
B. Install equipment level, straight, accurate in accordance with the supplied drawings and at the correct locations specified.
C. Install equipment with supplied hardware, fittings, and components.

D. For electrically operated equipment, install electrical power in accordance with Section 26, Electrical.
E. For electrically operated equipment, install control system such that the operation of the equipment can been seen in clear sight.

ADJUSTING

A. Adjust gymnasium equipment as needed to function properly and to ensure accurate position in both stored and in-use positions.
B. For electric powered gymnasium equipment, adjust upper and lower limit switches as need to achieve desired heights.

CLEANING

A. Clean gymnasium equipment in accordance with manufacturer's instructions.
B. Do not use harsh cleaning methods or supplies that may alter the finish of the gymnasium equipment.
C. Remove temporary labels and protective coverings.

DEMONSTRATION

A. Demonstrate complete operation of the gymnasium equipment to the Owner Representative.
B. Furnish Owner Representative of operation procedure and required maintenance.
C. Furnish Owner Representative with means necessary to operate gymnasium equipment.

PROTECTION

A. For installations of gymnasium equipment with finished floor already installed, provide means of protecting the floor to prevent damage.

END OF SPECIFICATION SECTION

GEOTECHNICAL REPORT

REPORT OF SUBSURFACE EXPLORATION

Delmarva Christian Academy

Building and Pavement Expansion
Georgetown
Sussex County, Delaware

November 10, 2023

Prepared For:

Delmarva Christian School
c/o Pennoni & Associates, Inc.
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Attn: Mr. Mark Davidson

Prepared By:

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REPORT OF SUBSURFACE EXPLORATION
DELMARVA CHRISTIAN ACADEMY
GEORGETOWN
SUSSEX COUNTY, DELAWARE
NOVEMBER 2023

INTRODUCTION

A school expansion is proposed at the Delmarva Christian Academy in Georgetown, Delaware. Geo-Technology Associates, Inc. (GTA) was retained by Delmarva Christian School to perform a preliminary geotechnical exploration of the site. The scope of this study included field exploration, review a of site plan, limited laboratory testing and engineering analysis. The field exploration consisted of 22 Standard Penetration Test (SPT) borings performed within the development area. A preliminary site plan titled *Delmarva Christian* prepared by BGW Architects (BGW) and dated June 12, 2023 was referenced for this report. A report regarding the stormwater management (SWM) portion of the project will be submitted separately.

SITE CONDITIONS

Referring to the attached Figure No. 1, Site Location Plan, the site is situated at the northeast corner of Sussex Pines Road and Zoar Road in the Georgetown area of Sussex County, Delaware. The project site is situated within an irregular shaped parcel totaling approximately 54-acres and predominantly consists of the existing school and parking lot, sports fields, and mature woods. Residential lots border the site to the west, agricultural fields border the site to the south, and mature woods border the site to the north and east. Topographically, the property is relatively flat, with the ground surface at the exploration locations ranging from Elevation 45 to 47 Mean Sea Level (MSL), as determined by Pennoni Associates, Inc.

PROPOSED CONSTRUCTION

The proposed construction will consist of an approximately 87,000 square foot, mutli-story addition to the existing school building. Also proposed are new athletic fields, associated drive lanes and parking lots, SWM facility areas and ancillary buildings. The main building will have a new total footprint of approximately 150,000 square feet. A shallow spread foundation system and ground supported slabs are anticipated. Foundation loads provided by the structural engineer are as follows:

Area 1: Upper School Classroom Area

- Typical interior column loading at Classroom area
  - +/- 75kips to 80 kips
- Typical exterior column loading at Classroom area
  - +/- 38 kips to 40 kips
- Typical corner column loading at Classroom area
  - +/- 20 kips to 25 kips
- Typical Exterior Wall Loading
  - +/- 1.5 kips / ft to 2.0 kips / ft

Area 2: Upper School Gymnasium Area

- Typical exterior column loading at Gymnasium
  - +/- 70 kips
- Typical interior column loading at Gymnasium
  - +/- 85 kips
- Typical corner column loading at Gymnasium
  - +/- 40 kips
- Typical Exterior Wall Loading
  - +/- 2.5 kips / ft to 3.0 kips / ft

Area 3: Industrial Arts Building

- Typical exterior Column Loading
  - +/- 40 kips
- Typical corner Column Loading
  - +/- 20 kips to 25 kips
- Typical wall loading
  - +/- 1.0 kips / ft to 1.5 kips / ft

Area 4: Early Learning Center

- Typical Exterior Wall Loading (Bearing Wall)
  - +/- 2.0 kips / ft to 2.8 kips / ft
- Typical Interior Wall Loading (Bearing Wall)
  - +/- 1.8 kips / ft to 2.2 kips / ft

The building will be served by public water and sewer. While the grading scheme has not been established, GTA assumes that fill to cut on the order of one foot or so will be needed within the building pad and pavement areas to achieve final grades, with substantial cut anticipated for the SWM facility areas.

SITE GEOLOGY

According to the Geologic Map of the Harbeson Quadrangle, Delaware (2011) published by the Delaware Geological Survey, the study area is within the Coastal Plain Physiographic

Province. Coastal Plain sediments below the surficial deposits exposed in the site area were generally deposited in commonly estuarine environments of Tertiary geologic age. The Late Pliocene deposits are designated as the Beaverdam Formation and typically consist of "…very coarse sand with pebbles to silty clay. The predominant lithologies at the land surface are with to mottled light-gray and reddish-brown, silty to clayey, fine to coarse sand." Please review the referenced map for further details regarding this geologic unit.

SUBSURFACE EXPLORATION

The field exploration consisted of 22 Standard Penetration Test (SPT) borings, designated as B-1 through B-13, performed within the vicinity of the proposed building footprints and P-1 through P-9 located within the pavement areas. These borings were performed during September 2023, to depths of approximately 6 to 30 feet below the existing ground surface. An ATV mounted Geoprobe 7822 DT drill rig was used to drill the SPT borings.

The boring locations were performed at the approximate locations shown on the Exploration Location Plan, presented as Figure 2 in Appendix A. The exploration locations were selected by GTA and staked with elevations determined by Pennoni Associates, Inc. The exploration locations indicated on the plan should be considered approximate.

Standard Penetration Testing was performed in the SPT boreholes, with soil samples obtained at 2-foot intervals in the upper 10 feet and then at 5-foot intervals thereafter. Standard Penetration Testing involves driving a 2-inch O.D., 1 ⅜ -inch I.D. split-spoon sampler with a 140-pound hammer free-falling 30 inches. The SPT N-value, given as blows per foot (bpf), is defined as the total number of blows required to drive the sampler from the 6 to 18 inches below the sampling depth. Longer term water level readings were recorded one to seven days after completion. Borings were backfilled after completion of the water readings.

Samples obtained from the borings were returned to GTA's office for visual classification by GTA personnel. Selected samples recovered from the field exploration were submitted for limited laboratory analysis. The soil layers were classified in accordance with the Unified Soil Classification System (USCS) and American Association of State Highway and Transportation Officials (AASHTO) classification systems. Classifications provided on the logs are visual

descriptions, supplemented by available laboratory data. The exploration logs are presented in Appendix B. The logs represent our interpretation of the field data based on observation and limited soil classification tests. The interfaces indicated on the logs may be gradual.

SUBSURFACE CONDITIONS

The explorations generally confirm the description of subsurface conditions provided in the *SITE GEOLOGY* section of this report. The borings encountered a 5 to 18-inch thick topsoil layer, with the exception of Borings B-6 and B-7 which encountered a 7-inch thick pavement section. Below the topsoil, Borings B-3, B-5, and B-8 through B-10, encountered fill extending to depths of approximately 4 feet below the ground surface and consisted of Silty SANDs (USCS: SM; AASHTO: A-2). The densities of the fill were loose to medium dense based on SPT N-values of 6 to 20 bpf.

Beneath the topsoil/pavement section/fill layers, the explorations encountered native soils visually classified as consisting of Poorly-graded SANDs with Silt (USCS: SP-SM; AASHTO: A-2/A-3), Poorly-graded SANDs (SP; A-3), Silty SANDs (SM; A-2), and Clayey SANDs (SC; A-2-6/A-4/A-6). The relative densities of the granular soils were very loose to medium dense based on SPT N-values of 2 to 28 bpf.

Water was encountered at completion at depths of 6 to 10 feet below the ground surface, with exception of Explorations P-1 through P-9, which were dry to depths of 6 feet below the ground surface. Longer term water levels (recorded one to seven days after completion) were encountered at depths of 6 to 10 feet below the existing ground surface corresponding to approximate Elevation 36 to 39 Mean Sea Level (MSL) and averaging at Elevation 37½ MSL. Borings P-1 through P-9 were dry to 6 feet when long terms readings were taken.

The groundwater levels can be expected to fluctuate with seasonal changes, precipitation, and other factors such as development activity. Additionally, perched water conditions develop in granular soils overlying fine-grained and/or denser soils during the “wet season” and during heavy periods of precipitation. Please refer to the Idealized Subsurface Profiles provided in Appendix A and the exploration logs provided in Appendix B for further information.

LABORATORY TESTING

Selected samples obtained from the borings were tested for grain-size analysis, Atterberg Limits and natural moisture content. The grain-size analysis and Atterberg Limits testing were performed to identify the Unified Soil Classification System (USCS) and American Association of Highway and Transportation Officials (AASHTO) designations for the soil. The results of testing are as follows:

SUMMARY OF LABORATORY TESTING

EXPLORATION NO.	DEPTH (FT.)	USCS CLASSIFICATION	AASHTO CLASSIFICATION	LL (%)	PI (%)	NM (%)
B-2	2 – 4	Clayey SAND (SC)	A-4(0)	23	9	18.5
B-10	6 – 8	Clayey SAND (SC)	A-2-6(1)	30	13	25.5
P-4	1 – 4	Clayey SAND (SC)	A-4(1)	26	10	8.7

Note: LL=Liquid Limit PI=Plastic Index NP=Non-plastic NM=Natural Moisture Content

A composite, near-surface sample was tested for moisture-density relationships in accordance with the Modified Proctor (ASTM D-1557) method for use in evaluating the suitability of these soils for reuse as fill. The sample was also subjected to California Bearing Ratio (CBR) testing for use in evaluation of pavement subgrade supporting quality. Results of these tests are summarized in the following table.

SUMMARY OF COMPACTION and CBR DATA
(ASTM D 1557, the Modified Proctor; ASTM D 1883, CBR)

EXPLORATION NO.	DEPTH (FT)	MAXIMUM DRY DENSITY (PCF)	OPTIMUM MOISTURE (%)	NATURAL MOISTURE (%)	CBR AT 95% COMPACTION (%)
P-4	1 – 4	124.4	10.7	8.7	10.1

Please refer to the laboratory test results included within Appendix C for additional information.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the results of this study, it is our opinion that construction of the proposed improvements are feasible, given that the geotechnical recommendations are followed and that the standard level of care is maintained during construction. GTA's preliminary recommendations are provided in the following paragraphs.

Earthwork

Before the placement of compacted fill, areas below proposed foundations, slabs, and pavements should be stripped to remove topsoil and soft materials. After stripping, subgrade areas should be proof-rolled with a loaded tandem-axle dump truck, performed as recommended by GTA. No fill should be placed until the geotechnical engineer approves the subgrade. Wet soils near surface grade will result in poor trafficability. Positive drainage should be maintained during construction.

Most near surface on-site soils beneath the topsoil similar to the materials tested are considered suitable for reuse as structural fill material. Excavated site materials conforming to SP, SP-SM, SC or SM classifications will be suitable for reuse as structural utility backfill and in structural areas of earthwork construction. The moisture content of the tested bulk sample within two percent of the optimum moisture content. At this indicated moisture level, granular site materials similar to the sample tested will likely require limited, if any, moisture adjustment. During wet weather or when excavating below or near groundwater, delays and expense will likely be associated with reducing soil moistures to acceptable levels. Also, chemical amendment (e.g., Portland cement or Quicklime) may be considered to stabilize wet soil subgrades. The need for chemical amendment to facilitate drying and/or stabilization can best be evaluated by GTA in the field at the time of construction.

For utility and site earthwork construction, the success of these operations will be largely dependent upon the weather conditions at the time of the earthwork construction. Summer construction season is recommended to reduce the premium cost for drying. A contingency should be established for moisture adjustments and importing suitable materials. If the work is performed during wet weather, offsite borrow may be required to complete the earthwork construction.

Deeper excavations, such as for sewer utility and SWM pond installations, may encounter groundwater. Consideration must be given to dewatering and stability of excavated slopes. Contractors should provide adequate dewatering and earth support systems in utility trench excavations. Utility pipe systems below pavement and other structural areas should be backfilled using controlled, compacted fill. The backfill should be constructed as described in our site grading

recommendations. Lift thickness should be reduced to 4 inches when compacting with lightweight equipment around structures.

Off-site borrow, if required, should meet Unified Soil Classification System (USCS) designation SM, SP, SW, GM, GP, or GW and be approved by GTA. All fills should be constructed in maximum 8-inch thick loose lifts and be compacted to the following specifications:

COMPACTION SPECIFICATIONS

Structure / Fill Location	Compaction / Moisture Specification
Below foundations, floor slab subgrades and within wall backfill and pavement areas	95% of ASTM D 1557 Moisture: ± 3% of optimum
Lawn or unimproved areas	90% of ASTM D 1557 Moisture: optimum to ± 3% of optimum

A full-time soils-technician under guidance of GTA should observe fill construction. Compactive effort should be verified by in-place density testing.

Foundations

Based upon the exploration data, it is GTA's opinion that the proposed building expansion may be supported on firm soils using shallow spread footings designed for a maximum net allowable bearing pressure of 1,500 pounds per square foot (psf) for building additions and 2,000 psf for stand-alone buildings. For the building expansion at junctures between the existing building and additions, new footings should be lowered to match existing footing elevations. Minimum widths for wall footings of 16 inches and column footings of 24 inches are recommended. Settlement of 1-inch total and ½-inch differential over a 50-foot horizontal span is estimated considering the provided preliminary building loads. Exterior footings should be founded a minimum of 24 inches below the final exterior grades to provide protection from frost action.

Detailed foundation evaluations should be performed in each footing excavation prior to the placement of reinforcing steel or concrete. These evaluations should be performed by a representative of GTA to confirm that the allowable soil bearing capacity is available. The

foundation bearing surface evaluations should be performed using a combination of visual observation, comparison with the borings, hand-rod probing, and Dynamic Cone Penetrometer (DCP) testing. Footings should be concreted on the day they are excavated. If very loose or unsuitable fill materials are encountered, the footing excavations should be undercut and the subgrade should be reestablished with AASHTO No. 57 crushed stone or in accordance with GTA's recommendations in the field at the time of construction.

Floor Slabs

The ground floors should be designed as concrete slab-on-grade. GTA recommends that the concrete floor slabs supported on grade be founded on a four-inch thick open-graded stone layer covered with a polyethylene vapor retarder to interrupt the rise of moisture through the slab. Natural and compacted fill subgrades for support of the floor slabs should be tested to verify stability and compaction in accordance with GTA's earthwork recommendations prior to placement of concrete. Control joints should be provided to control shrinkage cracking of the concrete floor system. Isolation joints should be present at the location of walls, columns, and footings to allow for differential movement. A modulus of subgrade reaction value of 150 psi per inch is recommended for the design of the building slabs.

Pavements

Pavement sections should be designed based on anticipated subgrade conditions and traffic intensity. Laboratory testing of selected site soils indicated a CBR value of approximately 10 percent for the Clayey SAND (AASHTO A-4(1)) sample tested. The CBR value is based upon a relative compaction of 95 percent of maximum dry density (Modified Proctor, ASTM D-1557). Based upon the CBR value and the field conditions encountered at the borings, the site soils tested are considered to be generally good for supporting standard pavement sections.

Based on GTA's experience with similar projects, construction traffic is likely to be more significant for the design of the pavements. The pavement section thickness should be designed to reflect construction traffic and the subgrade supporting quality of the site soils. It is likely that the majority of the on-site soils will be suitable for the support of the pavement thickness sections indicated in the following paragraphs. However, subgrade materials should be carefully evaluated

prior to graded aggregate base placement and paving. Therefore, GTA recommends that the upper 12 inches of roadway subgrade be constructed of fill with the following characteristics:

PAVEMENT SUBGRADE SPECIFICATIONS

Liquid Limit	35 or less
Plasticity Index	10 or less
Maximum Dry Density	105 pcf or greater
California Bearing Ratio	10 or greater

Prior to construction of pavement sections, the pavement subgrade should be proof-rolled with a loaded tandem-axle dump truck under the observation of GTA to verify stability. Unstable or unsuitable soils should be over-excavated to a stable bearing layer. The subgrade may be re-established with approved, controlled, compacted stabilized fill. A contingency for undercutting and replacement of unsuitable materials should be provided. During prevailing wet weather conditions, the roadway subgrade may be amended using Portland cement to stabilize the roadway subgrade. GTA recommends the top 12 inches of subgrade be amended with approximately 5 to 6 percent Portland cement (Type I/II), tilled and compacted per PCA specifications. Additional laboratory testing should be performed to confirm the quantity of Portland cement at the time of construction.

For driveway and parking lot pavement construction, it is recommended that two different pavement sections be utilized to reduce the potential for pavement failures during construction. The heavy-duty pavement section can be constructed for the main driveway connecting the parking lots to the main entrance lane to Sussex Pine Road. The standard-duty pavement section can be constructed in the parking lots. It is recommended that construction traffic be limited to the heavy-duty pavement sections. The recommended preliminary pavement sections are as follows:

FLEXIBLE PAVEMENT

Pavement Components	Standard-Duty	Heavy-Duty
Bituminous Concrete Surface Course (Type C; 9.5 mm Superpave)	1½ inches	1½ inches
Bituminous Concrete Intermediate Course (Type C)*	--	1¼ inches
Bituminous Concrete Base Course (Type B; 12.5 or 19 mm Superpave)	3 inches	3½ inches
Graded Aggregate Base Course (Type B Crusher Run)	6 inches	8 inches
Approved Subgrade	12 inches	12 inches

*Placed immediately following Base Course placement.

RIGID PAVEMENT

Pavement Components	Standard-Duty	Heavy-Duty
Portland Cement Concrete*	6 inches	7 inches
Graded Aggregate Base Course (Type B Crusher Run)	4 inches	4 inches
Approved Subgrade	12 inches	12 inches

*f'c= 4,000 psi concrete provided with 7% air-entrainment; control joints, isolation joints, load transfer devices, and reinforcement as required.

When pavement areas are established to approximate pavement subgrade, the pavement subgrade material should be observed by GTA to allow for additional recommendations based upon subgrade conditions observed at the time of construction. All pavement materials and construction should conform to the State of Delaware, Department of Transportation (DelDOT), STANDARD SPECIFICATIONS, latest edition, and the Town of Georgetown standards, as applicable.

LIMITATIONS

This report, including all supporting exploration logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by GTA in connection with this project, has been prepared for the exclusive use of Delmarva Christian School pursuant to the agreements between GTA and Delmarva Christian School dated July 11, 2023 and in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is given herein. Use and reproduction of this report by any other person without

the expressed written permission of GTA and Delmarva Christian School is unauthorized and such use is at the sole risk of the user.

The analysis and preliminary recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test borings indicate soil conditions only at specific locations and times and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between test boring locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc.

The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client. This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

31231819 **GEO-TECHNOLOGY ASSOCIATES, INC.**

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

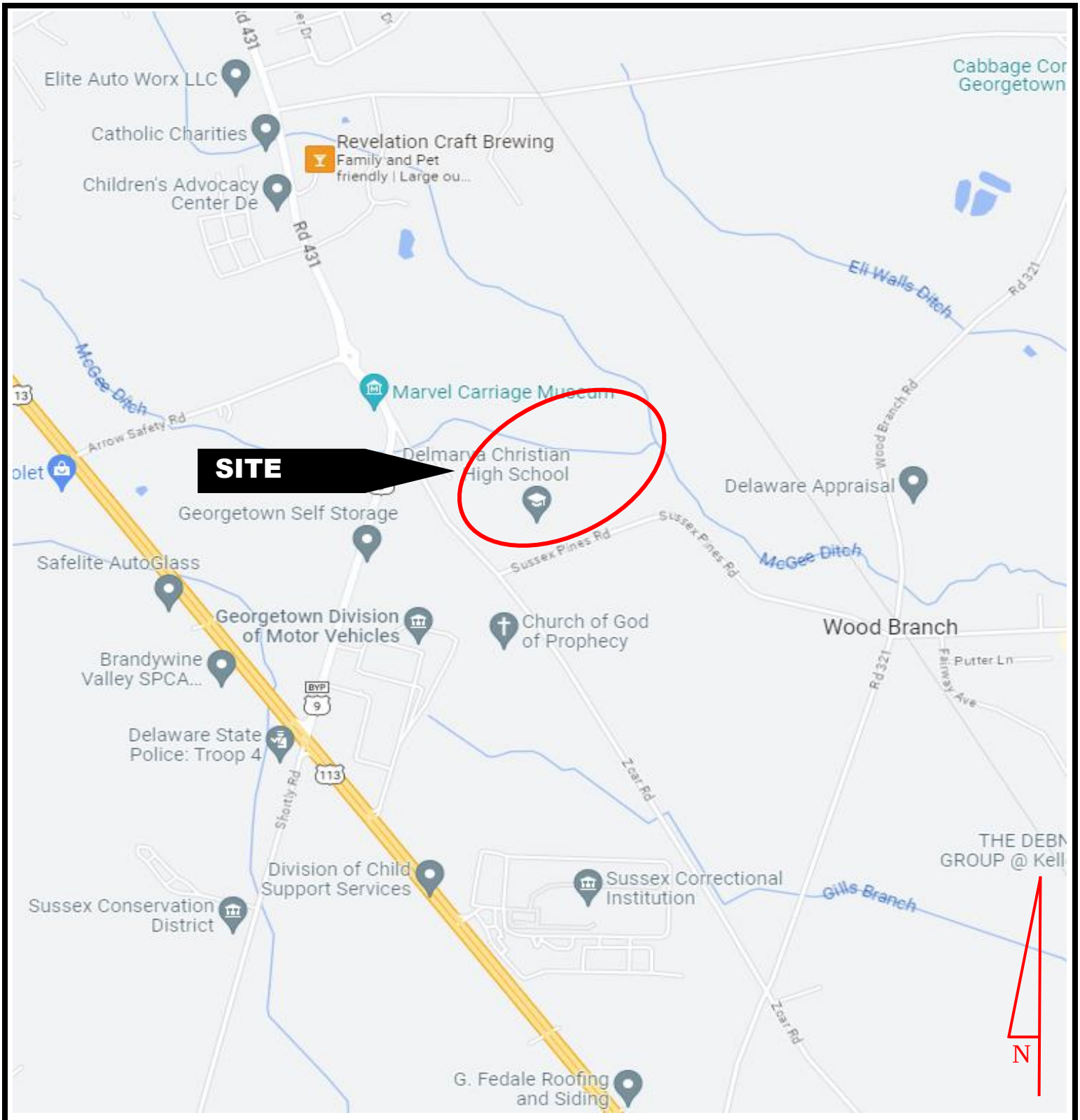
While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX A

FIGURES



Site Location Plan taken from Google Maps

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
21491 Baltimore Avenue
Georgetown, Delaware 19947
(302) 855-9761

Site Location Plan
Delmarva Christian Academy
Georgetown, Delaware

SCALE	DATE	DRAWN BY	DESIGN BY	REVIEW BY	JOB NO.
NTS	October 2023	GTA	Google Maps	GRS	31231819

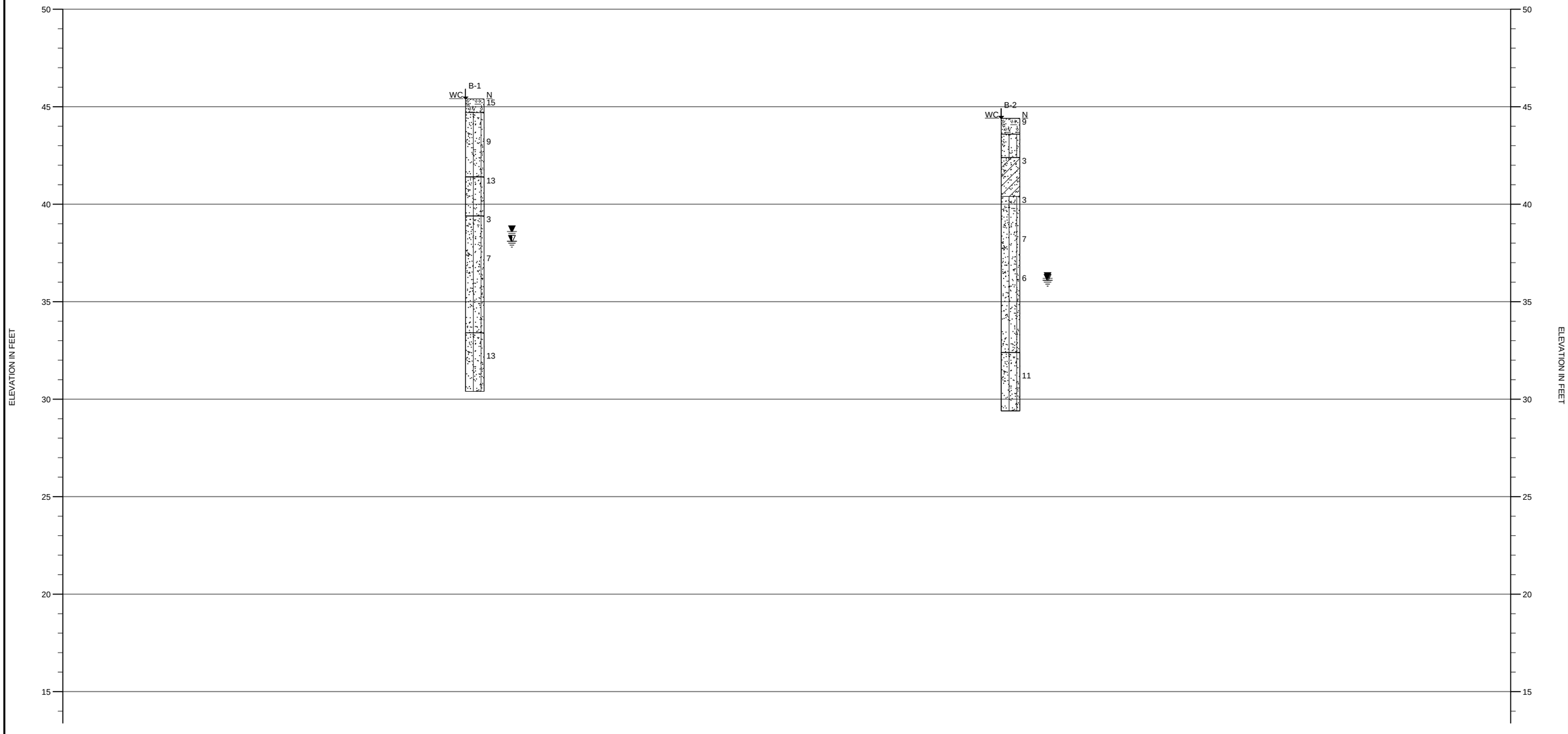
Exploration Location Plan taken from Google Earth and preliminary archetectural design plans titled *Delmarva Christian* prepared by BGW Architects and dated September 12, 2023.

Exploration Location

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
21491 Baltimore Avenue, Unit 1
Georgetown, Delaware 19947
(302) 855-9761

Exploration Location Plan
Delmarva Christian Academy
Georgetown, Delaware

SCALE 11X17	DATE	DRAWN BY	DESIGN BY	REVIEW BY	JOB NO.	Figure
1" ~ 150'	November 2023	GTA	BGW	GRS	31231819	2



Symbol Description

- Topsoil
- SM - Silty Sand
- SP-SM - Poorly Graded Sand with Silt
- SC - Clayey Sand
- Approximate horizontal location of exploration
- Water table during drilling
- Water table at completion
- Water table at 3rd check

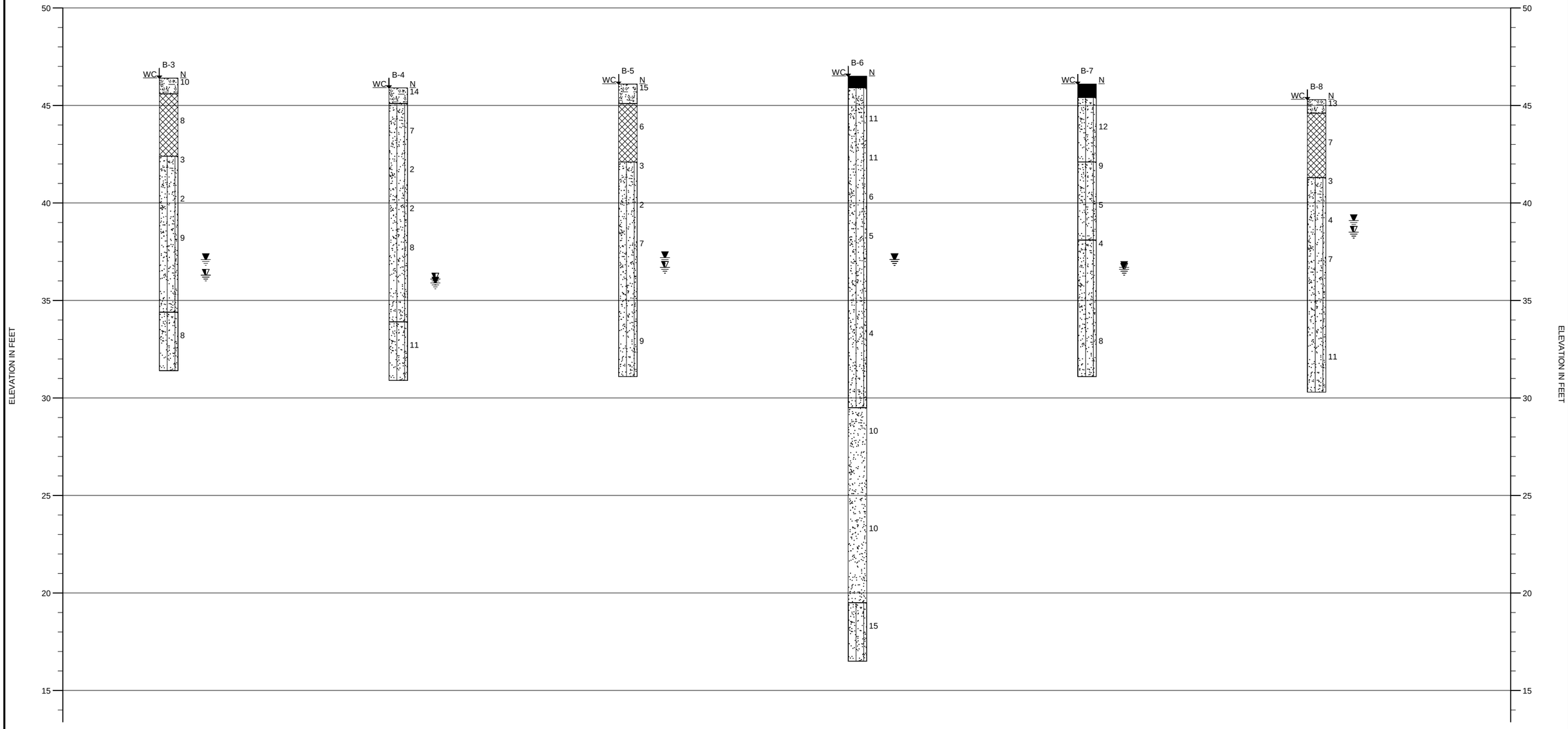
Geo-Technology Associates, Inc.

SUBSURFACE PROFILE

VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023

Delmarva Christian Academy
Georgetown, Delaware

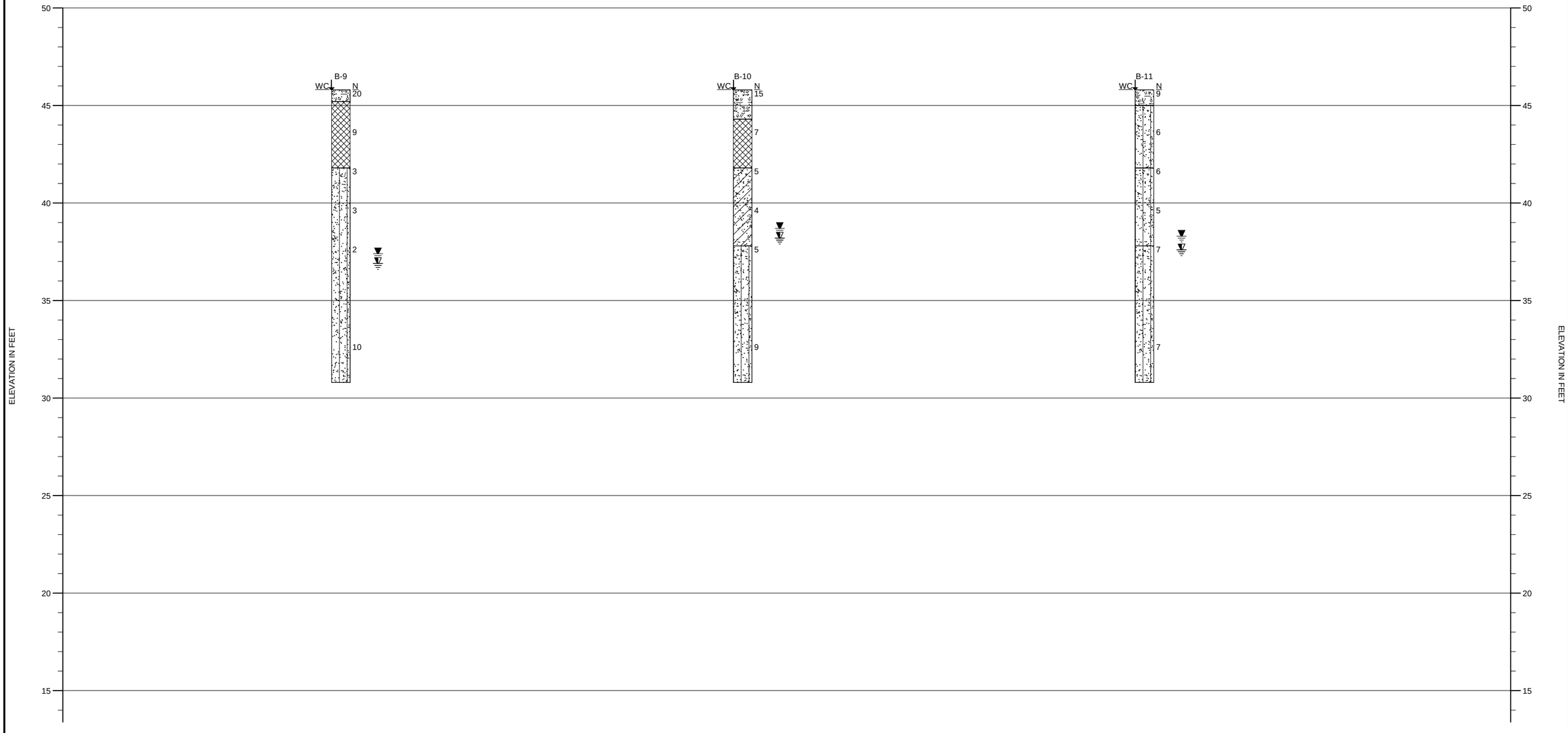
PROJECT NO. 31231819 | FIGURE 3



Symbol Description

- Topsoil
- Existing Fill
- SM - Silty Sand
- SP-SM - Poorly Graded Sand with Silt
- Paving
- SP - Poorly Graded Sand
- Approximate horizontal location of exploration
- Water table during drilling
- Water table at completion
- Water table at 3rd check

Geo-Technology Associates, Inc.			
SUBSURFACE PROFILE			
VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023
Delmarva Christian Academy Georgetown, Delaware			
PROJECT NO. 31231819		FIGURE 4	



Symbol Description

- Topsoil
- Existing Fill
- SM - Silty Sand
- SC - Clayey Sand
- SP-SM - Poorly Graded Sand with Silt
- Approximate horizontal location of exploration
- Water table during drilling
- Water table at completion
- Water table at 3rd check

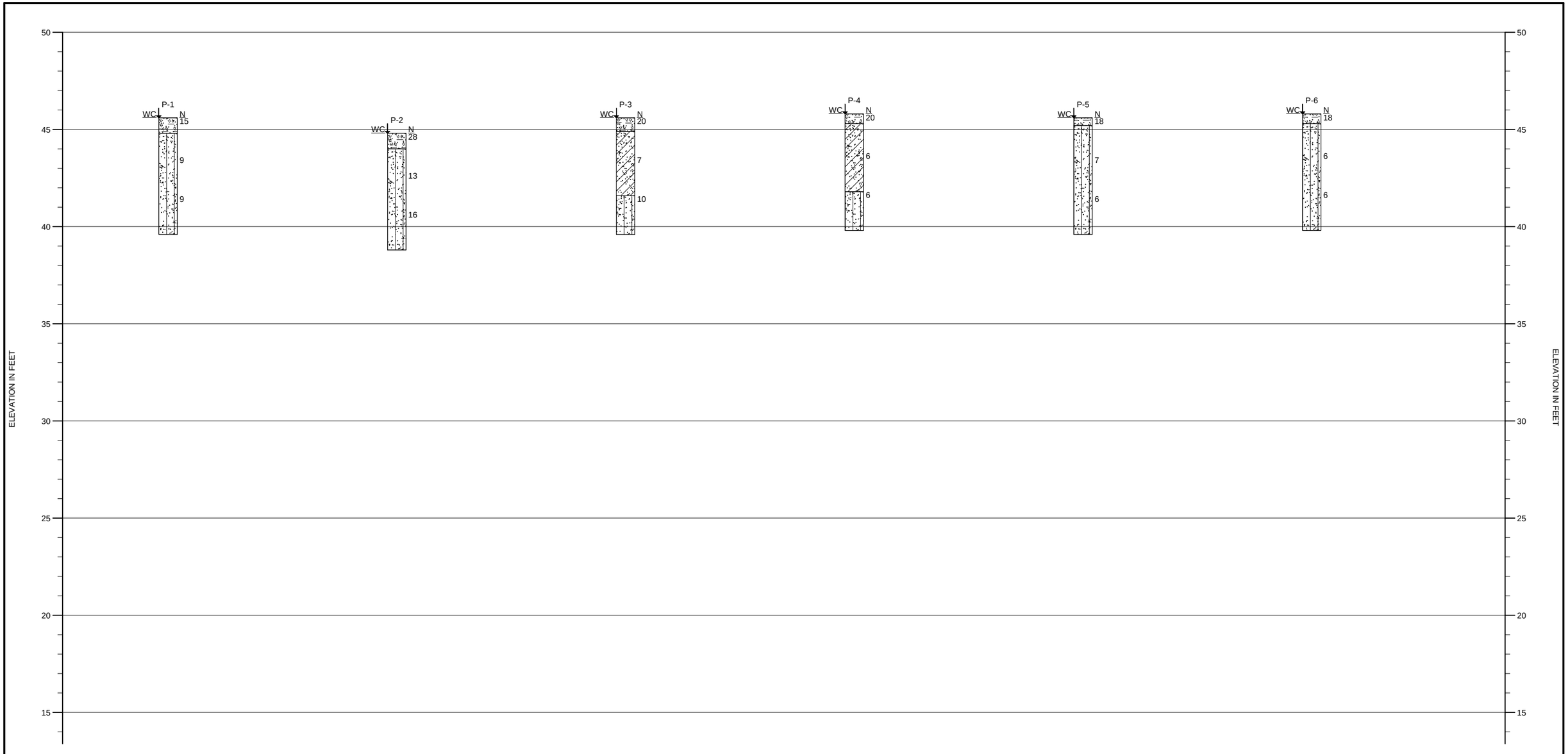
Geo-Technology Associates, Inc.

SUBSURFACE PROFILE

VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023

Delmarva Christian Academy
Georgetown, Delaware

PROJECT NO. 31231819 | FIGURE 5



Symbol Description

- Topsoil
- SM - Silty Sand
- SC - Clayey Sand
- ↓ Approximate horizontal location of exploration

Geo-Technology Associates, Inc.			
SUBSURFACE PROFILE			
VERTICAL SCALE: 1"=5'	DRAWN BY WLG	APPROVED BY TPC	DATE: 11/8/2023
Delmarva Christian Academy Georgetown, Delaware			
PROJECT NO. 31231819			FIGURE 6

APPENDIX B
EXPLORATION DATA

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)				SYMBOLS GRAPHIC	SYMBOLS LETTER
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			GW
					GP
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			GM
					GC
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			SW
					SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			SM
					SC
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILT OR CLAY (<15% RETAINED ON THE NO. 200 SIEVE) SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED ON THE NO. 200 SIEVE) SANDY OR GRAVELLY SILT OR CLAY (>30% RETAINED ON THE NO. 200 SIEVE)	SILTS AND LEAN CLAYS LIQUID LIMIT LESS THAN 50			ML
					CL
					OL
		ELASTIC SILTS AND FAT CLAYS LIQUID LIMIT GREATER THAN 50			MH
					CH
					OH
HIGHLY ORGANIC SOILS					PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS WHICH CONTAIN AN ESTIMATED 5 TO 15% FINES BASED ON VISUAL CLASSIFICATION OR BETWEEN 5 AND 12% FINES BASED ON LABORATORY TESTING; AND FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSS-HATCHED AREA. FINE-GRAINED SOILS ARE CLASSIFIED AS ORGANIC (OL OR OH) WHEN ENOUGH ORGANIC PARTICLES ARE PRESENT TO INFLUENCE ITS PROPERTIES. LABORATORY TEST RESULTS ARE USED TO SUPPLEMENT SOIL CLASSIFICATION BY THE VISUAL-MANUAL PROCEDURES OF ASTM D 2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

	DESCRIPTION		GRAPHIC SYMBOLS
ADDITIONAL DESIGNATIONS	TOPSOIL		
	MAN MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATIONS	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" OF PENETRATION OR LESS, AUGER PENETRABLE	

COARSE-GRAINED SOILS
(GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

FINE-GRAINED SOILS
(SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SOIL SAMPLE	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	▽
UPON COMPLETION OF DRILLING	▼
24 HOURS AFTER COMPLETION	▼

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF BORING NO. B-1

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	7.3		6.8
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **7.3**
GROUND SURFACE ELEVATION: **45.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.4	0	TS		Topsoil: 8 inches	
1	0.0	24	6-7-8-7	15	44.7		SM		Brown-gray, moist, loose to medium dense, Silty SAND	
2	2.0	20	3-4-5-8	9						
3	4.0	24	5-5-8-7	13	41.4		SP-SM		Gray, moist, medium dense, Poorly-graded SAND with Silt	
4	6.0	10	2-2-1-2	3	39.4	6	SM		Gray, moist to wet, very loose to loose, Silty SAND	▽
5	8.0	24	3-4-3-4	7						
					33.4	12	SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
6	13.0	24	7-8-5-4	13	30.4				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. B-1

LOG OF BORING NO. B-2

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.3		8.2
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.3**
GROUND SURFACE ELEVATION: **44.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					44.4	0				
1	0.0	22	4-5-4-4	9	43.6		TS		Topsoil: 10 inches	
							SM		Gray, moist, loose, Silty SAND	
2	2.0	20	3-2-1-2	3	42.4		SC		Gray, moist, very loose, Clayey SAND	
3	4.0	20	2-2-1-2	3	40.4		SM		Gray, moist to wet, very loose to loose, Silty SAND	
4	6.0	18	3-3-4-3	7		6				
5	8.0	24	4-3-3-2	6						
					32.4	12	SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
6	13.0	24	5-6-5-4	11	29.4					
									Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-2

LOG OF BORING NO. B-3

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	10.1		9.3
DATE:	9/7/23		9/8/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **10.1**
GROUND SURFACE ELEVATION: **46.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.4	0				
1	0.0	22	7-5-5-7	10	45.6		TS		Topsoil: 10 inches	
							FILL		Brown, moist, loose, Silty SAND (Fill)	
2	2.0	20	3-4-4-3	8						
					42.4					
3	4.0	20	2-2-1-2	3			SM		Gray-tan, moist to wet, very loose to loose, Silty SAND	
4	6.0	18	1-1-1-2	2		6				
5	8.0	24	4-4-5-4	9						▽
					34.4	12				
							SP-SM		Gray-tan, wet, loose, Poorly-graded SAND with Silt	
6	13.0	20	5-4-4-4	8						
					31.4				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-3

LOG OF BORING NO. B-4

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.8		10.0
DATE:	9/7/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.8**
GROUND SURFACE ELEVATION: **45.9**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	20	6-7-7-6	14	45.9 45.1	0	TS SM		Topsoil: 10 inches Brown-gray, moist to wet, very loose to medium dense, Silty SAND	▽
2	2.0	18	4-3-4-3	7						
3	4.0	20	2-1-1-2	2		6				
4	6.0	18	3-1-1-2	2						
5	8.0	16	3-3-5-4	8						
					33.9	12	SP-SM		Tan, wet, medium dense, Poorly-graded SAND with Silt	
6	13.0	24	4-6-5-3	11						
					30.9				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-4

LOG OF BORING NO. B-5

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.4		8.9
DATE:	9/7/23		9/8/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.4**
GROUND SURFACE ELEVATION: **46.1**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	18	7-7-8-7	15	46.1 45.1	0	TS		Topsoil: 12 inches	
							FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	20	3-3-3-3	6						
					42.1					
3	4.0	18	3-2-1-2	3			SM		Gray-tan, moist to wet, very loose to loose, Silty SAND	
4	6.0	20	2-1-1-2	2		6				
5	8.0	18	3-4-3-3	7						▽
						12				
6	13.0	18	4-5-4-4	9						
					31.1				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-5

LOG OF BORING NO. B-6

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.4		9.4
DATE:	9/12/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/12/2023**
DATE COMPLETED: **9/12/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.4**
GROUND SURFACE ELEVATION: **46.5**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.5	0			Pavement Section: 7 inches	
					45.9		SP-SM		Brown-gray-tan, moist to wet, very loose to medium dense, Poorly-graded SAND with Silt	
1	2.0	12	5-5-6-7	11						
2	4.0	20	2-5-6-6	11		6				
3	6.0	20	3-4-2-2	6						
4	8.0	20	2-3-2-2	5						▽
						12				
5	13.0	24	2-2-2-2	4						
					29.5		SP		Gray, wet, loose, Poorly-graded SAND	
6	18.0	24	3-4-6-6	10		18				
7	23.0	24	3-5-5-4	10		24				
					19.5		SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
8	28.0	24	6-7-8-8	15						
					16.5	30			Bottom of hole 30 feet	
						36				

NOTES:

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LOG OF BORING NO. B-6

LOG OF BORING NO. B-7

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.5		9.4
DATE:	9/12/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/12/2023**
DATE COMPLETED: **9/12/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.5**
GROUND SURFACE ELEVATION: **46.1**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.1	0			Pavement Section: 7 inches	
					45.4		SP-SM		Tan, moist, medium dense, Poorly-graded SAND with Silt	
1	2.0	20	3-5-7-6	12						
					42.1		SM		Gray-tan, moist, loose, Silty SAND	
2	4.0	24	4-4-5-5	9		6				
3	6.0	24	2-3-2-2	5						
					38.1		SP-SM		Gray, moist to wet, very loose to loose, Poorly-graded SAND with Silt	▽
4	8.0	20	3-2-2-2	4		12				
5	13.0	24	3-4-4-5	8						
					31.1				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-7

LOG OF BORING NO. B-8

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	6.8		6.2
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **6.8**
GROUND SURFACE ELEVATION: **45.3**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.3	0	TS		Topsoil: 8 inches	
1	0.0	20	8-7-6-7	13	44.6		FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	22	5-4-3-4	7						
					41.3		SM		Gray-brown, moist to wet, very loose to medium dense, Silty SAND	
3	4.0	18	3-1-2-1	3		6				▽
4	6.0	20	2-3-1-2	4						
5	8.0	22	3-4-3-3	7						
						12				
6	13.0	24	4-5-6-4	11						
					30.3				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-8

LOG OF BORING NO. B-9

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.9		8.4
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.9**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.8	0				
1	0.0	20	7-10-10-7	20	45.2		TS		Topsoil: 7 inches	
							FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	18	3-4-5-4	9						
					41.8					
3	4.0	20	2-1-2-2	3			SM		Gray-brown, moist to wet, very loose to loose, Silty SAND	
4	6.0	18	2-2-1-2	3		6				
5	8.0	24	2-1-1-2	2						▽
						12				
6	13.0	24	4-4-6-4	10						
					30.8				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

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LOG OF BORING NO. B-9

LOG OF BORING NO. B-10

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	7.6		7.1
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **7.6**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	20	7-8-7-7	15	45.8	0	TS		Topsoil: 18 inches	
					44.3		FILL		Brown, moist, loose to medium dense, Silty SAND (Fill)	
2	2.0	22	5-4-3-4	7						
3	4.0	22	2-2-3-2	5	41.8		SC		Gray-brown, moist to wet, very loose to loose, Clayey SAND	
4	6.0	16	2-2-2-2	4		6				▽
5	8.0	20	2-3-2-2	5	37.8		SM		Tan-gray, wet, loose, Silty SAND	
						12				
6	13.0	24	4-5-4-4	9						
					30.8				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
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LOG OF BORING NO. B-10

LOG OF BORING NO. B-11

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.2		7.5
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.2**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	3-4-5-4	9	45.8	0	TS		Topsoil: 10 inches	
					45.0		SM		Brown-gray, moist, loose, Silty SAND	
2	2.0	24	2-3-3-2	6						
					41.8		SP-SM		Gray, moist, loose, Poorly-graded SAND with Silt	
3	4.0	18	3-3-3-3	6		6				
4	6.0	22	3-3-2-3	5						▽
					37.8		SM		Gray, moist to wet, loose, Silty SAND	
5	8.0	24	3-3-4-3	7						
						12				
6	13.0	24	5-4-3-5	7						
					30.8				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
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LOG OF BORING NO. B-11

LOG OF BORING NO. B-12

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	9.2		9.0
DATE:	9/12/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/12/2023**
DATE COMPLETED: **9/12/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **9.2**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	14	3-3-4-3	7	45.6 44.9	0	TS SM		Topsoil: 8 inches Brown, moist, loose, Silty SAND	
2	2.0	20	4-3-3-2	6	43.6		SP-SM		Gray-tan, moist to wet, very loose to loose, Poorly-graded SAND with Silt	
3	4.0	20	2-1-2-2	3		6				
4	6.0	24	2-3-2-3	5						
5	8.0	24	1-2-2-1	4						▽
						12				
6	13.0	20	1-1-3-4	4						
						18				
7	18.0	24	2-2-4-5	6						
					23.6		SP		Gray, wet, medium dense, Poorly-graded SAND	
8	23.0	24	6-8-6-6	14		24				
					18.6		SP-SM		Gray, wet, medium dense, Poorly-graded SAND with Silt	
9	28.0	24	5-9-7-7	16						
					15.6	30			Bottom of hole 30 feet	
						36				

NOTES:

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LOG OF BORING NO. B-12

LOG OF BORING NO. B-13

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	8.5		7.8
DATE:	9/7/23		9/8/23
CAVED (ft):	-		-

DATE STARTED: **9/7/2023**
DATE COMPLETED: **9/7/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.5**
GROUND SURFACE ELEVATION: **46.3**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.3	0				
1	0.0	20	4-6-6-5	12	45.5		TS		Topsoil: 10 inches	
							SM		Brown-gray, moist to wet, loose to medium dense, Silty SAND	▽
2	2.0	18	4-4-5-6	9						
3	4.0	20	3-3-4-3	7		6				
4	6.0	18	2-2-3-2	5						
5	8.0	20	3-5-3-3	8						
					34.3	12	SP-SM		Tan, wet, loose, Poorly-graded SAND with Silt	
6	13.0	24	6-5-4-4	9						
					31.3				Bottom of hole 15 feet	
						18				
						24				
						30				
						36				

NOTES:

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. B-13

LOG OF BORING NO. P-1

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	7-7-8-7	15	45.6 44.8	0	TS SM		Topsoil: 10 inches Brown-gray, moist, loose to medium dense, Silty SAND AASHTO: A-2	
2	2.0	18	4-4-5-4	9						
3	4.0	20	5-4-5-8	9						
					39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-1

LOG OF BORING NO. P-2

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **44.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	15-20-8-7	28	44.8 44.0	0	TS SM		Topsoil: 10 inches Brown-gray, moist, medium dense, Silty SAND AASHTO: A-2	
2	2.0	20	6-5-8-7	13						
3	4.0	24	7-7-9-8	16						
					38.8	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-2

LOG OF BORING NO. P-3

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/11/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/11/2023**
DATE COMPLETED: **9/11/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.6	0	TS		Topsoil: 8 inches	
1	0.0	24	10-14-6-6	20	44.9		SC		Brown, moist, loose to medium dense, Clayey SAND AASHTO: A-4(1)	
2	2.0	24	6-4-3-7	7						
					41.6		SM		Gray, moist, loose, Silty SAND AASHTO: A-2	
3	4.0	24	8-5-5-4	10	39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-4

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	4-10-10-7	20	45.8 45.3	0	TS SC		Topsoil: 6 inches Gray-brown, moist, loose to medium dense, Clayey SAND AASHTO: A-4(1)	
2	2.0	24	3-3-3-3	6						
3	4.0	24	2-3-3-2	6	41.8 39.8	6	SM		Gray, moist, loose, Silty SAND AASHTO: A-2	
									Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-4

LOG OF BORING NO. P-5

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	5-9-9-8	18	45.6 45.2	0	TS SM		Topsoil: 5 inches Brown-gray, moist, loose to medium dense, Silty SAND AASHTO: A-2	
2	2.0	24	3-3-4-4	7						
3	4.0	24	3-3-3-2	6						
					39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-5

LOG OF BORING NO. P-6

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.8**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	24	4-8-10-11	18	45.8 45.3	0	TS SM		Topsoil: 6 inches Brown-gray, moist, loose to medium dense, Silty SAND AASHTO: A-2	
2	2.0	24	4-3-3-4	6						
3	4.0	24	3-3-3-3	6						
					39.8	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-6

LOG OF BORING NO. P-7

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/6/23		9/7/23
CAVED (ft):	-		-

DATE STARTED: **9/6/2023**
DATE COMPLETED: **9/6/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽: **NE**
GROUND SURFACE ELEVATION: **45.6**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					45.6	0				
1	0.0	22	3-3-4-3	7	44.6		TS		Topsoil: 12 inches	
							SM		Brown-gray, moist, loose, Silty SAND AASHTO: A-2	
2	2.0	18	2-3-4-2	7						
3	4.0	20	3-3-4-3	7						
					39.6	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-8

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/8/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/8/2023**
DATE COMPLETED: **9/8/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **46.4**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					46.4	0				
1	0.0	20	3-4-3-6	7	45.4		TS		Topsoil: 12 inches	
							SM		Brown-tan, moist, loose, Silty SAND AASHTO: A-2	
2	2.0	18	4-4-3-4	7						
3	4.0	16	2-2-3-2	5						
					40.4	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-8

LOG OF BORING NO. P-9

PROJECT: **Delmarva Christian Academy**
PROJECT NO.: **31231819**
PROJECT LOCATION: **Georgetown, Delaware**

WATER LEVEL (ft):	Dry 6		Dry 6
DATE:	9/8/23		9/14/23
CAVED (ft):	-		-

DATE STARTED: **9/8/2023**
DATE COMPLETED: **9/8/2023**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **J. Swift**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **NE**
GROUND SURFACE ELEVATION: **46.7**
DATUM: **Survey**
EQUIPMENT: **Geoprobe 7822DT**
LOGGED BY: **NO**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
1	0.0	22	3-4-6-7	10	46.7 45.9	0	TS SM		Topsoil: 10 inches Brown-gray, moist, loose, Silty SAND AASHTO: A-2	
2	2.0	20	4-5-4-3	9						
3	4.0	18	3-3-2-1	5						
					40.7	6			Bottom of hole 6 feet	
						12				
						18				
						24				
						30				
						36				

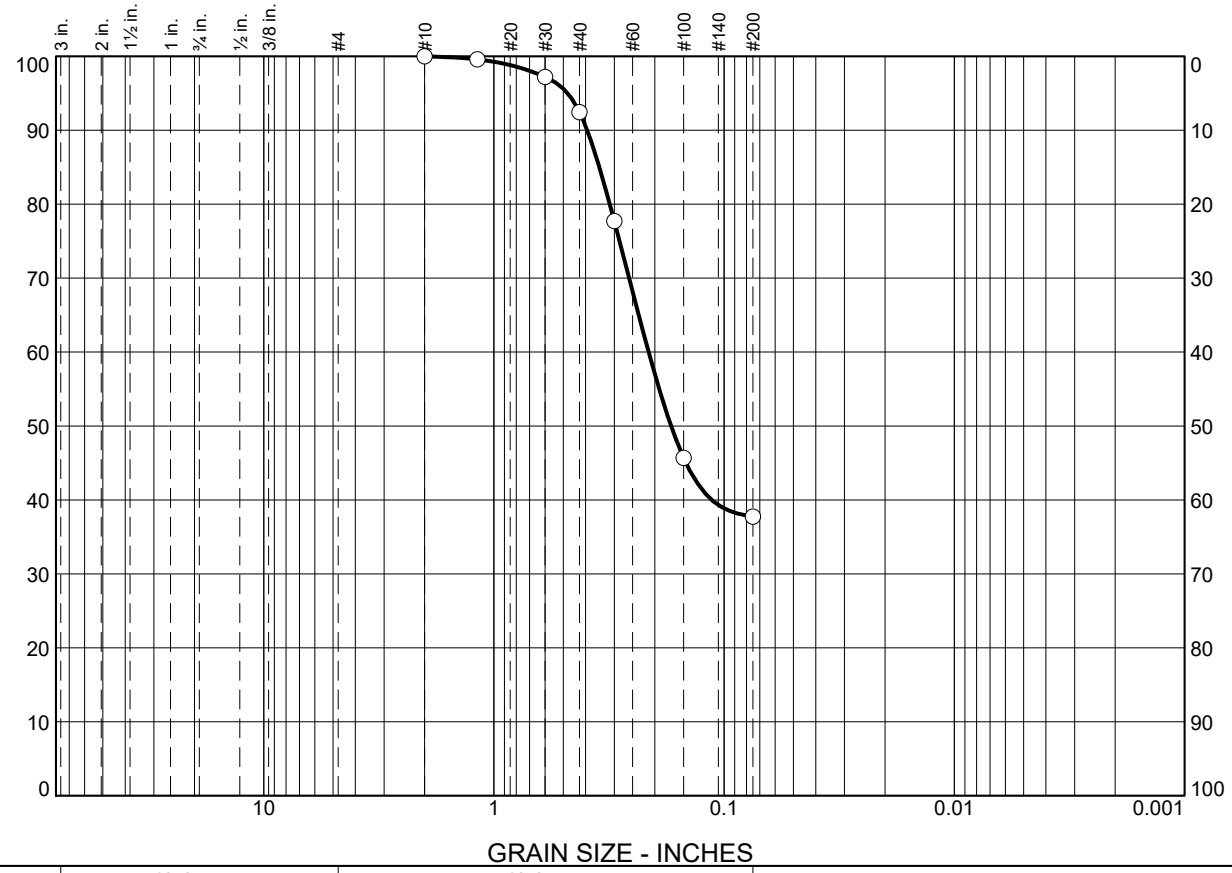
NOTES: **NE = Not Encountered**

GEO-TECHNOLOGY ASSOCIATES, INC.
21491 Baltimore Avenue, Suite 1
Georgetown, DE 19947

LOG OF BORING NO. P-9

APPENDIX C
LABORATORY DATA

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.0	7.5	54.7	37.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.6		
#30	97.2		
#40	92.5		
#50	77.7		
#100	45.7		
#200	37.8		

* (no specification provided)

Soil Description

Gray, Clayey SAND

Atterberg Limits

PL= 14 LL= 23 PI= 9 NM= 18.5

Coefficients

D_{90}= 0.3936 D_{85}= 0.3483 D_{60}= 0.2128
D_{50}= 0.1700 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(0)

Remarks

Pocket Penetrometer Read: 0.50 tsf

Source of Sample: B-2 **Depth:** 2.0-4.0 feet
Sample Number: S-2

Date: 9/11/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

Client: Delmarva Christian School
Project: Delmarva Christian Academy

Project No: 31231819 **Figure**

Tested By: E. Sammler **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.3	3.8	62.3	33.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.7		
#16	99.3		
#30	98.1		
#40	95.9		
#50	92.3		
#100	57.4		
#200	33.6		

* (no specification provided)

Soil Description

Gray-brown, Clayey SAND

Atterberg Limits

PL= 17 LL= 30 PI= 13 NM= 25.5

Coefficients

D_{90}= 0.2784 D_{85}= 0.2470 D_{60}= 0.1576
D_{50}= 0.1274 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-2-6(1)

Remarks

Pocket Penetrometer Read: 0.25 tsf

Source of Sample: B-10 **Depth:** 6.0-8.0 feet
Sample Number: S-4 **Date:** 9/6/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

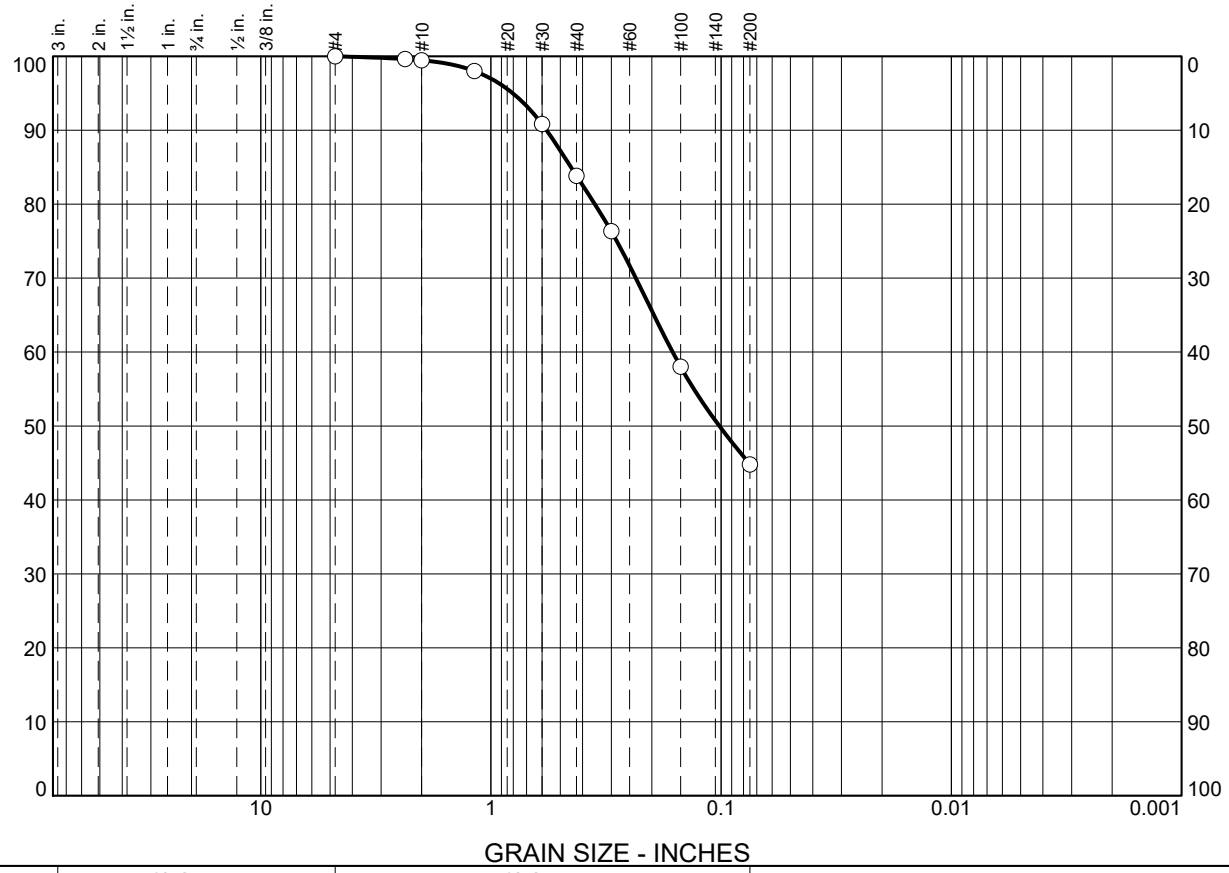
Client: Delmarva Christian School
Project: Delmarva Christian Academy

Project No: 31231819 **Figure**

Tested By: E. Sammler **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.5	15.7	39.0	44.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.6		
#10	99.5		
#16	98.0		
#30	90.8		
#40	83.8		
#50	76.3		
#100	58.0		
#200	44.8		

* (no specification provided)

Soil Description

Gray brown, Clayey SAND

Atterberg Limits

PL= 16 LL= 26 PI= 10 NM= 8.7

Coefficients

D_{90}= 0.5731 D_{85}= 0.4491 D_{60}= 0.1625
D_{50}= 0.1018 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO= A-4(1)

Remarks

Source of Sample: P-4 **Depth:** 1.0-4.0 feet
Sample Number: S-09062023-01 **Date:** 9/6/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

Client: Delmarva Christian School
Project: Delmarva Christian Academy

Project No: 31231819 **Figure**

Tested By: J. Maynard **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

MOISTURE-DENSITY RELATIONSHIP TEST REPORT
ASTM D 1557 Method B Modified

Project No.: 31231819 **Date:** 9/6/2023

Project: Delmarva Christian Academy

Client: Delmarva Christian School

Source of Sample: P-4 **Depth:** 1.0-4.0 feet

Sample Number: S-09062023-01

Remarks:

MATERIAL DESCRIPTION

Description: Gray brown, Clayey SAND

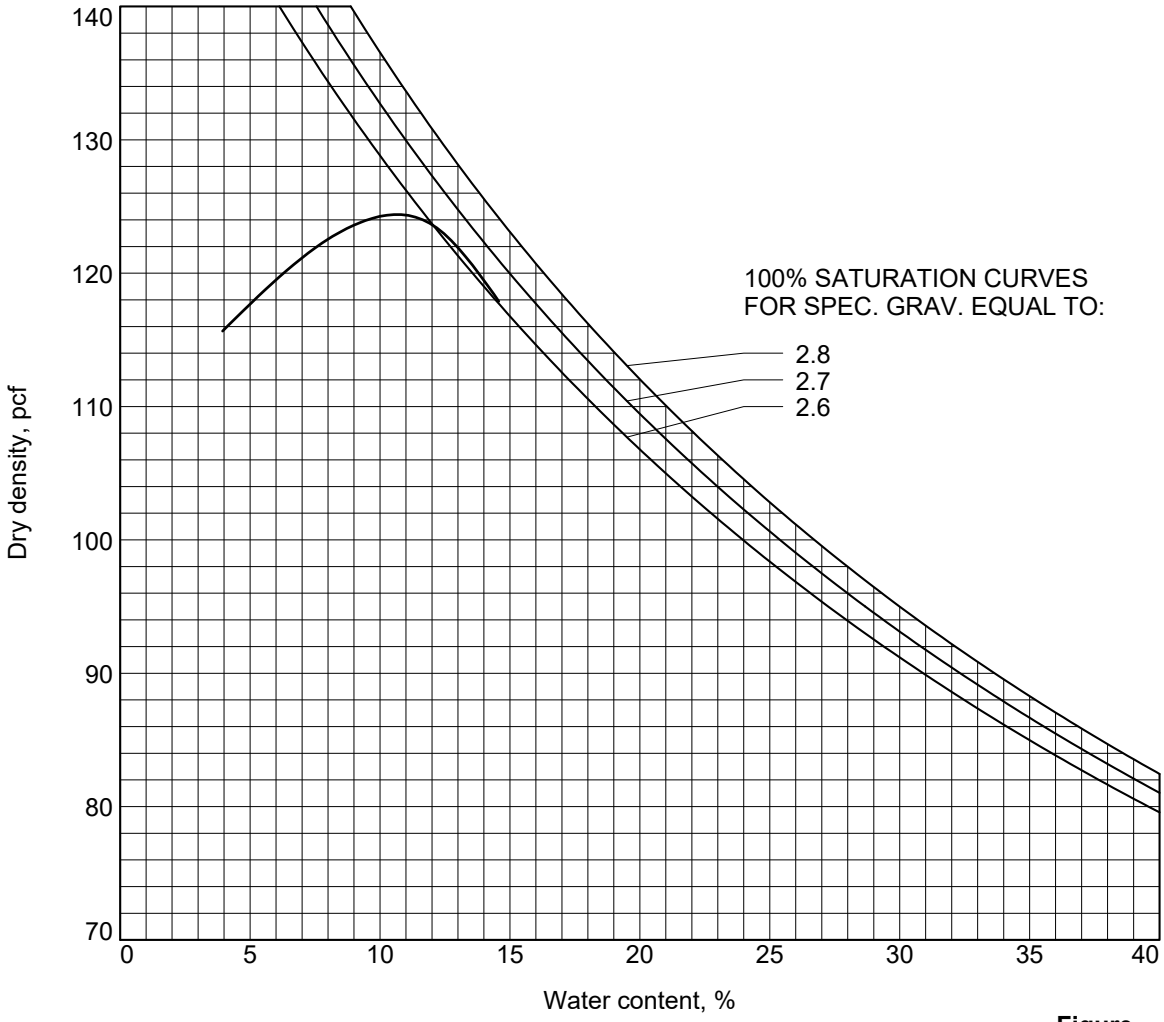
Classifications - **USCS:** SC **AASHTO:** A-4(1)

Nat. Moist. = 8.7 % **Sp.G. =** 2.6A

Liquid Limit = 26 **Plasticity Index =** 10

% < No.200 = 44.8 %

TEST RESULTS
Maximum dry density = 124.4 pcf
Optimum moisture = 10.7 %



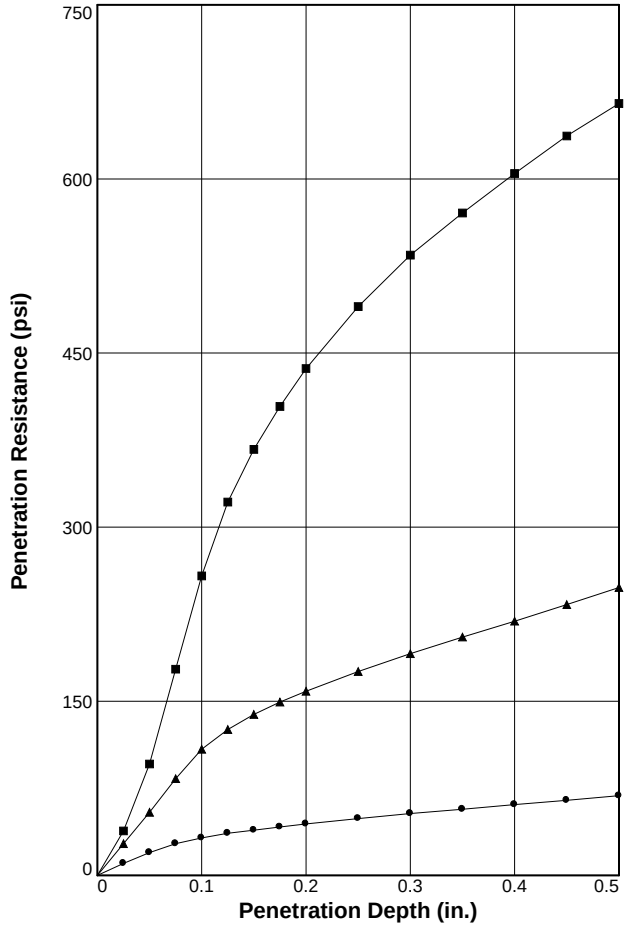
Figure

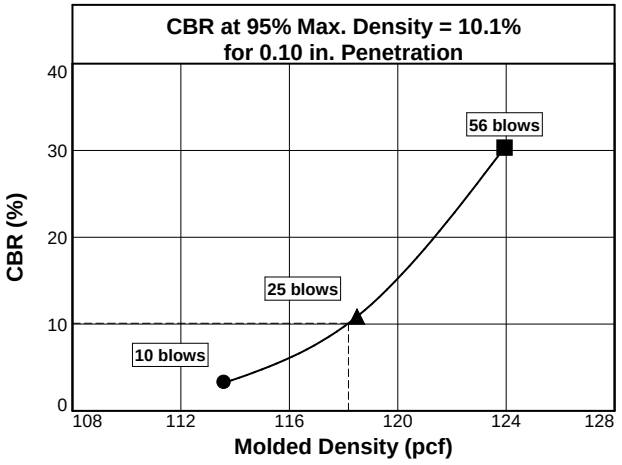
Geo-Technology Associates, Inc.

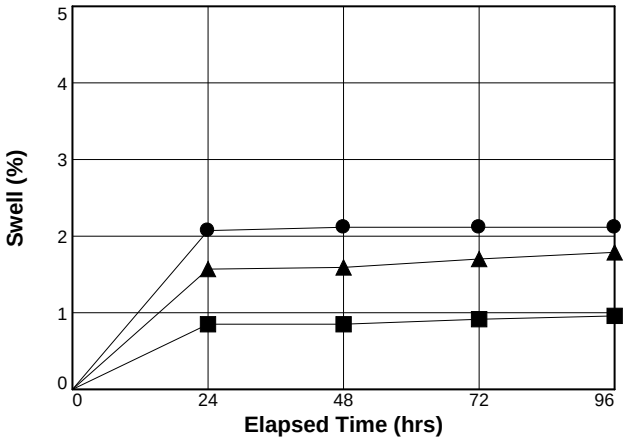
Tested By: D. Hearn **Checked By:** G. Sauter

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318

BEARING RATIO TEST REPORT
ASTM D1883-14







	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	113.6	91.3	10.0	111.3	89.4	18.8	3.2	3.0	0.000	10	2.1
2 △	118.5	95.3	10.3	116.4	93.6	16.3	10.9	10.6	0.000	10	1.8
3 □	123.9	99.6	9.4	122.8	98.7	14.3	30.3	30.4	0.018	10	1

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Gray brown, Clayey SAND	SC	124.4	10.7	26	10

Project No: 31231819

Project: Delmarva Christian Academy

Source of Sample: P-4 **Depth:** 1.0-4.0 feet

Sample Number: S-09062023-01

Date: 9/6/2023

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

Test Description/Remarks:

AASHTO Classification: A-4(1)

Figure _____

ASTM specifications performed may include C136, D421, D422, D1140, D6913, D2216, D2217, and D4318